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### 2019-2020 ACADEMIC CALENDAR

#### Undergraduate/Graduate

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**College of Professional and Continuing Education**

**Fall 2019**

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</tr>
<tr>
<td>Last Day to Withdraw from 1st 7-week class with 'W' Grade</td>
<td>Monday</td>
<td>10-Feb-2020</td>
</tr>
<tr>
<td>Presidents Day Holiday – No On-Campus Classes</td>
<td>Monday</td>
<td>17-Feb-2020</td>
</tr>
</tbody>
</table>

**Spring 2020**

<table>
<thead>
<tr>
<th>Item</th>
<th>Day</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Days</td>
<td>Monday &amp; Tuesday</td>
<td>6-Jan-2020 &amp; 7-Jan-2020</td>
</tr>
<tr>
<td>Classes Begin – 15-week and 1st 7-week classes</td>
<td>Tuesday</td>
<td>7-Jan-2020</td>
</tr>
<tr>
<td>Last Day of Drop/Add for 15-week &amp; 1st 7-week classes</td>
<td>Tuesday</td>
<td>14-Jan-2020</td>
</tr>
<tr>
<td>MLK Holiday - No Classes</td>
<td>Monday</td>
<td>20-Jan-2020</td>
</tr>
<tr>
<td>Census</td>
<td>Friday</td>
<td>7-Feb-2020</td>
</tr>
<tr>
<td>Last Day to Withdraw from 1st 7-week class with 'W' Grade</td>
<td>Monday</td>
<td>10-Feb-2020</td>
</tr>
<tr>
<td>Presidents Day Holiday – No On-Campus Classes</td>
<td>Monday</td>
<td>17-Feb-2020</td>
</tr>
<tr>
<td>Item</td>
<td>Day</td>
<td>Date</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>Midterm Grades Due from Faculty - 3 pm (15-week classes)</td>
<td>Tuesday</td>
<td>18-Feb-2020</td>
</tr>
<tr>
<td>Midterm Grades Available on LeopardWeb - 9 am</td>
<td>Wednesday</td>
<td>19-Feb-2020</td>
</tr>
<tr>
<td>End of 1st 7-week class</td>
<td>Monday</td>
<td>24-Feb-2020</td>
</tr>
<tr>
<td>Final Grades Due from Faculty - 12 pm (7-week classes)</td>
<td>Wednesday</td>
<td>26-Feb-2020</td>
</tr>
<tr>
<td>Final Grades Post to LeopardWeb - 9am</td>
<td>Friday</td>
<td>28-Feb-2020</td>
</tr>
</tbody>
</table>
| BREAK in between 7-week classes                                     | Tuesday - Monday 25-Feb-2020 to 2-Mar-2020  
| Start of 2nd 7-week class                                           | Tuesday    | 3-Mar-2020  
| Last Day of Drop/Add for 2nd 7-week class                          | Tuesday    | 10-Mar-2020  
| Last Day to Withdraw from Class with 'W' Grade for 15-week class    | Friday     | 3-Apr-2020  
| Last Day of Classes for 15-week & 2nd 7-week classes               | Saturday   | 18-Apr-2020  
| Patriot's Day Holiday - No On-Campus Classes                       | Monday     | 20-Apr-2020  
| Commencement                                                       | Saturday   | 25-Apr-2020  
| Final Grades Due from Faculty - 12pm (15-week & 2nd 7-week classes)| Monday     | 27-Apr-2020  
| Final Grades Post to LeopardWeb - 9am                              | Wednesday  | 29-Apr-2020  

**Summer 2020**

<table>
<thead>
<tr>
<th>Item</th>
<th>Day</th>
<th>Date</th>
</tr>
</thead>
</table>
| Faculty Day                                                         | Tuesday    | 5-May-2020  
| Classes Begin – 15-week & 1st 7-week classes                       | Tuesday    | 5-May-2020  
| Last Day of Drop/Add - 15-week & 1st 7-week classes               | Tuesday    | 12-May-2020  
| Memorial Day Holiday - No On-Campus Classes                       | Monday     | 25-May-2020  
| Last Day to Withdraw from Class with 'W' grade for 1st 7-week class| Tuesday    | 2-Jun-2020  
| Census                                                             | Friday     | 5-Jun-2020   
| End of 1st 7-week Class                                            | Monday     | 22-Jun-2020  
| Final Grades Due from Faculty - 12 PM (1st 7-week classes)        | Tuesday    | 23-Jun-2020  
| Start of 2nd 7-week Class                                          | Tuesday    | 23-Jun-2020  
| Final Grades Post to LeopardWeb-9am (1st 7-week classes)          | Wednesday  | 24-Jun-2020  
| Last Day of Drop/Add 2nd 7-week classes                            | Tuesday    | 30-Jun-2020  
| July 4th Recess - No Classes 15-week session                      | Wednesday  | 1-Jul-2020 to 4-Jul-2020  
| July 4th Recess for 2nd 7-week classes                             | Tuesday - Monday | 30-Jun-2020 to 6-Jul-2020  

**Item** | **Day** | **Date**
--- | --- | ---
Last Day to Withdraw from Class with 'W' grade for 15-week class | Tuesday | 21-Jul-2020
Last Day to Withdraw from Class with 'W' grade for 2nd 7-week class | Tuesday | 28-Jul-2020
Last Day of Classes for 15-week & 2nd 7-week classes | Saturday | 15-Aug-2020
Commencement | Sunday | 16-Aug-2020
Final Grades Due from Faculty - 12pm (15-week & 2nd 7-week classes) | Monday | 17-Aug-2020
Final Grades Available on LeopardWeb to Students - 9am | Wednesday | 19-Aug-2020
ABOUT WENTWORTH

The University

For more than a century, Wentworth Institute of Technology has delivered a first-rate education to prepare graduates for rewarding careers. While educating its students to work with industry-standard technology, Wentworth has always employed the best practices in education: you learn something best by doing and close faculty mentorship. Wentworth is a nationally recognized, private, coeducational University offering master’s, bachelor’s, and associate degrees, in addition to certificate programs, to more than 3,900 full-time students each year. More than 50,000 students—who have assumed leadership roles in a multitude of professions in industry, education, and government—have graduated since Wentworth opened its doors in 1911.

At Wentworth, we are dedicated to the “Five Factors of Career Success,” which include focused academics, cooperative education, innovation and entrepreneurship, collaboration and partnerships, and ideal location. Our students are adept at collaborating with others, and they graduate from Wentworth with the ability to lead with confidence and contribute to society in meaningful ways.

Wentworth consists of four colleges: the College of Architecture, Design and Construction Management; the College of Arts and Sciences; the College of Engineering and Computer Science; and the College of Professional and Continuing Education.

Wentworth offers bachelor’s degrees in twenty-two (22) majors:

- Applied Mathematics
- Applied Science
- Architecture
- Biological Engineering
- Biomedical Engineering
- Building Construction Management
- Business Management
- Civil Engineering
- Computer Engineering
- Computer Information Systems
- Computer Networking
- Computer Science
- Construction Management
- Cybersecurity
- Electrical Engineering
- Electromechanical Engineering
- Engineering
- Facility Planning & Management
- Industrial Design
- Interior Design
- Mechanical Engineering
- Project Management

Wentworth offers seven (7) master’s degree programs:

- Master of Science in Applied Computer Science
- Master of Architecture
- Master of Engineering in Civil Engineering
- Master of Science in Technology Management
- Master of Science in Construction Management
- Master of Science in Facility Management
- Master of Science in Project Management

Wentworth offers twenty-two (22) minors

Wentworth offers four (4) professional undergraduate certificates (CPCE only)

The University fields eighteen (18) NCAA Division III varsity athletic teams. The average class size is 20, and students currently hail from 38 different states and 60 countries.

As a fundamental part of a Wentworth education, students are required to complete two cooperative (co-op) education semesters with an option for a third. Co-op experiences can take place anywhere in the world and are always related to the career major of the student, preparing them for postgraduate work or further study.

Wentworth co-op students and graduates are sought after for their demonstrated abilities to quickly become productive members in the workplace, for their technical problem-solving skills, and for their educational preparation to adapt to changing technologies. More than 58% of Wentworth students are offered postgraduate, full-time employment by their co-op employers.

A part-time class schedule is also available through the College of Professional and Continuing Education (CPCE). CPCE offers evening, weekend, and online courses and programs for working adults who wish to complete their undergraduate degrees, supplement their skills, or earn a graduate degree. Wentworth’s practical orientation has made these programs particularly attractive to current employees who want to develop the updated skills necessary to advance professionally.

Wentworth’s 31-acre campus on Huntington Avenue in the Fenway section of Boston is located near the Museum of Fine Arts, the Isabella Stewart Gardner Museum, Symphony Hall and Fenway Park. Wentworth is a member of the Colleges of the Fenway consortium, which also includes Emmanuel College, Massachusetts College of Art and Design, Massachusetts College of Pharmacy and Health Sciences, and Simmons College.

The Institute was founded in 1904 through a bequest from Arioch Wentworth, a Boston merchant, and held its first classes in 1911.

Mission, Vision, and Values

Mission

Wentworth’s core mission is to empower, inspire, and innovate through experiential learning.

Vision

Wentworth envisions a future in which it is nationally recognized as the University of choice for externally collaborative, project-based, interdisciplinary learning.

Wentworth’s Fundamental Values

At Wentworth, our core values reflect that we are student-centered, that we are passionate for hands-on teaching and learning, and that innovation and creativity are at the center of what we do. We express these three core values as “Students first,” “The world is our classroom,” and “Thinking without a box.”
Colleges of the Fenway

The City of Boston, an international center of learning with its many colleges and universities, museums, conservatories and art institutions, provides exciting opportunities for institutional cooperation, enhancing curricular choices for students. Wentworth takes a leading position in developing meaningful academic programming with area institutions.

Wentworth Institute of Technology is one of five colleges forming the Colleges of the Fenway. This collaboration with the Massachusetts College of Art and Design, Massachusetts College of Pharmacy and Health Sciences, Emmanuel College, and Simmons College expands academic opportunities and choices through cross-registration, and enhances the student and faculty environments of the individual institutions while retaining the unique and special qualities of each of the five colleges.

The Wentworth Model

In order to fulfill its mission and to prepare students for the world in which they will live, Wentworth has established the following general education learning outcomes as the institution’s definition of an educated person.

After completing their general education curriculum, students will be able to demonstrate competence in:

1. Written, oral, and visual communication
2. Problem solving
3. Information literacy skills
4. Applications of ethics to decision-making
5. Logical thinking and scientific and quantitative reasoning
6. Critical analysis of scientific, historical, and social phenomena and aesthetic dimensions of humankind

In order to fulfill its mission, Wentworth has established the following Undergraduate Student Learning Outcomes. These learning outcomes are reinforced in classrooms, laboratories, studios, cooperative education experiences, and co-curricular opportunities. All alumni of Wentworth undergraduate programs will demonstrate proficiency in:

1. Written, oral, and visual communication
2. Problem solving
3. The use of current technological tools
4. Making connections between disciplines and contexts
5. A range of effective teamwork skills
6. Critical thinking
7. Personal and social responsibility

In order to fulfill its mission, Wentworth has established the following Graduate Student Learning Outcomes. Upon graduation, Wentworth Institute of Technology graduate students will demonstrate:

1. Core Knowledge: advanced knowledge in a specialized area consistent with the focus of their graduate program, including critical thinking and problem solving.
2. Scholarly Communication: advanced proficiency in written and oral communication, appropriate to purpose and audience.
3. Professionalism: advanced intellectual and organizational skills of professional practice, including ethical conduct.
4. Research Methods and Analysis: quantitative and qualitative skills in the use of data gathering methods and analytical techniques used in typical research that is consistent with the focus of their graduate program.

Undergraduate and Graduate Program Curricula

Wentworth’s curricula have been structured to:

- Allow students to enter a baccalaureate degree program directly from high school
- Allow transfer from another institution of higher learning with the possibility of receiving advanced-standing credit

At the end of their sophomore year, baccalaureate students have the opportunity to participate in Wentworth’s optional pre-cooperative work semester prior to entering their junior year. The cooperative education model, in which students complete two co-op work semesters along with their academic degree requirements, is both a University tradition and a graduation requirement.

To ensure that the student learning outcomes are being achieved, the University’s undergraduate curricula incorporates a core of general studies. Baccalaureate students are required to take, at minimum, one course in basic mathematics, one laboratory science course, a minimum of 28 credits in Humanities and Social Sciences (with at least one in Humanities and one in Social Sciences), an English Sequence, an introduction to major/profession seminar, and a capstone requirement. Several course offerings, including the capstone requirement, independent study, directed study, and design and project courses, provide opportunities to senior and fifth-year students to demonstrate competency in innovative problem-solving situations, and proficiency in analytical writing and presentation skills. Team and/or interdisciplinary projects, with clearly defined individual responsibilities, are encouraged.

Within this framework the baccalaureate curricular structure for four- and five-year programs mandates that courses will not exceed five (5) per semester and will be at least 12 credits, but no more than 20 credits, per semester. Graduate curricular structure (M.Arch) is a full-time program offered in one, two, or three-year length of study dependent upon type of baccalaureate degree earned. Academic credit will be based on the 15-week format, with one hour of lecture or recitation equal to one (1) credit and two (2) hours of laboratory or studio work equal to one (1) credit.

College of Professional and Continuing Education

The part-time curriculum model for the College of Professional and Continuing Education (CPCE) is structured to provide:

- Access directly into either an associate, bachelor’s, or master’s program based on the student’s previous academic preparation and educational goals
- Access to preparatory courses prior to beginning an academic degree program
- Learning opportunities that are convenient and appropriate for adult learners who are currently working and seeking career advancement through education and/or training
- Support for student learning through our academic advising, Center for Academic Excellence, and student support services

To ensure that learning outcomes are achieved, the University has developed a curricular structure that incorporates a core of general
studies. In accordance with these general study guidelines, students are required to take, at minimum for an associate degree, two (2) mathematics courses, one (1) laboratory science course, one (1) computer literacy course, two (2) communication courses, one (1) humanities or social science elective, and ten (10) prescribed courses related to their discipline.

To receive a baccalaureate degree, in addition to completing the associate degree requirements, students must complete, at the baccalaureate level, one (1) mathematics course, one (1) course in professional communication, three (3) courses in the area of humanities and social sciences, one (1) general elective course, one (1) course in professional practice, nine (9) prescribed courses related to their discipline, and a capstone course. This capstone requirement for graduating seniors provides an opportunity to demonstrate competency in problem-solving situations, proficiency in analytical writing, and presentation skills. Team and/or interdisciplinary projects, with clearly defined individual responsibilities, are encouraged.

Within this framework of general studies, the curricular structure has been designed to permit students to take two courses per semester, in either the seven-week term format or the traditional 15-week semester. Both formats enable students to complete their graduation requirements as their schedule permits. Academic credit will be based on the credit award for each course.

Wentworth Institute of Technology offers baccalaureate degrees in the following disciplines:

**College of Arts and Sciences**
- Applied Mathematics (BSAM)
- Applied Science (BSAS)
- Business Management (BSM)
- Computer Information Systems (BSIS)

**College of Architecture, Design, and Construction Management**
- Architecture (BSA)
- Construction Management (BSCM)
- Industrial Design (BIND)
- Interior Design (BINT)

**College of Engineering and Computer Science**
- Biological Engineering (BSBE)
- Biomedical Engineering (BBME)
- Civil Engineering (BSCE)
- Computer Engineering (BSCE)
- Computer Networking (BSCN)
- Computer Science (BCOS)
- Cybersecurity (BCSY)
- Electrical Engineering (BSEE)
- Electromechanical Engineering (BELM)
- Engineering (BSEN)
- Mechanical Engineering (BSME)

**Minors**
Minors are offered in:
- Aerospace Engineering
- Applied Math
- Architectural Studies
- Bioinformatics
- Biology
- Business Analytics
- Business Management
- Chemistry
- Civil Engineering
- Computer Networking
- Computer Science
- Construction Management
- Cybersecurity Management
- Data Science
- Electrical Engineering
- Environmental Engineering
- Financial Mathematics
- Manufacturing
- Media, Culture, and Communication Studies
- Performing Arts (through COF)
-Physics
- Surveying

**College of Professional and Continuing Education**

**Associate in Applied Science (A.A.S.)**
- Building Construction Management (ABCM)
- Engineering Technology (AENT)

**Bachelor of Science (B.S.)**
- Building Construction Management (BBCM)
- Facility Management (BSFM)
- Project Management (BPM)

**Professional Certificates - Undergraduate**
- Facilities Management (CPFM)
- Managing Construction Projects (CMCP)
- Professional Land Surveying (PLS)
- Project Management (CPPM)

Wentworth Institute of Technology offers graduate programs in the following disciplines:

**Master of Architecture (M.Arch.)**
- Architecture (MARC)

**Master of Engineering, Civil Engineering (M.Eng. CE.)**
- Civil Engineering (MECE)

**Master of Science (M.S.)**
- Applied Computer Science (MSCS)
- Construction Management (MSCM)
- Facility Management (MSFM)
- Project Management (MSPM)
- Technology Management (MSTM)
Accreditation

Wentworth Institute of Technology is accredited by the New England Commission of Higher Education (formerly the Commission on Institutions of Higher Education of the New England Association of Schools and Colleges, Inc.). Accreditation of an institution of higher education by the Commission indicates that it meets or exceeds criteria for the assessment of institutional quality periodically applied through a peer review process. An accredited college or university is one which has available the necessary resources to achieve its stated purposes through appropriate educational programs, is substantially doing so, and gives reasonable evidence that it will continue to do so in the foreseeable future. Institutional integrity is also addressed through accreditation. Accreditation by the Commission is not partial but applies to the institution as a whole. As such, it is not a guarantee of every course or program offered, or the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students who attend the institution. Inquiries regarding the accreditation status by the Commission should be directed to the administrative staff of the institution. Individuals may also contact: New England Commission of Higher Education 3 Burlington Woods Drive, Suite 100, Burlington, MA 01803-4514 (781) 425 7785 E-Mail: info@neche.org

Wentworth is also a member of the Association of American Colleges & Universities (AAC&U), the American Society for Engineering Education (ASEE), the American Council on Education, the Association of Collegiate Schools of Architecture, the Boston Chapter of the International Facility Management Association (IFMA), and the National Commission for Cooperative Education.

College of Arts and Sciences

Wentworth Institute of Technology has received specialized accreditation for its business programs through the International Accreditation for Council for Business Education (IACBE), located at 11374 Strang Line Road in Lenexa, Kansas, 66215 USA.

The following degrees are accredited by IACBE:

- Bachelor of Science in Business Management
- Bachelor of Science in Computer Information Systems

College of Architecture, Design and Construction Management

In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted a six-year, three-year, or two-year term of accreditation, depending on the extent of its conformance with established educational standards.

Doctor of Architecture and Master of Architecture degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree that, when earned sequentially, constitute an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

Wentworth Institute of Technology's Department of Architecture offers the following NAAB-accredited degree programs: a one-year Master of Architecture (pre-professional degree + 36 graduate credits, for internal candidates); a two-year Master of Architecture (pre-professional degree from a NAAB accredited school + 70 graduate credits, for external candidates); and a three-year Master of Architecture (for candidates with an undergraduate degree in a field other than Architecture, or an architecture degree from a school without a NAAB-accredited degree + 106 credits).

The Bachelor of Science degree program in Construction Management (BSCM) is accredited by the American Council for Construction Education (ACCE).

The Bachelor of Science degree program in Interior Design (BINT) is accredited by the Council for Interior Design Accreditation (CIDA).

The Bachelor of Science degree program in Industrial Design (BIND) is accredited by the National Association of Schools of Art and Design (NASAD).

Wentworth Institute of Technology has received specialized accreditation for its business programs through the International Accreditation for Council for Business Education (IACBE), located at 11374 Strang Line Road in Lenexa, Kansas, USA.

The following degrees are accredited by IACBE:

- Bachelor of Science in Facility Planning and Management

College of Engineering and Computer Science

Wentworth programs in Computer Science and Computer Networking are accredited by the Computing Accreditation Commission of ABET (http://www.abet.org).

Wentworth programs in Biomedical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Electromechanical Engineering, Engineering, and Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).

For more information on the accreditation of individual degree programs, please contact the academic department offering the program, or contact the Engineering Accreditation Commission, Engineering Technology Accreditation Commission, or the Computing Accreditation Commission of ABET at:

415 North Charles Street
Baltimore, MD 21201
410-347-7700

College of Professional and Continuing Education

Wentworth Institute of Technology has received specialized accreditation for its business programs through the International Assembly for Collegiate Business Education (IACBE), located at 11374 Strang Line Road in Lenexa, Kan. The business programs in the following degrees are accredited by IACBE:

- Bachelor of Science in Project Management

The Master of Science degree program in Construction Management (BSCM) is accredited by the American Council for Construction Education (ACCE).
Admissions

Admissions - Undergraduate Programs

Maureen Dischino, Assistant Vice President of Enrollment Management and Director of Admissions
Wentworth Hall, Room 108
(617) 989-4000

Wentworth accepts applications on a rolling admissions basis, which means that applications are reviewed as soon as all required documents are received. The priority deadline for full-time admissions for the fall semester is February 15. After that date, applications are reviewed on a space-available basis. Transfer students will be considered for spring semester admissions depending on space availability. The priority deadline for spring admissions is December 1.

Wentworth accepts full-time students in the program majors, either as first-year or transfer applicants, however, students seeking to study part time may apply to the College of Professional and Continuing Education's (CPCE) evening and weekend programs.

Wentworth accepts international students as first-year or transfer applicants. Specific requirements regarding international student admissions can be found in the section on international admissions (p. 15).

The deposit deadline for tuition ($250.00) and on-campus housing ($500.00) is May 1 to guarantee enrollment. Deposits may be accepted after May 1 if space is available. Admissions and on-campus housing deposits are not refundable after May 1.

Each student planning to attend Wentworth must submit completed immunization records and enroll in the Wentworth Health Plan or waive enrollment in the plan if eligible by the bill due date. Failure to provide complete immunization and physical examination records may lead to the cancellation of classes and/or housing.

Please refer to the section regarding transfer credit (p. 13) for information and policies about receiving academic credit for courses taken at another institution, for advanced placement and other exam courses, and for military, professional or other experience.

Wentworth Institute of Technology reserves the right to be the exclusive judge of the acceptability of any applicant for admission to its programs of study.

Admissions Requirements

All undergraduate applicants must have completed four years of English, a mathematics course of study through algebra II, and one laboratory science (e.g., chemistry, physics, or biology) course. For students applying to the Applied Mathematics program, the Applied Sciences program, the Computer Science program, the Cybersecurity program, or any engineering program, pre-calculus is also required.

Application Process and Required Documents for Full-time Undergraduate Admissions

High school seniors may apply any time after August 1 of their senior year. The application priority deadline for completed applications is February 15. After this date, some programs may be closed to further applications.

Applicants for full-time academic programs must submit the following:

- A completed application, which can be submitted online through the Wentworth homepage (http://www.wit.edu), through the Common Application (http://www.commonapp.org), or through the Universal College Application (http://www.universalcollegeapp.com)
- A $50.00 application processing fee, due at the time the application is received
- An official high school transcript or G.E.D. scores
- Official SAT or ACT scores
- At least one letter of recommendation from an academic advisor or teacher
- A personal statement (essay) of 250-500 words

First time incoming students may be required to submit an English Writing Sample during new student orientation based on SAT or ACT scores. To ensure proper placement, students placed into ENGL0700 ENGLISH AS A SECOND LANGUAGE I (COMP), ENGL0800 ENGLISH AS A SECOND LANGUAGE II (LIT & COMP), ENGL0900 ENGLISH LANGUAGE SKILLS, and ENGL1100 ENGLISH I will be reassessed during the first week and able to re-register before the end of drop/add if necessary.

For first time incoming students who have completed college level courses, Advance Placement, International Baccalaureate or Project Lead the Way course work to be evaluated for Wentworth credit, please see the Transfer Credit section (p. 13).

Application Process and Required Documents for Full-time Undergraduate Transfer Admissions

Students who previously matriculated in a degree-seeking undergraduate program must apply as a transfer student. The priority deadline for full-time transfers for fall admissions is February 15. After that date, applications are reviewed on a space-available basis. Transfer students will be considered for spring semester admissions depending on space availability. The priority deadline for spring admissions is December 1.

In addition to the requirements listed above for full-time undergraduate admissions, transfer applicants must also submit the following:

- A transfer report (https://wit.edu/sites/default/files/transfer-report_0_0.pdf) from the most recent college attended. This form (https://wit.edu/sites/default/files/transfer-report_0_0.pdf) must be completed by a school official who is knowledgeable of your academic and disciplinary standing.
- An official transcript from all institutions of higher learning attended.
- SAT/ACT Scores (for students who are within one year of high school graduation)
- Proof of English Proficiency (if necessary, please refer to our English Proficiency Requirements).

Additional requirements for transfer students (if applicable):

- Transfer students may be required to submit an English writing sample at transfer student orientation, unless transfer credit is granted for courses equivalent to English I or English II.
- Students seeking to transfer into the Electromechanical Engineering or Mechanical Engineering programs must have completed similar...
coursework at an accredited college or university (NECHE and/or EAC-ABET accreditation or equivalent) and have a minimum of 2.5 out of a 4.0 GPA for all mathematics and physics courses.

- Students seeking to transfer into the Architecture, Interior Design or Industrial Design programs must present a portfolio of work to receive credit for courses with visual content.

**Transfer Credit**

Incoming First Year or Transfer students wishing to transfer credits to Wentworth must submit an official transcript to the Office of Undergraduate Admissions before the University can evaluate and award credit. Students who have attended regionally accredited institutions can expect to receive credit for successfully completed courses (bearing a grade of "C" or higher) that are comparable in depth and content to those offered at Wentworth. In some cases, courses will transfer as elective credit and those credits will count towards the overall hours required for graduation, but not satisfy program requirements.

No academic credit is awarded for Internships/COOP’s, Practicum, Directed Research, Preparatory, or remedial course work or for courses with grades of "P" or "S". Grades for coursework completed at another institution are not recorded on the students' official transcript, transfer credit is assigned "TR".

Residency requirement for all transfer students enrolled in a full-time baccalaureate degree granting program must complete a minimum of 50% of their required credit hours at Wentworth Institute of Technology.

**Advance Placement (AP)**

<table>
<thead>
<tr>
<th>AP Exam Title</th>
<th>Score</th>
<th>Credits WIT Equivalent Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art History Exam</td>
<td>3, 4, 5</td>
<td>HUMN3797 - AP Art History</td>
</tr>
<tr>
<td>Biology Exam</td>
<td>4, 5</td>
<td>BIOL1100 - AP Cell and Molecular Biology</td>
</tr>
<tr>
<td>Calculus AB</td>
<td>3, 4, 5</td>
<td>MATH1750 - AP Engineering Calculus I</td>
</tr>
<tr>
<td>Calculus AB (Architecture and Construction Management majors only)</td>
<td>3, 4, 5, 8</td>
<td>MATH1000 - AP College Mathematics &amp; MATH1500 - AP Precalculus</td>
</tr>
<tr>
<td>Calculus AB (Computer Information System majors only)</td>
<td>3, 4, 5</td>
<td>MATH1000 - AP College Mathematics</td>
</tr>
<tr>
<td>Calculus AB (Interior and Industrial Design Majors only)</td>
<td>3, 4, 5</td>
<td>MATH1020 - AP Plane and Solid Geometry</td>
</tr>
<tr>
<td>Calculus AB (Business Management majors only)</td>
<td>3, 4, 5</td>
<td>MATH1040 - AP Applied Math for Business</td>
</tr>
<tr>
<td>Calculus AB (Computer Networking majors only)</td>
<td>3, 4, 5</td>
<td>MATH1500 - AP Precalculus</td>
</tr>
<tr>
<td>Calculus BC</td>
<td>3, 4, 5</td>
<td>MATH1750 - AP Engineering Calculus I &amp; MATH1850 AP Engineering Calculus II</td>
</tr>
<tr>
<td>Calculus BC (Architecture and Construction Management majors only)²</td>
<td>3, 4, 5, 8</td>
<td>MATH1000 - AP College Mathematics &amp; MATH1500 - AP Precalculus</td>
</tr>
<tr>
<td>Calculus BC (Computer Information System majors only)</td>
<td>3, 4, 5</td>
<td>MATH1000 - AP College Mathematics</td>
</tr>
</tbody>
</table>

**AP Exam Title** | **Score** | **Credits WIT Equivalent Course**
---|---|---
Calculus BC (Interior and Industrial Design Majors only) | 3, 4, 5 | MATH1020 - AP Plane and Solid Geometry
Calculus BC (Business Management majors only) | 3, 4, 5 | MATH1040 - AP Applied Math for Business
Calculus AB (Computer Information System majors only) | 3, 4, 5 | MATH1000 - AP College Mathematics
Chemistry Exam | 4, 5 | CHEM1100 - AP General Chemistry I
Chinese Language and Culture Exam | 3, 4, 5 | GNEL3797 - AP Chinese Language and Culture
Comp Government and Politics | 3, 4, 5 | POLS3797 - AP Comp Gov't & Politics
Computer Science A | 3, 4, 5 | COMP1000 - AP Computer Science I
English Language and Comp | 3, 4, 5 | ENGL1100 - AP English I
English Language and Comp | 3, 4, 5 | ENGL1100 - AP English I & LITR3797 - AP English Literature
Environmental Science | 3, 4, 5 | SCEL3797 - AP Science Elective
European History | 3, 4, 5 | HIST3797 - AP European History
French Language and Culture | 3, 4, 5 | GNEL3797 - AP French Language and Culture
German Language and Culture | 3, 4, 5 | GNEL3797 - AP German Language and Culture
Human Geography Exam | 3, 4, 5 | SOCL3797 - AP Human Geography
Italian Language and Culture Exam | 3, 4, 5 | GNEL3797 - AP Italian Language and Culture
Japanese Language and Culture | 3, 4, 5 | GNEL3797 - AP Japanese Language and Culture
Latin | 3, 4, 5 | GNEL3797 - AP Latin Language
Macroeconomics | 3, 4, 5 | ECON4152 - AP Macroeconomics
Microeconomics | 3, 4, 5 | ECON4154 - AP Microeconomics
Music Theory | 3, 4, 5 | HUMN3797 - AP Music Theory
Physics 1, Algebra Based | 3, 4, 5 | PHYS1000 - AP College Physics I
Physics C, Electricity & Magnetism | 4, 5 | PHYS1750 - AP Engineering Physics II
Physics C, Mechanics | 4, 5 | PHYS1250 - AP Engineering Physics I
Psychology | 3, 4, 5 | PSYC4100 - AP Introduction to Psychology
Spanish Language and Culture | 3, 4, 5 | GNEL3797 - AP Spanish Language and Culture
Spanish Literature and Culture | 3, 4, 5 | GNEL3797 - AP Spanish Language and Culture
Statistics | 3, 4, 5 | MATH1030 - AP Statistics and Applications
International Baccalaureate (IB) Exams

The following is a list of acceptable examinations and Wentworth courses for which credit may be obtained. Scores of 5, 6, and 7 are acceptable for credit.

- Mathematics Standard Level: MATH1750 ENGINEERING CALCULUS I
- Physics: PHYS1000 COLLEGE PHYSICS I
- IB Humanity/Social Science courses will be considered equivalent if the incoming student places into ENGL1100 ENGLISH I

Regarding ECON4102 Directed HSS requirements: If a student transfers both Microeconomics ECON4154 MICROECONOMICS and Macroeconomics ECON4102 PRINCIPLES OF ECONOMICS the Directed ECON4102 PRINCIPLES OF ECONOMICS is completed plus four additional ECON credits. If a student transfers only ECON4152 MACROECONOMICS or ECON4154 MICROECONOMICS and requires ECON4102 PRINCIPLES OF ECONOMICS, then that student must still complete ECON4102 PRINCIPLES OF ECONOMICS.

Project Lead the Way (PLTW)

As a Project Lead The Way (PLTW) partner, Wentworth will award college credit to first-time enrolled students who successfully complete select PLTW courses with a grade of “B” or higher and an end of course stanine test score of 6, 7, 8 or 9 in order to be considered for transfer credit.

PLTW courses and Wentworth equivalencies are outlined in the chart below.

<table>
<thead>
<tr>
<th>AP Exam Title</th>
<th>Score</th>
<th>WIT Equivalent Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studio Art, 2-D Design</td>
<td>3, 4, 5</td>
<td>GNEL3797 - AP Studio Art: 2-D Design</td>
</tr>
<tr>
<td>Studio Art, 3-D Design</td>
<td>3, 4, 5</td>
<td>GNEL3797 - AP Studio Art: 3-D Design</td>
</tr>
<tr>
<td>Studio Art: Drawing</td>
<td>3, 4, 5</td>
<td>GNEL3797 - AP Studio Art: Drawing</td>
</tr>
<tr>
<td>United States History</td>
<td>3, 4, 5</td>
<td>HIST3797 - AP US History</td>
</tr>
<tr>
<td>US Government and Politics</td>
<td>3, 4, 5</td>
<td>POLS4102 - AP American Government</td>
</tr>
<tr>
<td>World History</td>
<td>3, 4, 5</td>
<td>HIST3797 - AP World History</td>
</tr>
</tbody>
</table>

1 Students who change majors to a program requiring MATH1750 ENGINEERING CALCULUS I an AP credit adjustment will be made on their academic transcript: 4 credits for MATH1750 ENGINEERING CALCULUS I and the 4 credits GNEL1xxx, General Elective will replace the lower level mathematics course (e.g. MATH1000 COLLEGE MATHEMATICS and MATH1500 PRECALCULUS); an even exchange of credit.

2 Students who change majors to a program requiring MATH1750 ENGINEERING CALCULUS I the reallocation of AP credit will be made on their academic transcript: MATH1750 ENGINEERING CALCULUS I, MATH1850 ENGINEERING CALCULUS II, which replaces the lower level mathematics courses (e.g. MATH1000 COLLEGE MATHEMATICS and MATH1500 PRECALCULUS); an even exchange of credit.

Financial Aid

Students applying for financial aid are encouraged to complete the Free Application for Federal Student Aid (FAFSA) by the financial aid priority filing date of March 1. For more information about financial aid, please refer to the financial aid section (p. 49).
Application Process and Required Documents for Full-time Undergraduate International Admissions

The term “international student” refers to any student who is not a United States citizen, U.S. permanent resident, or Deferred Action for Childhood Arrivals (DACA) beneficiary. Most international students obtain F-1 student non-immigrant status.

- A completed application, which can be submitted online through the Wentworth homepage (http://wit.edu), through the Common Application website (http://www.commonapp.org) or through the Universal College Application website (http://www.universalcollegeapp.com).
- Official transcript attesting to the applicant’s secondary and post-secondary education (if applicable). These records must be mailed directly by the attended institution(s) to the Wentworth Office of Admissions. The records must have an original signature, in ink, from the appropriate certifying official (such as a registrar or keeper of records) and bear the institution’s seal. If originals cannot be sent, exact copies certified as such by the appropriate official may be submitted. If the documentation is not in English, it must be accompanied by an official English translation.
- Evidence of proficiency in English if the applicant’s first language is not English. Acceptable evidence of proficiency includes:
  - A Test of English as a Foreign Language (TOEFL) score of 79 or higher on the internet-based exam or 550 or higher on the paper-based exam
  - An International English Testing System (IELTS) overall score of 6.5 or higher, with no sub score below 5.5
  - A “C” (2.0) or higher grade in English I and English II on an official transcript from a U.S. college or university
  - Successful completion of the highest level of a Wentworth-recognized intensive English program and a recommendation from that program's director. A list of recognized programs is available from the Admissions Office.
- Proof of financial support to cover the cost of tuition, books, supplies, medical insurance, and living expenses for the first year of study at Wentworth. For the 2019-2020 academic year, the estimated cost of 12 months for commuter students is $63,950 and $62,650 for resident students. Proof of support must be provided in one of these formats:
  - Completed Wentworth Declaration and Certification of Finances form, signed by the student's sponsor, with an attached certified bank letter from the sponsor's bank
  - Original signed letter of support from a recognized sponsoring embassy, agency, or organization
  - At least one letter of recommendation from an academic advisor or teacher.
  - A personal statement (essay) of 250-500 words.
  - A copy of the identity page from the applicant’s passport.
  - College Official's Report (transfer students) from the most recent college attended. This form (https://wit.edu/sites/default/files/transfer-report_0_0.pdf) must be completed by a school official who is knowledgeable of your academic and disciplinary standing.

Once accepted, a tuition deposit of $250.00 (and a housing deposit of $500.00 if the student chooses to live on campus) is required to guarantee enrollment. The deposit deadline is May 1. Deposits will be accepted after May 1 on a space-available basis. Payments may be made by Flywire (http://www.flywire.com/pay/wit), by credit card, check, or Cashnet. These deposits are refundable for the fall semester, provided that a written request for a refund is sent to the Admissions Office postmarked by May 1 and the original I-20 Form (if issued) is returned to the Admissions Office. For the spring semester admission, the tuition and housing deposits are non-refundable.

Additional Requirements for International Transfer Student

- Wentworth Institute of Technology requires that applicants with coursework or degrees from a non-U.S. university have their transcript evaluated for potential transfer credit. Students must obtain a professional transcript evaluation from one of the following companies:
  - Center for Educational Documentation (CED)
  - World Education Services, Inc. (WES)
- All transfer students (U.S. and non-U.S. universities) must also provide a catalog or syllabus from each post-secondary school attended containing course descriptions for all classes completed. If the documents are in a language other than English, they must be accompanied by the official English translations. All records should indicate the number of lecture and/or laboratory hours per week and the grade received for each course.

When these items are received, an evaluation is made of the applicant's eligibility for admission. If all requirements are met and the applicant is determined admissible, a letter of acceptance will be mailed to the student.

All international students are required to submit an English writing sample during International Student Orientation for placement into the appropriate English level course, unless SAT or ACT scores were submitted and meet the required score for placement into English 1100. To ensure proper placement, students placed into English 1100 will be reassessed during the first week and able to re-register before the end of drop/add if necessary. International transfer students will be required to submit an English writing sample unless transfer credit on prior course work has been awarded for college level English I or English II.

Each international student planning to attend Wentworth must submit completed immunization records and enroll in the Wentworth Health Plan or waive enrollment in the plan if eligible by the bill due date. Failure to provide the necessary documentation may result in the cancellation of classes and/or housing.

Wentworth Institute of Technology has two official languages, English and French. To enroll in a program of study at Wentworth, applicants must be proficient in one of the official languages through the highest level of a Wentworth-recognized intensive English program. Applicants must also demonstrate proficiency in a language other than English by obtaining a professional evaluation by a recognized program. A list of recognized programs is available from the Admissions Office and applicants should consult with the Admissions Office for information regarding these programs. Applicants who are not fluent in English must submit documentation indicating English proficiency. This may include proficiency tests such as the TOEFL or IELTS exam, or an official English translation of non-English language test scores. Applicants who score below the minimum threshold for English proficiency may be required to take an English language course before earning Wentworth credits.
provide complete immunization and physical examination records may lead to the cancellation of classes and/or housing.

**Admissions - Graduate Programs**

Wentworth offers Graduate Master’s programs in a range of disciplines. Our programs are offered either on-campus or online. Explore the programs below, find what you need, and apply.

Wentworth Institute of Technology offers graduate programs in the following disciplines

**Master of Architecture (M.Arch.)**
- Architecture (MARC)

**Master of Engineering, Civil Engineering (M.Eng. CE.)**
- Civil Engineering (MECE)

**Master of Science (M.S.)**
- Applied Computer Science (MSCS)
- Construction Management (MSCM)
- Facility Management (MSFM)
- Project Management (MSPM)
- Technology Management (MSTM)

**Master of Architecture**

Wentworth Institute of Technology offers a Master of Architecture (M.Arch.) degree, a first professional degree accredited by the National Architectural Accrediting Board (NAAB).

Graduate study in architecture is an exhilarating and challenging enterprise, an opportunity for students to develop a focused position within a broad and rapidly evolving field. The graduate curriculum promotes research and design investigations on the linkage between theoretical frameworks, design intentions, and the tangible, material nature of architecture.

Candidates with a Bachelor of Science in Architecture from Wentworth can complete the program in a single year, while external candidates with a four-year, NAAB-based degree from another institution typically complete the program in two years.

Application requirements are listed below. International students should refer to the international student admission section of the catalog for specific additional requirements regarding admission. All transcripts of course work completed outside the United States must be evaluated by CED, Center for Educational Documentation; WES, World Education Services, Inc. The application priority deadline for completed applications is February 15. Students apply online (http://wit.edu/apply).

The Master of Architecture program is offered as a one-, two-, or three-year course of study.

**One-Year Program: (Wentworth B.S. Arch + 36 credits)**

Candidates who are currently enrolled in Wentworth's Bachelor of Science in Architecture degree program are considered internal candidates. Internal candidates who have achieved a cumulative departmental GPA of at least 3.2 at the end of their junior year qualify for automatic acceptance into the program; all other students are encouraged to apply. Students receive confirmation of their automatic acceptance in the fall of their fourth year from the Department of Architecture. Students who have earned automatic acceptance must complete the online application along with the following materials, with the exception of a design portfolio and application fee.

**One-Year Program Application-Internal Candidates**

- **Statement of Objectives:** Answer each of the three following questions listed below.
  - If you were given complete freedom to investigate an architectural question, what would it be and how would you start? (300 words)
  - Describe an object or environment that you have made, repaired, built, or created. (300 words)
  - Name a place (real or imagined) where architecture matters and describe it. (300 words)

- **Resume or Curriculum Vitae (CV)**

- **Reference Sheet:** Include the names and contact information for two people who may be contacted as references. Recommendation letters are not required and should not be submitted. Reference sheets should be submitted as a separate electronic file with the application and include reference name, title, address, email and phone number.

- **Transcript(s):** All applicants must submit a transcript from Wentworth. Unofficial transcripts are acceptable and may be downloaded from LeopardWeb. Unofficial transcripts should be submitted electronically with the application.

- **Application Fee:** A non-refundable $50 fee is required.

- **Design Portfolio:** Portfolios should contain work that demonstrates your proficiency in architecture and reflects the full range of your creative, research, and technical skills. The portfolio should be submitted as an electronic PDF file no larger than 20MB. See the Portfolio Recommendations section below.

**Two-Year Program (prior NAAB accredited B.S. Arch from another institution + 70 credits)-External Candidates**

Candidates who have successfully completed a pre-professional degree in Architecture from an NAAB accredited program or who have graduated from Wentworth's Bachelor of Science in Architecture must complete the external candidate application process. Wentworth graduates may still be considered for admission to the one-year program based on the department's assessment of their status.

**Three-Year Program (prior non-professional degree from another institution + 106 credits)-External Candidates**

Candidates who have successfully completed a four-year undergraduate degree in a discipline other than architecture are eligible to apply. The M.Arch program is structured as a three-year sequence of study for external candidates without previous degrees in architecture.
Two- and Three-Year Program Application Requirements

To apply to the two- or three-year program, candidates must complete the online application (http://wit.edu/apply) and submit the following materials:

- **Statement of Objectives:** Answer each of the three following questions listed below.
  - If you were given complete freedom to investigate an architectural question, what would it be and how would you start? (300 words)
  - Describe an object or environment that you have made, repaired, built or created. (300 words)
  - Name a place (real or imagined) where architecture matters and describe it. (300 words)

- **Resume or Curriculum Vitae (CV)**

- **Recommendation Letters:** With your application, you should submit the names and titles for two people who are providing you with letters of recommendation.

- **Official Transcript(s):** All external applicants must submit an official transcript from all institutions attended after high school graduation. All transcripts of course work completed outside the United States must be evaluated by CED, Center for Educational Documentation; WES, World Education Services, Inc.

- **GRE:** Applicants must complete the Graduate Record Examination (GRE) and submit official scores.

- **Application Fee:** A non-refundable $50 fee is required.

- **Design Portfolio:** Portfolios should contain work that demonstrates your proficiency in architecture and reflects the full range of your creative, research, and technical skills. The portfolio should be submitted as an electronic PDF file no larger than 20MB. See the Portfolio Recommendations section below.

- **Proof of English Proficiency** (for non-native English speakers): Please review Wentworth’s English proficiency requirements (http://wit.edu/admissions/international-student/english-proficiency). International applicants will also be required to submit proof of financial support.

All materials are to be submitted electronically; letters of recommendation may be submitted either electronically or by mail to:

**Admissions Office**
Wentworth Institute of Technology
Attn: Graduate Architecture
550 Huntington Ave
Boston, MA 02115

**Portfolio Recommendations**

The following recommendations are designed to help you produce a strong architectural portfolio.

- **Format:** Applicants should submit an electronic copy of their portfolio. Portfolios may be uploaded to the application or emailed to admissions@wit.edu with the subject line “MARC Application Portfolio”. The body of the email should include the applicant’s full name and address. Electronic portfolios should be PDF files and must not exceed 20MB.

- **Content:** Emphasis should be placed on your four to five best and most creative projects. Creative and professional work may be included if it helps illustrate your abilities to perform successfully as a graduate student. Preference should be given to your original design work. Show a range of your work: sketches, images, photography, sculpture, writing samples, or any work that conveys your artistic sensibilities.

- **Organization:** Portfolios should be well organized with a brief introductory text for each project. Each project should be clearly labeled.

- **Simplicity:** The goal of the portfolio is to legibly display the quality of your design and creative work. Focus your efforts on making the clearest presentation with simple elegant layouts of imagery and brief, informative texts. Use straightforward typefaces (avoid all-caps body texts and force-justification to ease legibility).

- **Quality:** Make an effort to document your work carefully so that photographs, digital prints, and scans of your work are of high quality when printed. The committee expects a professional presentation.

**Admissions Decisions**

Completed applications for the M.Arch program are reviewed by the Department of Architecture. Notification of the outcome of the admissions process occurs by April 1 for admission to the following fall semester. Accepted students must indicate their decision to enroll in writing by no later than May 1, accompanied by a $250.00 tuition deposit and a $500.00 housing deposit. The tuition and housing deposits are non-refundable after May 1. Admissions decisions are mailed to the address provided on the application form.

Wentworth Institute of Technology reserves the right to be the exclusive judge of the acceptability of any applicant for admission to its programs of study. Admission decisions for the M.Arch program are final. All acceptances are contingent upon successful completion of the specified undergraduate degree program and maintenance of the minimum GPA standard.

**Admissions - College of Professional & Continuing Education**

**Master of Science and Master of Engineering Part-Time Programs**

**Summary:**

- Complete online application
- Current resume
- Statement of purpose
- Official transcript(s) from any college(s) attended
- Two professional recommendations
- $50 application fee
- Earned bachelor’s degree or higher from an accredited institution

Applications are accepted for the fall and spring semesters and are reviewed on a rolling basis.

**Admissions Requirements**

Official transcripts from all institutions attended after high school graduation are required.
The recommended undergraduate GPA is 3.0. The admissions committee may request the GRE or GMAT exams if the GPA is below a 3.0.

Admissions Decisions
Notification on the outcome of the admissions process occurs on a rolling basis for admission to the following semester. Wentworth Institute of Technology reserves the right to be the exclusive judge of the acceptability of any applicant for admission to its programs of study. All acceptances are contingent upon successful completion of the specified undergraduate degree program and maintenance of the minimum GPA standard. The decision of the graduate committees related to all aspects of admissions is final.

Master of Science in Applied Computer Science
Master of Science in Applied Computer Science (MSCS) degree is through the College of Professional and Continuing Education (CPCE). The degree is designed to educate professionals in the application of technical computing and management skills required to plan, design, implement, deploy, and operate computer-based solutions within an organization. To be eligible for admission consideration, applicants must possess a bachelor’s degree from an accredited college or university in computer science, computer networking, computer information systems, computer engineering (with significant computer science content), information technology, or software engineering. Candidates should be able to demonstrate competence in three areas: programming, fundamentals of computer science (including computer organization, operating systems, databases, and data communication), as well as statistics.

Please be advised that the Master of Science in Applied Computer Science (MSCS) program is being re-structured. Wentworth is evaluating the curriculum and degree modality in order to improve the program’s academic quality for students; therefore the part-time on-line MSCS program is not starting cohorts until further notice.

Master of Science in Construction Management
Wentworth Institute of Technology offers a part-time Master of Science in Construction Management (MSCM) through the College of Professional and Continuing Education (CPCE). Students must possess a bachelor’s degree from an accredited college or university. An undergraduate degree from an American Council of Construction Education (ACCE) accredited program in construction management is a plus. Candidates must also demonstrate competencies in three areas; construction estimating, construction scheduling, and management.

Competencies can be demonstrated either through prior class work, testing, architectural/engineering/construction (AEC) employment, and/or documented work experience in the field. Qualifications and competencies are assessed on a case-by-case basis. Competencies can also be acquired through CPCE’s Undergraduate Certificate in Managing Construction Projects.

The Master of Science in Construction Management is available in a hybrid delivery format, as well as fully online.

Master of Science in Facility Management
Wentworth offers a part-time Master of Science in Facility Management (MSFM) through the College of Professional and Continuing Education (CPCE). Students must possess an undergraduate degree in one of the following areas of study: facility management, architecture, engineering, construction management, business, or interior design. Students should also be able to demonstrate one year of verifiable full-time work experience in the facility management field, or be able to exhibit competency in the following areas: accounting or finance, real estate, project management, operations, and general management. Competencies can be demonstrated either through prior class work, testing, architectural/engineering/construction (AEC) employment, and/or documented work experience in the facilities management field. Qualifications and competencies are assessed on a case-by-case basis. Facility management competencies can also be acquired through CPCE’s Undergraduate Certificate in Facilities Management.

The Master of Science in Facility Management is available in a fully online delivery format.

Master of Science in Project Management
Wentworth Institute of Technology offers a part-time Master of Science in Project Management (MSPM) through the College of Professional and Continuing Education (CPCE). Successful candidates for admissions must have a bachelor’s degree from an accredited college or university. It is also recommended, but not required, that applicants have at least two years of work experience, which can include, but is not limited to, full-time employment, co-op experiences, and internships. For questions regarding your work experience, please contact an admissions counselor.

Due to the advanced nature of the subject matter, it is also recommended that applicants to the program are able to demonstrate some competency in project management. Project management competency can be demonstrated in many ways including class work, testing, or on-the-job learning. For clarification, or special consideration, please contact one of our admissions counselors.

The Master of Science in Project Management is available in a fully online delivery format.

Master of Science in Technology Management
Wentworth Institute of Technology offers a part-time Master of Science in Technology Management (MSTM) through the College of Professional and Continuing Education (CPCE). Students must possess a BA or BS degree from an accredited college or university and at least one year of professional experience in a technical role and/or technical organization. Familiarity with accounting and finance is a plus but is not required for admission.

The Master of Science in Technology Management is available in a fully online delivery format.

Master of Engineering in Civil Engineering
Wentworth Institute of Technology offers a part-time Master of Engineering in Civil Engineering (MEng CE) degree through the College of Professional and Continuing Education (CPCE). The degree is designed to educate technical professionals in post-graduate civil engineering principles. Students must possess a bachelor’s degree from an accredited college or university. A Bachelor of Science degree from a civil engineering curriculum accredited by ABET is a plus. Results of the GRE or GMAT exams may be submitted but are not required. The M.Eng.CE. admission requirements are based on a 3.0 grade point average and an academic record demonstrating adequate preparation and potential for successful graduate study, or at the discretion of the department chair. Undergraduate degrees from other disciplines will be considered on a case-by-case basis. MEng CE admission qualifications and civil engineering competencies are assessed based on grade point average, relevant work experience, and the completion of additional
coursework to bridge the gap between engineering and the applicant’s undergraduate degree.

The Master of Engineering in Civil Engineering is available in a hybrid delivery format.

Admissions - College of Professional and Continuing Education
Dobbs Hall Room 107A
(617) 989-4300

Program Offerings - College of Professional and Continuing Education

Associate in Applied Science (A.A.S.)
- Building Construction Management (ABCM)
- Engineering Technology (AENT)

Bachelor of Science (B.S.)
- Building Construction Management (BBCM)
- Facility Management (BSFM)
- Project Management (BPM)

Professional Certificates - Undergraduate
- Professional Land Surveying (PLS)
- Facilities Management (CPFM)
- Managing Construction Projects (CMCP)
- Project Management (CPPM)

Master of Engineering, Civil Engineering (M.Eng. CE.)
- Civil Engineering (MECE)

Master of Science (M.S.)
- Applied Computer Science (MSCS)
- Construction Management (MSCM)
- Facility Management (MSFM)
- Project Management (MSPM)
- Technology Management (MSTM)

Workforce Training Programs
- Building Information Modeling
- Construction
- AutoCAD
- CAPM Exam Preparation
- Cisco Certified Network Associate
- Journeyman Electrician
- Construction Supervisor’s License Preparation
- Machine Tooling
- Welding

Associate and Bachelor Degree Admissions Requirements
- Complete online application
- Official high school or GED transcript
- Official transcript(s) from any college(s) attended
- Current résumé
- $50 application fee

Applications for admission must submit an official transcript of record from a recognized high school, except in cases where the applicant possesses an associate degree. The high school equivalency diploma of a state education department or of a high school may be substituted for high school graduation. Students can submit official G.E.D. scores to the College of Professional and Continuing Education office.

Applicants who have attended college must submit an official transcript of their final record from each college they have previously attended.

Professional Undergraduate Certificate Admissions Requirements
- Complete online application
- Official high school or GED transcript
- Official transcript(s) from any college(s) attended
- Current résumé
- $50 application fee

Applications are accepted for the fall and spring semesters.

Graduate Admissions Requirements
- Complete Online Application
- Written statement of purpose
- 1 professional letter of recommendation
- Official transcript(s) for any college(s) previously attended
- Current resume
- $50 application fee

Workforce Training Admissions Requirements
- Complete online pre-registration form (https://ceadmissions.wit.edu/register/workforceapply)

Pre-registration forms are accepted for the fall, spring, and summer semesters.

Non-Matriculating Undergraduate Students
Applicants can also be admitted on a non-matriculating basis to take individual courses. Acceptance to take a course is based on an evaluation of the student’s previous academic experience. Non-matriculating students may not take more than 16 credits without special permission of the Dean of Professional and Continuing Education.

Non-Matriculating Graduate Students
To be eligible for consideration, non-matriculated graduate student applicants must possess a bachelor’s degree from an accredited college or university. Admission requirements are based on a 3.0 grade-point average and an academic record demonstrating adequate preparation and potential for successful graduate study, or at the discretion of the department chair. Non-matriculating graduate students may take a maximum of two (2) graduate level courses or six (6) graduate level credits.
• Complete the application online
• A current resume
• Official transcript(s) from any college(s) you have attended

Specific Program Requirements
Applicants must also fulfill specific requirements, depending on the program to which they are applying. Please refer to the CPCE academic programs section to see if your program has specific requirements.

International Student Application Requirements
Prospective students seeking part-time study who can study in the United States without the institution's support for a student visa are encouraged to apply. International student applicants must provide to the CPCE admissions office:

• A copy of the applicant's current I-94 card (front & back)
• A copy of the applicant's current passport
• A copy of the applicant's current visa

All other admissions requirements for CPCE undergraduate students also apply to international students.

Optional Math Placement Exam
Upon acceptance, CPCE program applicants may complete an online math placement test no later than one full week prior to the start of the semester and before registering for MATH1005 COLLEGE MATHEMATICS A College Mathematics A. Applicants who receive transfer credit for MATH1005 COLLEGE MATHEMATICS A or who have been advised to enroll in Basic Algebra (MATH0900 BASIC ALGEBRA) are not required to complete the test. Each section of the exam will only be given to a student once a semester.

The exam consists of three sections:

• Section I College Mathematics A
• Section II College Mathematics B
• Section III College Mathematics C

All students must take Section I of the exam unless they have been awarded transfer credit for MATH1005 COLLEGE MATHEMATICS A or have been advised to enroll in Basic Algebra (MATH0900 BASIC ALGEBRA). Students are not required to take the other sections unless they are seeking placement into a higher level of mathematics. A student who passes both sections of the exam will be awarded advanced standing credit for College Mathematics A and advised that he/she may advance in the sequence of mathematics courses. Students requiring remediation will be advised of their options regarding preparatory course work. If a student in College Mathematics A, B, or C feels that he/she could test out of a mathematics course, he/she should contact the College of Professional and Continuing Education to arrange to take a comprehensive mathematics placement exam.

Applications are accepted for the fall, spring, and summer semesters.

New Student Orientation
All new online students are required to complete orientation by the first week of classes (unless accepted within two (2) weeks of the start of semester). If orientation is not completed, the student will receive a registration hold for the following semester until orientation is successfully completed.

Academic Activity and Participation Requirements
Given the asynchronous format of online and hybrid courses, students have the opportunity to take part in the class at multiple times during each weekly module. It is recommended that students login to their online/hybrid course, at minimum, 2-3 times per week to participate in discussion boards, read materials, take assessments, and submit assignments. Active participation in online/hybrid courses is required and is often graded by the instructor.

To be considered active, students will be expected to login to their online or hybrid course(s) in the Blackboard Learning Management System (LMS) and participate in at least two (2) “Academic Activities” each week:

• At least one Academic Activity by midnight ET Wednesday each week.
• At least one additional Academic Activity by midnight ET Sunday each week.

“Academic activities” includes any combination of the following:

• Posting to discussion boards within the online course.
• Turning in an assignment within the online course.
• Taking a quiz, test, or other assessment within the online course.

A student who is unable to take part in a given week's activities must contact the instructor prior to any assignment deadlines. Makeup work is accepted at the discretion of the instructor. Students should plan accordingly and make sure to read the schedule of deadlines listed in the course syllabus.
**ACADEMIC POLICIES & PROCEDURES**

**Academic Appeals**

**Grades**

A student who disagrees with a grade or sanction assigned by a faculty member (e.g., project, homework, quiz, test, grading concerning academic dishonesty or misconduct) may submit a grievance in writing to the faculty member within five business days of the notification of the grade. The faculty member will meet or speak with the student at their earliest mutual convenience, no later than one week after receiving the grievance. Based upon the information provided by the student and review of other relevant information, the faculty member will decide if the grade remains or is changed and notifies the student.

For spring semester final grades, when the student and faculty member are not both present on campus, the written grievance is submitted to the faculty member and the department chair (the Director of Academic Operations- College of Professional and Continuing Education [CPCE] for CPCE and the Director of Cooperative Education and Career Development for Co-op related items) through email within five business days from the posting of the grade on Leopardweb. The faculty member and the student will meet or connect within five business days at their mutual convenience. Based upon the information provided by the student and review of other relevant information, the faculty member will decide if the grade remains or is changed. The faculty member will email their decision to the student and the department chair within two business days from the conversation.

**Non-Academic Student Issues of Concern**

A student who has a concern about non-academic issues should contact the Dean of Students or the Director of Human Resources.

**Classroom and Other Academic Review Procedures**

If a faculty member is non-responsive, or the student wished to appeal the faculty member’s decision, a student should contact the chair of the department offering the course in writing, within five business days from the date of the grievance. If the student is a College of Professional and Continuing Education (CPCE) student and/or the course is a CPCE course, the student must contact, in writing, the Director of Academic Operations(CPCE). If the matter is related to Co-op, the student must contact, in writing, the Director of Cooperative Education and Career Development. The academic department chair or the director of academic operations within CPCE or the Director of Cooperative Education and Career Development, should meet/contact the student within two weeks from the receipt of the grievance to settle the concern. If the issue is not resolved at this level, the student can appeal by following the Grade and Attendance Review process.

**Grade Review Process**

When a student disagrees with the decision of the faculty member concerning a grade/sanction assigned by a faculty member (e.g., project, homework, quiz, test, grading concerning academic dishonesty or misconduct, etc.), the following procedure applies.

1. **First Step: Review by the department chair** (Director of Academic Operations -CPCE for CPCE cases; Director of Cooperative Education and Career Development for co-op cases). The student may seek a review by the department chair (Director of Academic Operations -CPCE; Director of Cooperative Education and Career Development). The student submits the communication about the issue with the faculty member, any supporting evidence, and the decision of the faculty member to the department chair of the offering course (Director of Academic Operations -CPCE; Director of Cooperative Education and Career Development). The department chair (Director of Academic Operations -CPCE; Director of Cooperative Education and Career Development) will meet or speak with the student, the faculty member and any other persons he/she deems necessary. The department chair (Director of Academic Operations -CPCE; Director of Cooperative Education and Career Development) will provide the student with a decision within five business days (excluding breaks and holidays) after completing the review.

2. **Second Step: Review by Academic Review Committee (FINAL)** If the student is not satisfied with the decision of the department chair (Director of Academic Operations-CPE; Director of Cooperative Education and Career Development), the student may seek review, in writing, within five business days of receipt of the department chair’s (Director of Academic Operations-CPE; Director of Cooperative Education and Career Development) decision (excluding breaks and holidays) to the Academic Review Committee (ARC). The student must submit all of the prior communications, supporting materials and decision of the faculty member and department chair (Director of Academic Operations-CPE; Director of Cooperative Education and Career Development) to the Executive Assistant to the Provost.

**Academic Review Committee Process**

The Academic Review Committee members are the deans of the college, or other designee selected by the provost. A panel of three members will review each case. A representative of the provost’s office serves as the administrator for the ARC and does not vote.

The ARC administrator will schedule a meeting of the ARC as soon as possible after receipt of the student’s written request for review. The ARC may meet with the student, but it is not required. The ARC reviews all prior material, communications and decisions regarding the matter from the faculty member and the chair and may ask faculty, chairs, or others to attend to answer questions and/or gather additional information. The student will be notified of the decision of the ARC in writing within five days of the meeting (excluding breaks and holidays). The ARC’s decision is final.

**Academic Honesty Policy**

Students, faculty, and staff are responsible for maintaining a proper learning environment at Wentworth. All students are required to abide by the Student Code of Conduct, the Wentworth Creed, and all published Wentworth policies and procedures to satisfy the general requirements for graduation. Wentworth takes violations of academic honesty and cases of academic misconduct very seriously. Sanctions include, but are not limited to: a reduced grade for the assignment, a grade of “0” for the assignment, “F” for the course, removal from a course, Institute suspension, or Institute expulsion. (If a student receives an F as a sanction, they will not be able to withdraw from the course and will no longer be permitted to attend the class.)
Procedures for Handling Academic Honesty Violations

The Wentworth faculty and administration have developed a set of procedures to investigate and determine whether undergraduate and graduate students have engaged in violations of academic honesty. Information about this process can be found on the Academic Affairs website (https://wit.edu/policies/academic-honesty).

Students who suspect another classmate of academic dishonesty can either talk directly to the faculty member or contact EthicsPoint anonymously (855-353-9143 or EthicsPoint Online (http://wit.ethicspoint.com).

Advanced Placement, International Baccalaureate, College Level Examination Program, and Project Lead the Way

Wentworth Institute of Technology offers course equivalencies and credits from many Advanced Placement and International Baccalaureate subject areas. Please consult the tables to determine the subject areas available to WIT students and minimum score requirements.

Advanced Placement (AP)

If the course equivalencies listed below are not required in the student’s program, the student will receive credit for the required lower/prerequisite level course. Advanced Placement (AP) test scores of 3, 4, and 5 are accepted for credit unless otherwise noted.

<table>
<thead>
<tr>
<th>AP Exam Title</th>
<th>Score</th>
<th>Credits</th>
<th>WIT Equivalent Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art History Exam</td>
<td>3, 4, 5</td>
<td>4</td>
<td>HUMN3797 - AP Art History</td>
</tr>
<tr>
<td>Biology Exam</td>
<td>4, 5</td>
<td>4</td>
<td>BIOL1100 - AP Cell and Molecular Biology</td>
</tr>
<tr>
<td>Calculus AB</td>
<td>3, 4, 5</td>
<td>4</td>
<td>MATH1750 - AP Engineering Calculus I</td>
</tr>
<tr>
<td>Calculus AB (Architecture and Construction Management majors only)</td>
<td>3, 4, 5</td>
<td>8</td>
<td>MATH1000 - AP College Mathematics &amp; MATH1500 - AP Precalculus</td>
</tr>
<tr>
<td>Calculus AB (Computer Information System majors only)</td>
<td>3, 4, 5</td>
<td>4</td>
<td>MATH1000 - AP College Mathematics</td>
</tr>
<tr>
<td>Calculus AB (Interior and Industrial Design Majors only)</td>
<td>3, 4, 5</td>
<td>4</td>
<td>MATH1020 - AP Plane and Solid Geometry</td>
</tr>
<tr>
<td>Calculus AB (Business Management majors only)</td>
<td>3, 4, 5</td>
<td>4</td>
<td>MATH1040 - AP Applied Math for Business</td>
</tr>
<tr>
<td>Calculus BC (Computer Networking majors only)</td>
<td>3, 4, 5</td>
<td>4</td>
<td>MATH1500 - AP Precalculus</td>
</tr>
<tr>
<td>Calculus BC</td>
<td>3, 4, 5</td>
<td>8</td>
<td>MATH1750 - AP Engineering Calculus I &amp; MATH1850 AP Engineering Calculus II</td>
</tr>
<tr>
<td>Calculus BC (Architecture and Construction Management majors only)</td>
<td>3, 4, 5</td>
<td>8</td>
<td>MATH1000 - AP College Mathematics &amp; MATH1500 AP Precalculus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AP Exam Title</th>
<th>Score</th>
<th>Credits</th>
<th>WIT Equivalent Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Language and Culture Exam</td>
<td>3, 4, 5</td>
<td>4</td>
<td>GNEL3797 - AP Chinese Language and Culture</td>
</tr>
<tr>
<td>Comp Government and Politics</td>
<td>3, 4, 5</td>
<td>4</td>
<td>POLS3797 - AP Comp Gov’t &amp; Politics</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>3, 4, 5</td>
<td>4</td>
<td>COMP1000 - AP Computer Science I</td>
</tr>
<tr>
<td>English Language and Comp</td>
<td>3, 4, 5</td>
<td>4</td>
<td>ENGL1100 - AP English I</td>
</tr>
<tr>
<td>English Literature and Comp</td>
<td>3, 4, 5</td>
<td>8</td>
<td>ENGL1100 - AP English I &amp; LITR3797 - AP English Literature</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>3, 4, 5</td>
<td>4</td>
<td>SCEL3797 - AP Science Elective</td>
</tr>
<tr>
<td>European History</td>
<td>3, 4, 5</td>
<td>4</td>
<td>HIST3797 - AP European History</td>
</tr>
<tr>
<td>French Language and Culture</td>
<td>3, 4, 5</td>
<td>4</td>
<td>GNEL3797 - AP French Language and Culture</td>
</tr>
<tr>
<td>German Language and Culture</td>
<td>3, 4, 5</td>
<td>4</td>
<td>GNEL3797 - German Language and Culture</td>
</tr>
<tr>
<td>Human Geography Exam</td>
<td>3, 4, 5</td>
<td>4</td>
<td>SOCL3797 - AP Human Geography</td>
</tr>
<tr>
<td>Italian Language and Culture Exam</td>
<td>3, 4, 5</td>
<td>4</td>
<td>GNEL3797 - AP Italian Language and Culture</td>
</tr>
<tr>
<td>Japanese Language and Culture</td>
<td>3, 4, 5</td>
<td>4</td>
<td>GNEL3797 - AP Japanese Language and Culture</td>
</tr>
<tr>
<td>Latin</td>
<td>3, 4, 5</td>
<td>3</td>
<td>GNEL3797 - AP Latin Language</td>
</tr>
<tr>
<td>Macroeconomics</td>
<td>3, 4, 5</td>
<td>4</td>
<td>ECON4152 - AP Macroeconomics</td>
</tr>
<tr>
<td>Microeconomics</td>
<td>3, 4, 5</td>
<td>4</td>
<td>ECON4154 - AP Microeconomics</td>
</tr>
<tr>
<td>Music Theory</td>
<td>3, 4, 5</td>
<td>4</td>
<td>HUMN3797 - AP Music Theory</td>
</tr>
<tr>
<td>Physics 1, Algebra Based</td>
<td>3, 4, 5</td>
<td>4</td>
<td>PHYS1000 - AP College Physics I</td>
</tr>
<tr>
<td>Physics C, Electricity &amp; Magnetism</td>
<td>4, 5</td>
<td>4</td>
<td>PHYS1750 - AP Engineering Physics II</td>
</tr>
<tr>
<td>Physics C, Mechanics</td>
<td>4, 5</td>
<td>4</td>
<td>PHYS1250 - AP Engineering Physics I</td>
</tr>
<tr>
<td>Psychology</td>
<td>3, 4, 5</td>
<td>4</td>
<td>PSYC4100 - AP Introduction to Psychology</td>
</tr>
<tr>
<td>Spanish Language and Culture</td>
<td>3, 4, 5</td>
<td>4</td>
<td>GNEL3797 - AP Spanish Language and Culture</td>
</tr>
<tr>
<td>Spanish Literature and Culture</td>
<td>3, 4, 5</td>
<td>4</td>
<td>GNEL3797 - AP Spanish Literature and Culture</td>
</tr>
</tbody>
</table>
### AP Exam Title | Score | Credits | WIT Equivalent Course
--- | --- | --- | ---
Statistics | 3, 4, 5 | 4 | MATH1030 - AP Statistics and Applications
Studio Art, 2-D Design | 3, 4, 5 | 4 | GNEL3797 - AP Studio Art: 2-D Design
Studio Art, 3-D Design | 3, 4, 5 | 4 | GNEL3797 - AP Studio Art: 3-D Design
Studio Art: Drawing | 3, 4, 5 | 4 | GNEL3797 - AP Studio Art: Drawing
United States History | 3, 4, 5 | 4 | HIST3797 - AP US History
US Government and Politics | 3, 4, 5 | 4 | POLS4102 - AP American Government
World History | 3, 4, 5 | 4 | HIST3797 - AP World History

1 Students who change majors to a program requiring MATH1750 ENGINEERING CALCULUS I (4 credits) an AP credit adjustment will be made on their academic transcript: 4 credits for MATH1750 ENGINEERING CALCULUS I (4 credits) and the 4 credits GNEL1xxx, General Elective will replace the lower level mathematics course (e.g. MATH1000 COLLEGE MATHEMATICS (4 credits) and MATH1500 PRECALCULUS (4 credits)); an even exchange of credit.

2 Students who change majors to a program requiring MATH1750 ENGINEERING CALCULUS I (4 credits) the reallocation of AP credit will be made on their academic transcript: MATH1750 ENGINEERING CALCULUS I (4 credits), MATH1850 ENGINEERING CALCULUS II (4 credits), which replaces the lower level mathematics courses (e.g. MATH1000 COLLEGE MATHEMATICS (4 credits) and MATH1500 PRECALCULUS (4 credits)); an even exchange of credit.

### CLEP Exam Title | Credits | WIT Equivalent Course
--- | --- | ---
Calculus | 4 | MATH1750 - Engineering Calculus I
College Composition | 4 | ENGL1100 - English I
English Literature | 4 | LITR3797 - English Literature
Financial Accounting | 4 | MGMT2700 - Financial Management
French Language, Levels 1 and 2 | 4 | GNEL3797 - French Level 1 and 2
German Language Levels 1 and 2 | 4 | GNEL3797 - German Level 1 and 2
History of the United States I, Early Colonization to 1877 | 4 | HIST4123 - US History to 1877
History of the United States II, 1865 to the Present | 4 | HIST4175 - Modern American History
Human Growth and Development | 4 | PSYC3797 - Human Development
Humanities | 4 | HUMN3797 - Humanities Elective
Introduction to Educational Psychology | 4 | PSYC3797 - Educational Psychology
Introductory Business Law | 4 | MGMT3650 - Business Law
Introductory Psychology | 4 | PSYC4100 - Introduction to Psychology
Introductory Sociology | 4 | SOCL4102 – Sociology
Natural Sciences | 4 | SCEL3797 - Natural Science Elective
Precalculus | 4 | MATH1500 - Precalculus
Principles of Microeconomics | 4 | ECON4154 - Microeconomics
Principles of Macroeconomics | 4 | ECON4152 - Macroeconomics
Principles of Marketing | 4 | MGMT2850 - Principles of Marketing
Social Sciences and History | 4 | GNEL3797 - Social Science and History
Spanish Language, Levels 1 and 2 | 4 | GNEL3797 - Spanish Level 1 and 2
Western Civilization I, Ancient Near East to 1648 | 4 | HIST3797 - Western Civilization I
Western Civilization II, 1648 to Present | 4 | HIST3797 - Western Civilization II

1 CPCE

### International Baccalaureate Exams (IB)
The following is a list of acceptable examinations and Wentworth courses for which credit may be obtained. Scores of 5, 6, and 7 are acceptable for credit.

- Mathematics Standard Level: MATH1750 ENGINEERING CALCULUS I
- Physics: PHYS1000 COLLEGE PHYSICS I
- IB Humanity/Social Science courses will be considered equivalent if the incoming student places into ENGL1100 ENGLISH I

Regarding ECON4102 PRINCIPLES OF ECONOMICS Directed HSS requirements: If a student transfers both Microeconomics (ECON4154 MICROECONOMICS) and Macroeconomics (ECON4102 PRINCIPLES OF ECONOMICS) the Directed ECON4102 PRINCIPLES OF ECONOMICS is completed plus four additional ECON credits. If a student transfers only
ECON4152 MACROECONOMICS or ECON4154 MICROECONOMICS and requires ECON4102 PRINCIPLES OF ECONOMICS, then that student must still complete ECON4102 PRINCIPLES OF ECONOMICS.

**Project Lead the Way (PLTW)**

As a Project Lead The Way (PLTW) partner, Wentworth will award college credit to first-time enrolled students who successfully complete select PLTW courses with a grade of "B" or higher and an end of course stanine test score of 6, 7, 8 or 9 in order to be considered for transfer credit.

PLTW courses and Wentworth equivalencies are outlined in the chart below:

<table>
<thead>
<tr>
<th>PLTW Course</th>
<th>WIT Major (Abbreviation)</th>
<th>WIT Equivalency</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science A</td>
<td>Computer Science (BCOS)</td>
<td>Computer Science A</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Electromechanical Engineering (BELM)</td>
<td>Electrical Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Engineering (BSEN)</td>
<td>Computer Science A or Minor Requirement</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Biological (BSBE)</td>
<td>Introduction to Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Principles of Engineering (BSEN)</td>
<td>Introduction to Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Principles of Engineering (BSBE)</td>
<td>Introduction to Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Principles of Engineering (BBME)</td>
<td>Introduction to Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Principles of Engineering (BSCO)</td>
<td>Introduction to Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Principles of Engineering (BSEE)</td>
<td>Introduction to Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Principles of Engineering (BELM)</td>
<td>Introduction to Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Principles of Engineering (BSEN)</td>
<td>Introduction to Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Principles of Engineering (BSEM)</td>
<td>Introduction to Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>Aerospace Engineering (BSEM)</td>
<td>Technical or General Elective</td>
<td>4</td>
</tr>
</tbody>
</table>

PLTW students who elect to be considered for Wentworth credit must submit an official final high school transcript reflecting the grade(s) of the PLTW course(s) and official end of course test results to:

Wentworth Institute of Technology
Registrar's Office - PLTW Transfer Credit
550 Huntington Avenue
Boston, MA 02115

**Alternative to Classroom Study Options**

Proposals for Alternative Study require the department chair’s approval and must be submitted prior to the last day of the add/drop period.

**Independent Study**

Independent Study courses provide an opportunity for individual pursuit of knowledge in an area not covered in a regularly scheduled classroom course at Wentworth Institute of Technology. Independent Study courses include directed readings, advanced problems or specialized research.

**Co-op Requirement**

As a requirement for graduation, undergraduate program students must complete two cooperative education semesters. Transfer students must complete at least one semester in residence at Wentworth before being eligible for the cooperative education program. Students must have a cumulative grade point average of 2.0 or higher as a requirement of co-op. Students who do not meet the minimum GPA by the end of the semester immediately preceding their co-op will not be eligible for co-op and dropped from their co-op registration.

Students must register for a co-op course for their work experience during the pre-registration period and will maintain full-time status during their co-op semester. Students are required to complete two (2) semesters of COOP; COOP3500 COOP EDUCATION 1 for their first required COOP and COOP4500 COOP EDUCATION 2 for their second required co-op. Students should refer to their specific program requirements to determine the semesters for the COOP sequence.

Optional/Additional co-op courses are:

- COOP3000 PRE CO-OP WORK TERM
- COOP5000 ADDITIONAL CO-OP WORK SEMESTER
- COOP5000 ADDITIONAL CO-OP WORK SEMESTER

Students who elect to be considered for Wentworth credit must submit an official final high school transcript reflecting the grade(s) of the PLTW course(s) and official end of course test results to:

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- COOP5000 ADDITIONAL CO-OP WORK SEMESTER

Students who elect to be considered for Wentworth credit must submit an official final high school transcript reflecting the grade(s) of the PLTW course(s) and official end of course test results to:

Wentworth Institute of Technology
Registrar’s Office - PLTW Transfer Credit
550 Huntington Avenue
Boston, MA 02115

**Alternative to Classroom Study Options**

Proposals for Alternative Study require the department chair’s approval and must be submitted prior to the last day of the add/drop period.
Students must formally petition to receive this course substitution to the Co-ops + Careers Office.

Military Service
To qualify for advanced standing credit, students must provide official documentation of military service and follow the process listed below. Veteran students, spouses and dependents will work with the Assistant Registrar and complete the following steps:

- Obtain your DD-214/Separation papers (http://www.archives.gov/veterans/military-service-records) (if applicable)
- Apply for benefits (https://www.vets.gov/education/gi-bill)
- Obtain Certificate of Eligibility (COE)
- Send COE and DD-214 via fax (617-989-4201, ATTN: SCO) with your Full name, Wentworth ID number and Major

Evaluated Non-College Sponsored Learning (CPCE only)
Students may have acquired college-level learning from non-college professional development programs, training experiences offered by an employer, professional associations, community-based organizations or military experience. This non-college learning might have been evaluated for college credit by the American Council on Education (ACE) CREDIT program. You can find more details about this program (http://www.acenet.edu). If such an evaluation exists, CPCE can accept the recommended credits into a student's degree plan if it fits within the degree requirements.

Prior Learning Assessment (PLA) (CPCE only)
Students in the College of Professional and Continuing Education can earn a maximum of 45 credits in a bachelor's degree program and 27 in associates for learning experiences that took place outside of the classroom, through work experience, training programs, or volunteer opportunities. Students must be admitted into the University for a specific program and must enroll and successfully complete the PLA course in the CPCE within their first two semesters. Credits through PLA are considered as part of your incoming credits and therefore cannot be taken or applied at the completion of your program.

CPCE’s PLA course helps students identify learning outcomes and develop a portfolio that documents learning content so that they may demonstrate how previously acquired knowledge aligns with the learning necessary to earn college-level credit.

During the 3-credit course, faculty work closely with students to ensure that their portfolio content is accurately documented and reflects the requirements of the college level credit for which they are applying. Students will not be awarded credit for PLA portfolio without successful completion of the course. This course is graded as a Pass/Fail.

CPCE Classes
Students enrolled in a full-time day program and seeking enrollment in a course in the College of Professional and Continuing Education, are required to have the approval of both CPCE’s Director of Academic Operations and the academic department where they are receiving their degree.

Attendance
Regular attendance in all classes is expected of all students. The attendance policy for each course is described in the course syllabus by the professor.

Absence due to Religious Observance
Wentworth Institute of Technology welcomes and values people and their perspectives and respects the interests of all members of our community and acknowledges that absences are necessary due to religious observances.

In accordance with Section IIB of Chapter 151C of the Massachusetts General Laws, “Any student in an educational or vocational training institution, other than a religious or denominational educational or vocational training institution, who is unable, because of his religious beliefs, to attend classes or to participate in any examination, study, or work requirement on a particular day shall be excused from any such examination or study or work requirement, and shall be provided with an opportunity to make up such examination, study, or work requirement which he may have missed because of such absence on any particular day; provided, however, that such makeup examination or work shall not create an unreasonable burden upon such school. No fees of any kind shall be charged by the institution for making available to the said student such opportunity. No adverse or prejudicial effects shall result to any student because of his availing himself of the provisions of this section.”

Wentworth recognizes the breadth of religious observance among students, faculty, and staff and the potential for conflict with scheduled components of the academic experience. Students are expected to review the syllabi and notify faculty as far in advance as possible of observances. In such an event, the instructor will provide reasonable accommodations that do not unduly disadvantage the student.

Instructor Arrival
Students must wait at least twenty minutes from the scheduled beginning class time for the instructor to arrive. After that, unless the instructor has previously notified the class to wait for a longer period, the class may leave.

Challenge Exams
Enrolled students who can demonstrate evidence of expertise are eligible to apply for a challenge examination, which has been approved by the appropriate college or school. Challenge examinations may not be repeated and may not be taken for a grade replacement for previously completed courses with grades of "C-" or below. Students must request permission during the first week of classes to take challenge exams in courses in which they are enrolled. Such examinations must be administered during the first two weeks of the semester. Grading for Challenge Exams is pass/fail. Exams are graded before the end of the third week of the semester. Successful completion of a challenge examination results in the listing on the student’s permanent record of the course equivalent, with the notation “credit by examination,” and the amount of credit granted. Challenge exams are not repeatable.

A student may test out of no more than 25% of the courses needed for graduation. Interested and eligible students should be aware of the following:
Challenge Exams in Mathematics

Incoming students without transfer credit who feel they have sufficient knowledge in College Mathematics or Pre-calculus are given the opportunity to take a Mathematics Challenge Exam. Upon successful completion, the requirement for either MATH1000 COLLEGE MATHEMATICS or MATH1500 PRECALCULUS will be met and the appropriate course will be added to the students’ academic transcript. Interested students should contact the Department Chair of Applied Mathematics.

Transfer Challenge Exams

Transfer students who have completed a three-credit transferable mathematics course from the list below are eligible to take the Mathematics Transfer Challenge Exam. Upon successful completion of the Mathematics Transfer Challenge Exam one (1) credit is applied to the three (3) credits of a specified transferable mathematics course and will complete either a pre-requisite or a Wentworth mathematics requirement.

To qualify, transfer students must meet the following criteria: have a transferable three (3) credit mathematics course from the list of available mathematics topics found on the list below, not be enrolled in a Wentworth equivalent course, and not have completed an advanced level mathematics course of the same focus.

Note: Students who do not successfully complete the mathematics transfer challenge exam will not receive the additional one credit and will have to take the required course at Wentworth.

Students have the option to accept the transferable 3 credit mathematics course to satisfy a mathematics requirement for their major, with the understanding they will be required to make up the 1 credit difference to meet the minimum credits required in their degree program.

Available external transfer challenge exams in mathematics:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH1000</td>
<td>COLLEGE MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>MATH1030</td>
<td>STATISTICS &amp; APPLICATIONS</td>
<td>4</td>
</tr>
<tr>
<td>MATH1500</td>
<td>PRECALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MATH1750</td>
<td>ENGINEERING CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>MATH1850</td>
<td>ENGINEERING CALCULUS II</td>
<td>4</td>
</tr>
<tr>
<td>MATH2025</td>
<td>MULTIVARIABLE CALCULUS</td>
<td>4</td>
</tr>
<tr>
<td>MATH2100</td>
<td>PROBABILITY &amp; STATISTICS FOR ENGINEERS</td>
<td>4</td>
</tr>
<tr>
<td>MATH2300</td>
<td>DISCRETE MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>MATH2500</td>
<td>DIFFERENTIAL EQUATIONS</td>
<td>4</td>
</tr>
<tr>
<td>MATH2860</td>
<td>LINEAR ALGEBRA &amp; MATRIX THEORY</td>
<td>4</td>
</tr>
</tbody>
</table>

There are no fees associated with the Mathematics Transfer Challenge Exam.

Change of Name, Address and Emergency Contact Information

Enrollment Confirmation

Prior to the start of each semester, fall, spring and summer students are required to update their demographic and emergency contact information before access to LeopardWeb is permitted. Students participating in a co-op semester or study abroad program are required to complete this process.

Change of Address

Students are responsible for reporting and maintaining all valid address information with Wentworth using LeopardWeb. Students are responsible for any information or administrative actions mailed to them at their address(es) on file.

Change of Name

Currently enrolled students who wish to change their names must complete a Change of Name form (https://wit.edu/ssc/forms) and provide documentation of the name change, such as a marriage license, court order, or Social Security card bearing the new name.

Preferred Name Policy

Wentworth Institute of Technology recognizes that some students use names other than their legal names to identify themselves. As an inclusive and diverse community, Wentworth hopes to provide students an empowering, safe, and non-discriminatory University experience.

The Preferred Name Policy allows students to use a preferred first name different from their legal name for purposes and records in the course of inter-campus business, communication, and education. The legal name will continue to be used where required by law or University requirements.

Change or Declare Programs

Change of Major - Undergraduate Programs

Students seeking to change their major should inform their primary advisor and consult with the academic department chair of the new major they are considering. The academic department chair or other department representative, will interview the student and review the academic record. If the request is approved, a Change of Major form (https://wit.edu/ssc/forms) is completed, which lists all course exclusions with the exception of Humanities and Social Science courses; the grade point average in the new major will consist of only those courses accepted in the new major. The signatures of academic department chair and the student are required for the change to become official. Change of majors for a current semester must be received and processed by the registrar prior to the end of the add/drop period, otherwise all change of majors will become effective at the start of the next semester the student is enrolled. It is important to note that not all change of major requests are granted by the department chair if evidence of academic success is not documented on the student’s academic record. A change of major does not remove the historical academic sanctions that were applied under previous major.

Students considering a change of major should be aware of the potential impact of time to graduate and financial standing. Students are advised to meet with a financial services counselor to discuss any potential impact to financial aid and tuition payments because of the change of major.

Add a Second Degree

Matriculating undergraduates pursuing two baccalaureate degrees must complete at least an additional thirty-six (36) credit hours in residence and all requirements of the second major. Because the program requirements for each major must be met, it is possible that more than thirty-six (36) semester credit hours will be needed to fulfill
these requirements. For day baccalaureate majors, an additional co-op semester is required in the new major. In such cases, a second degree is recorded on the student's transcript and dated accordingly. Wentworth does not allow concurrent dual degrees.

Returning students pursuing an additional degree from Wentworth Institute of Technology must have completed all requirements for the first degree and be formally approved to return in pursuit of a second degree. Non-matriculating students will be held to the catalog year in which the second degree is initiated and will complete at least thirty-six (36) additional credits in residence. Coursework completed in the first baccalaureate degree cannot be applied to the minimum of thirty-six (36) credits in residence requirement; this restriction includes converting a minor/s into a second degree. Upon completion of all required coursework, the additional degree will be recorded on the students' transcript and dated accordingly.

The same policies apply to CPCE students, with the exceptions that a minimum of thirty-two (32) semester credit hours must be taken, and no cooperative work semester is required.

Students seeking a second major are advised to consult with Student Financial Services and Financial Aid.

**Add or Drop a Minor(s)**

Bachelor degree candidates who choose to minor are required to do so no later than the end of the junior year by filing a Minor Declaration form (https://wit.edu/ssc/forms) with the registrar. The Minor Declaration form (https://www.vets.gov/education/gi-bill) must be signed by the department chair of the student major and the department chair of the new minor; students wishing to drop a minor must follow the same procedure. All changes must be submitted prior to submitting a Degree Application to ensure an accurate review of a student's academic record and the timely awarding of a baccalaureate degree.

**Change Catalog Year**

Students are assumed to be following requirements for the various degrees/majors/minors as printed in the academic catalog for their first enrollment term at Wentworth.

Students who wish to follow degree requirements in a subsequent catalog must have the approval of their department chair and file a Change of Major form (https://wit.edu/ssc/forms) with the registrar.

**Change of Major - College of Professional and Continuing Education**

Current CPCE students who wish to change majors must have a grade point average of at least 2.0 cumulative GPA and should contact their advisor to begin the review process. The advisor will interview the student, review the academic record, and identify any courses that will be transferred into the new major. The grade point average in the new major will consist of only those courses taken in the new major. The completed Change of Major form (https://www.vets.gov/education/gi-bill) must have the signatures of the primary advisor and the student prior to being submitted to the registrar. Change of majors for a current semester must be received and processed by the registrar prior to the end of the add/drop period, otherwise all change of majors will effective at the start of the next semester the student is enrolled.

Students wishing to change from full time day programs to the College of Professional and Continuing Education must contact the CPCE admissions office. Students wishing to change from a CPCE program to a full-time day program must submit an application to Undergraduate Day Admissions.

**Changes to Enrollment Status**

Students who wish to change their enrollment status at the University are required to adhere to the following procedures.

**Withdrawal within the Semester-Undergraduate and Graduate**

Students who wish to withdraw from Wentworth are required to submit a Voluntary Withdrawal Form (http://www.wit.edu/ssc/forms) to the Student Service Center ssc@wit.edu with appropriate signatures. A grade of "W" will be assigned to all courses attempted in the effective semester if the form is submitted by the last day for "W" grades published in the Academic Calendar. If a Voluntary Withdrawal Form (http://www.wit.edu/ssc/forms) is submitted after the "W" period deadline, final grades of "F" will be recorded, and the date of withdrawal noted on the transcript will reflect the end date of that semester.

**Withdrawal at the End of the Semester**

Students who wish to complete the current semester and are not intending to return for the next semester are required to submit a Voluntary Withdrawal Form (http://www.wit.edu/ssc/forms) to the Student Service Center ssc@wit.edu. The effective dates of withdrawal will be the last date of attendance, which according to federal reporting guidelines is the last day of the final exam period. Voluntary withdrawals will not be accepted if submitted after the last day of the semester/final exam period.

**Medical Leave of Absence**

Students who are experiencing a physical or mental health condition that impairs their ability to continue their current academic semester may petition for a medical leave of absence. A medical leave of absence provides students time away from campus for treatment.

Students may apply for a medical leave of absence from the University for one semester. Students are limited to one medical leave of absence during matriculation at the Institute. Students who are interested in a medical leave of absence should contact the Office of Student Affairs. Students must complete the Request for a Medical Leave of Absence Petition (http://www.wit.edu/ssc/forms), acquiring the appropriate signatures, and provide appropriate documentation from a care provider, which must be approved by the Center for Wellness. Petitions may not be submitted after December 1 for the fall semester, April 1 for the spring semester, and July 1 for the summer.

The student is expected to be in treatment while they are on a medical leave of absence. The physician or psychologist responsible for treatment must also provide a recommendation supporting the reinstatement of the student. When students are approved for a medical leave, they receive grades of "W" for the current semester and are withdrawn from all preregistered classes for any subsequent semester(s). Students are strongly advised to contact the Financial Aid office to discuss the financial implications and contact their primary advisor to determine the impact on their academic program. Students are also encouraged to consider possible health insurance implications.

To begin the process to return to classes from a medical leave of absence, students should contact the Office of Student Affairs.
Non-Medical Leave at the End of the Semester

A student who desires to interrupt the usual progress of an academic program in an upcoming semester may petition for a Leave of Absence (http://www.wit.edu/ssc/forms). The student must make an appointment with their primary advisor or department chair at least one month prior to the start of the effective semester. International students must make an appointment with the Director of International Student Services to discuss leave of absence procedures in accordance with federal regulations.

Students must meet with their academic department chairs prior to the end of the semester, to review their degree plan for the returning semester. A student returning from an approved non-medical leave must submit notification of intent to return to the Office of the Registrar at registrar@wit.edu no later than 30 days prior to the start of the semester in which they intend to return. Students are required to register for courses upon returning from a leave of absence. Students who are not registered for classes prior to the start of classes of the returning semester will be officially withdrawn from Wentworth.

A Leave of Absence is for one semester; students who do not return to the University at the end of the approved semester will be withdrawn from the University and therefore must submit a Request for Academic Reinstatement (http://www.wit.edu/ssc/forms) to their program of study.

Administrative Withdrawal

Students who are not registered for a subsequent semester within 30 days of the last day of final exams per the academic calendar will be administratively withdrawn from Wentworth by the registrar and will be unable to register for classes until a reinstatement has been processed. Students who are administratively withdrawn and who intend to return and do not skip a semester must submit a Request for Academic Reinstatement form (http://www.wit.edu/ssc/forms) to the Student Service Center ssc@wit.edu; students who skip a semester(s) may be considered for reinstatement; all requests require the approval of their dean. Students must initiate their reinstatement 30 days prior to the start of the term for which they intend to enroll.

Students who do not successfully complete their degree requirements as a result of their final grades and who are not registered for a subsequent semester will be officially withdrawn from Wentworth. The effective date of the withdrawal will be reported as the final day of classes for the last semester in attendance.

Military Deployment Leave of Absence

A Military Deployment Leave of Absence is available to a student in the U.S. Reserves or National Guard who is called to active duty or when an international student is called to active duty in their home country. The student must contact the Student Service Center and complete a Leave of Absence Petition (https://wit.edu/ssc/forms), further the student must provide proof of deployment prior to the leave being approved.

Reinstatement-Undergraduate and Graduate

All students seeking reinstatement from a Leave of Absence or Withdrawal must initiate this process 30 days prior to the start of the semester they wish to enroll. The condition of the separation will determine the process a student follows.

Withdrawal

For a student who officially withdraws from the University and wishes to reinstate, the department chair will review the student's academic record prior to any action being taken. This includes course selection, registration, and housing assignments. Students who wish to reinstate after five years or more must matriculate under the catalog year of their reinstatement. Credit for courses taken more than five (5) years prior to the student's reinstatement to Wentworth is not allowed. This policy applies to courses taken at Wentworth as well as those taken at other schools. All requests for reinstatement must have the approval of the department chair.

Leave of Absence after One Semester

Students who wish to return at the end of their one-semester Leave of Absence must initiate their return by submitting a Request for Academic Reinstatement form (http://www.wit.edu/ssc/forms) to the Student Service Center at ssc@wit.edu at least 30 days prior to the start of the semester they intend to enroll. Students seeking reinstatement from a Leave of Absence must be registered for courses prior to the start of the returning semester or will be withdrawn.

Administrative Withdrawal

Students who are administratively withdrawn due to federal enrollment reporting guidelines must submit a Request for Academic Reinstatement form (http://www.wit.edu/ssc/forms) to the Student Service Center only if there have been no semester gaps in enrollment. Students returning beyond one semester must follow the academic reinstatement process for withdrawn students.

Medical Leave

A student returning from an approved Medical Leave of Absence must provide a recommendation from the physician or psychologist responsible for treatment supporting readmission to WIT. Students must contact the Center for Wellness to initiate the process to return to the University.

Military Deployment

At the completion of their service, students must submit a Request for Academic Reinstatement (http://www.wit.edu/ssc/forms) as notification of intent to return to the Office of the Registrar at registrar@wit.edu.

Voluntary Withdrawal-College of Professional and Continuing Education

All students seeking reinstatement from a Leave of Absence or Withdrawal must initiate this process 30 days prior to the start of the semester they wish to enroll. The condition of the separation will determine the process a student follows.

Withdrawal Within the Semester

College for Professional and Continuing Education (CPCE) students who wish to withdraw from a CPCE program at Wentworth during the semester must complete the Voluntary Withdrawal Form (http://www.wit.edu/ssc/forms). The student must meet with their primary advisor or Director of Academic Operations (CPCE) to complete the withdrawal process. A grade of "W" will be assigned to all courses attempted in the effective semester if the form is submitted by the last day for "W" grades published in the academic calendar. If a Voluntary Withdrawal Form (http://www.wit.edu/ssc/forms) is submitted after the "W" period deadline, final grades of "F" will be recorded and the date of withdrawal noted on the transcript will reflect the end date of that semester.
Students enrolled in a single course and who choose to withdraw from that course are required to complete a Voluntary Withdrawal Form (http://www.wit.edu/ssc/forms).

**Withdrawal at the End of the Semester**

Students who wish to complete the current semester and are not intending to return for the next semester are required to submit a Voluntary Withdrawal Form (http://www.wit.edu/ssc/forms) to the Student Service Center at ssc@wit.edu. The effective dates of withdrawal will be the last date of attendance, which according to federal reporting guidelines is the last day of the final exam period. Voluntary withdrawals will not be accepted if submitted after the last day of the semester/final exam period.

**Reinstatement - College of Professional and Continuing Education**

**After Two or More Consecutive Semester Absences**

Any College of Professional and Continuing Education student who takes two or more consecutive semesters off must be approved to return to the University through an approved Request for Academic Reinstatement form (http://www.wit.edu/ssc/forms).

**Class Requirements: English Placement**

All incoming students will be placed into the appropriate English course based on the required writing sample completed during on-campus sessions unless given an exemption based on the criteria outlined in the Writing Sample Exemption section below. Students who have scored below the minimum score on either the writing, the verbal, or both sections of the SAT or ACT, as well as students whose SAT or ACT scores are not submitted, must complete a required writing sample to determine the best English sequence placement.

**Writing Sample Exemptions**

Exemptions to the required writing sample are made for students whose submitted SAT scores in both Evidenced-Based Reading and Writing of 530 or higher, or ACT English/Writing score of 20 or higher, or AP English Language and Composition Exam score of 3 or higher.

To ensure proper placement, students placed into ENGL0700 ENGLISH AS A SECOND LANGUAGE I (COMP), ENGL0800 ENGLISH AS A SECOND LANGUAGE II (LIT & COMP), ENGL0900 ENGLISH LANGUAGE SKILLS, and ENGL1100 ENGLISH I will be reassessed during the first week and able to re-register before the end of drop/add if necessary.

Students are required to complete one of the following English Sequences determined by the English Placement Process as part of the minimum 28 humanities and social science (HSS) degree requirement.

**Course** | **Title** | **Credits**
---|---|---
**Sequence One**
ENGL1100 & ENGL2200 | ENGLISH I and ENGLISH II | 8
**Sequence Two**
ENGL0900 & ENGL1100 & ENGL2200 | ENGLISH LANGUAGE SKILLS and ENGLISH I and ENGLISH II | 12
**Sequence Three**
ENGL0800 & ENGL1100 & ENGL2200 | ENGLISH AS A SECOND LANGUAGE II (LIT & COMP) and ENGLISH I and ENGLISH II | 12

Once undergraduate students have begun attending Wentworth, their English sequence, if not yet completed and as determined by placement, must be completed at Wentworth. In circumstances that warrant it, exceptions to this policy may be made at the discretion of the Chair of the Dept. of Humanities and Social Science; in such cases, students must appeal to the Chair of HSS directly, who may also defer to the expertise of the English faculty.

**Writing Placement - CPCE students complete the English sequences as follows:**

**Course** | **Title** | **Credits**
---|---|---
Sequence One
ENGL1050 & ENGL2050 | ENGLISH COMPOSITION and LITERATURE AND COMPOSITION | 6

**Distance Students**

**Verification of Student Identity**

The Higher Education Opportunity Act (HEOA) requires institutions that offer distance education courses or programs to have processes in place to ensure that the student registering for the course is the same student who submits work, participates and/or receives course credit. At Wentworth Institute of Technology, all students registering for a course utilize their WIT ID, which corresponds with the specific username of each student. Each student is given a temporary password to login for one-time use, and upon successful login, is immediately required to change the password. Students can change the password thereafter at any time, but are required to change the password every 180 days. The passwords must be a minimum of eight characters using an alpha numeric combination.

While no one method can ensure students taking an online course are completing the coursework themselves, WIT learning and teaching practices help to promote academic honesty. Every WIT student must adhere to the Student Code of Conduct, (as published in the Student Handbook (https://wit.edu/student-life/student-affairs/student-handbook)), the Wentworth Creed, and all published Wentworth policies and procedures about his/her character. In addition, online faculty work closely with instructional designers to develop and implement a variety of assessment tools/methods in their courses. Where appropriate, these include research and writing assignments, discussion board participation, independent and group projects, and quizzes.
Notice of New Student Complaint Procedures for Online (Distance) Students

Wentworth Institute of Technology adheres to the Interregional Guidelines for the Evaluation of Distance Education established by the Council of Regional Accrediting Commissions (C-RAC). To that end, Wentworth has in place effective procedures through which to ensure that the student who enrolls in an online (distance) education course or program is the same student who participates in and completes the course or program and receives the academic credit.

Online Student Complaint Procedures

- Online Programs Complaint Processes (https://wit.edu/sites/default/files/Online%20Complaint%20Recommendation_01_2019.pdf)
- Compliant Agencies for Students Outside of Massachusetts (https://wit.edu/sites/default/files/complain-to-state-agencies-for-website.pdf)
- Compliance Hotline (https://secure.ethicspoint.com/domain/media/en/gui/43864)

If you have any questions, please contact: Brian Burns, Director of Compliance and Risk Management at complianceandrisk@wit.edu.

Online (Distance) Education & State Authorization Reciprocity Agreement (SARA)

The Massachusetts Department of Higher Education (DHE), in its capacity as the SARA portal entity for Massachusetts, reviews and evaluates student complaints regarding distance learning programs offered by Massachusetts-based institutions that are members of SARA in accordance with 610 CMR 12.07. Complaints that should be filed as a SARA Complaint are those that pertain to distance (online) education provided by Massachusetts-based SARA institutions to students residing in other states pursuant to SARA only. Complaints about a SARA institution's operations or activities can be filed to the Massachusetts Department of Higher Education (https://www.mass.edu/forstufam/complaints/complaints.asp) and will be resolved pursuant to 610 CMR 2.00 or otherwise in accordance with the institution's policies.

The SARA complaint process is as follows:

1. Students must first attempt to resolve their complaint using internal administrative procedures offered by the SARA institution.
2. After all administrative remedies have been exhausted with the MA-SARA institution, the student may submit a SARA Complaint. (http://www.mass.edu/foradmin/sara/complaints.asp)
3. The DHE shall send a copy of the complaint to the institution that is the subject of the complaint;
4. Within 30 days of the date that the DHE sends a copy of the complaint to the institution, the institution must provide a written response to the student and the DHE.
5. Within 30 days of the date the DHE received the institution’s response, or if the DHE receives no response, the Commissioner or his or her designee shall issue a notice to the institution containing the Commissioner’s findings regarding the complaint; any corrective actions that the institution shall take; and that, should the institution fail to take those corrective actions, the complaint shall be referred to the Office of the Attorney General for review and, if the Office of the Attorney General deems it appropriate, enforcement action. For more information visit the DHE Complaint Policy and Process document.

Support for Students and Faculty-CPCE Online

Ke'Anna Skipwith, Director of Online Learning
Dobbs Hall, Room 128
617) 989-5021
online@wit.edu

CPCE Online Website (https://wit.edu/continuing-ed/programs/online-learning)

Vision: Transforming the digital learning space through strategic partnerships with the Wentworth community to cultivate a diverse educational experience

Mission: We collaborate with Wentworth’s faculty, students, and staff to enhance the curriculum by developing and delivering flexible and innovative online learning experiences. We provide expertise, support, and training in designing online and hybrid courses, programs, and digital initiatives supported by best practices that foster student success.

Here are some of the services are provided faculty and students:

- Faculty and Student Orientation
- Online Advising and Support
- Course Design and Development
- Course and Faculty Consultations
- Course Preparation and Readiness Support
- Online Learning Best Practices

Grading

Student grade point average (GPA) is determined using the semester credit hours earned in each course multiplied by the weight of the grade received. The sum of these products divided by the total semester hours taken by the student during a semester is the grade point average (GPA). Courses in which advanced standing credit is given for work taken in other institutions of higher education, or in which grades of “IC”, “W”, “S”, “P” or “U” are received, are omitted in determining the grade point average (GPA).

Exclusion of courses from the GPA may occur with one, or any combination, of the following actions:

- The student repeats a grade of “C-“, “D+“, “D“, or “F”
- The student changes program and only the exclusive course requirements of the former major are removed from the GPA calculation of the new curriculum’s GPA, as determined by the appropriate academic department chair. Humanities and social science courses do not qualify for grade forgiveness.

Midterm and Final Grades

Midterm grades are posted at the mid-point of each semester on Leopardweb. Midterm grades do not appear on the student’s official transcript. It is the student’s responsibility to meet with their primary advisor and the instructor of any course in which midterm grades reflect poor academic progress to improve the quality of their work and seek help from all available campus resources. Students should consult the academic calendar for midterm grade due dates and posting dates for each semester.
Final grades are posted after each semester in April, August, and December. Students should consult the academic calendar for final grade due dates and posting dates for each semester. Students with questions or concerns regarding their final grade should contact the instructor for the course.

### Grade Scale: Undergraduate and Graduate

#### Undergraduate

<table>
<thead>
<tr>
<th>Grade</th>
<th>Weight</th>
<th>Numerical Definition</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>93-100</td>
<td>Student learning and accomplishment far exceeds published objectives for the course/test/assignment and student work is distinguished consistently by its high level of competency and/or innovation.</td>
</tr>
<tr>
<td>A-</td>
<td>3.67</td>
<td>90-92</td>
<td>Student learning and accomplishment goes beyond what is expected in the published objectives for the course/test/assignment and student work is frequently characterized by its special depth of understanding, development, and/or innovative experimentation.</td>
</tr>
<tr>
<td>B+</td>
<td>3.33</td>
<td>87-89</td>
<td>Student learning and accomplishment meets all published objectives for the course/test/assignment and student work demonstrates the expected level of understanding and application of concepts introduced.</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>83-86</td>
<td>Student learning and accomplishment based on the published objectives for the course/test/assignment were met with minimum passing achievement.</td>
</tr>
<tr>
<td>B-</td>
<td>2.67</td>
<td>80-82</td>
<td>Student learning and accomplishment based on the published objectives for the course/test/assignment were not sufficiently addressed or met.</td>
</tr>
<tr>
<td>C+</td>
<td>2.33</td>
<td>77-79</td>
<td>Satisfactory (no credit)</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>73-76</td>
<td>Unsatisfactory (no credit)</td>
</tr>
<tr>
<td>C-</td>
<td>1.67</td>
<td>70-72</td>
<td>Grade Not Reported by Instructor</td>
</tr>
<tr>
<td>D+</td>
<td>1.33</td>
<td>67-69</td>
<td>Pass (for credit)</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>60-66</td>
<td>Satisfactory (no credit)</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
<td>0-59</td>
<td>Unsatisfactory (no credit)</td>
</tr>
<tr>
<td>P</td>
<td>0</td>
<td>0-79</td>
<td>Unsatisfactory (no credit)</td>
</tr>
<tr>
<td>S</td>
<td>0.00</td>
<td>96-100</td>
<td>Distinction</td>
</tr>
<tr>
<td>U</td>
<td>0.00</td>
<td>90-92</td>
<td>High Pass</td>
</tr>
<tr>
<td>W</td>
<td>0.00</td>
<td>88-91</td>
<td>Pass</td>
</tr>
<tr>
<td>IC</td>
<td>0.00</td>
<td>80-82</td>
<td>Provisional</td>
</tr>
<tr>
<td>NR</td>
<td>0.00</td>
<td>0-79</td>
<td>No Pass</td>
</tr>
<tr>
<td>NR</td>
<td>0.00</td>
<td>0-79</td>
<td>Pass (for credit)</td>
</tr>
</tbody>
</table>

#### Graduate

<table>
<thead>
<tr>
<th>Grade</th>
<th>Weight</th>
<th>Numerical Definition</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.0</td>
<td>96-100</td>
<td>Distinction</td>
</tr>
<tr>
<td>A-</td>
<td>3.67</td>
<td>92-95</td>
<td>High Pass</td>
</tr>
<tr>
<td>B+</td>
<td>3.33</td>
<td>88-91</td>
<td>Pass</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>84-87</td>
<td>Provisional</td>
</tr>
<tr>
<td>F</td>
<td>0.00</td>
<td>80-82</td>
<td>No Pass</td>
</tr>
<tr>
<td>P</td>
<td>0.00</td>
<td>0-79</td>
<td>Pass (for credit)</td>
</tr>
</tbody>
</table>

### Incomplete Grades Policy

A temporary grade of "IC" may be issued only to a student who has completed most the work in a course, but has a medical emergency, personal emergency, or other circumstance which is beyond the student’s control that would prevent the completion of work by the time grades are due. It is not used to allow students who mismanage their time to turn in work late. Students seeking an "IC" grade must make arrangements with the course instructor prior to the final examination period.

Unresolved "IC" grades received in the fall semester will automatically be changed to "F" at the midterm grade deadline the following spring. Unresolved "IC" grades received in the spring and/or summer semester will automatically be changed to "F" at the midterm grade deadline the following fall. Seven-week courses will have until end of the full term. Session two will have until midterm of the following full term. Unresolved "IC" grades will delay the awarding of an undergraduate or graduate degree until such time a final grade has been awarded or the requirement has been met. No degrees will be conferred with outstanding "IC" grades.

If a student receives an "IC" grade in a prerequisite course for a subsequent, pre-registered course, the "IC" must be completed, and a passing grade received before the end of the drop/add period in the semester the student takes the subsequent course. Permission to remain in the sequence course must be granted prior to the deadline for completion of the "IC" grade from the prior semester. If permission to remain in the pre-requisite course is not granted, the course(s) will be dropped from the student's schedule.

### Pass/Fail Grades

Grades of "P" or "F" are awarded to courses with this grade scheme and carry academic credit. "P" or "F" grades do not calculate into the GPA.

### Satisfactory/Unsatisfactory Grades

Grades of "S" or "U" are awarded to non-credit bearing courses and do not calculate into the student's semester or cumulative GPA.

### Repeated Courses

#### Undergraduate

A course may be repeated for credit if a grade of "C-" or less is received on the first attempt. If a student receives as second grade of "C-" or less in the repeated course, the course may be repeated only once more. The grade for the repeated course is calculated in the GPA in place of the initial grade(s) regardless of the replacement grades earned. The previous grade(s) remains on the record, but neither the previous grade(s) nor the credits are calculated. Students are not permitted to transfer a course to WIT for grade replacement. For grades of "C-" or below, grade replacement courses must be completed at WIT.

#### Graduate

For courses in which a grade of "F" is received, students may repeat that course only once. After the course, has been retaken, the first grade
is excluded from the GPA and replaced by the second grade. Courses passed with a grade of "B-" or higher may not be retaken for improving the overall program GPA. Students are not permitted to transfer a course to Wentworth for grade replacement; grade replacement courses must be completed at WIT.

**Retention of Graded Student Work**

All work submitted for grading is the property of Wentworth Institute of Technology and may be retained at the discretion of the University.

**Special Grading Policies**

Several degree programs have special grading policies that impact continued progress in the program or graduation from the program. Architecture, Industrial Design, and Interior Design have a grading policy regarding studio courses, while Electrical Engineering, Electromechanical Engineering, and Mechanical Engineering all require a minimum GPA for their technical courses in addition to the University minimum GPA required for graduation. All special policies are detailed with the degree program information in this catalog.

**Final Examinations**

Final examinations are given in all courses during the scheduled examination period as published in the academic calendar. The final examination schedule is published on LConnect and students are responsible for consulting it. No student should make travel arrangements that conflict with the examination schedule. Students who, prior to the final exam posting, schedule departure during final exams risk failure in their final course assessment.

Students must complete the final examination on the scheduled day. However, no student will be required to take more than two final examinations on the same day. A make-up exam can be scheduled with course instructors to accommodate students in courses with final exam conflicts. The department chairs involved will determine, if necessary, which final examination will be required to be rescheduled via a make-up exam. Students who experience a medical or personal emergency may follow the procedures outlined in the Incomplete Grades section.

**Dean's List**

Full-time undergraduate degree program students (at least 12 credits) and CPCE undergraduate degree program students (at least 6 credits) who achieve a semester grade point average of 3.50 or higher, with all grades at least "C" (2.0) for the semester, are recognized for their scholastic achievement by placement on the Dean's List, if they have not received any "IC" grades. A Dean's List notation is posted to the student's official transcript following each grading period in April, August, and December.

**Graduation**

**Graduation Criteria**

Curriculum leading to baccalaureate degree are so planned that a student carrying a minimum of 17 credit hours each semester will ordinarily be able to complete the requirements for graduation in four years (48 months, or 10 semesters, which include two semesters of co-op). Degrees will be awarded to candidates who have fulfilled the following:

- A minimum of 28 credits distributed per general education requirements, the requirements of the declared major, and two semesters of required co-op.
- Satisfactory completion of all requirements for a bachelor’s degree must be under a catalog in effect within two years of the date of graduation. The catalog used, however, may be no earlier that the catalog in effect at the time of matriculation or in the case of a change of major, no earlier than the catalog in effect when the major was formally declared.
- A minimum of 50% of the total semester credit hours of any baccalaureate degree-granting day program must be completed at Wentworth Institute of Technology. Day program students must complete all junior, senior, and, where applicable, fifth-year major-specific courses at Wentworth.
- A minimum cumulative GPA of 2.0 or higher and any other academic requirements of the students major as outlined by the department.
- A minimum cumulative GPA of 2.0 or higher is required for an associate degree (CPCE only).
- Students will not be allowed to receive their diplomas or transcripts until all financial debts to the University have been paid.
- Conferral of a degree occurs when the registrar finalizes the student's academic record and confirms that all requirements have been satisfied, which includes grades of "I" (Incomplete).
- Participation in the Commencement ceremony does not constitute conferral of the degree. Similarly, inclusion of a student's name in such publications as the Commencement program does not confirm eligibility for the degree.

**Latin Honor and Graduate Degree Distinction**

Latin honors accompanying undergraduate degrees are awarded in three grades based on the final cumulative grade point average. Students must meet the University Residency requirement to be eligible for Latin honors.

- Summa cum laude, with highest honors, is awarded to students with a 3.90 cumulative GPA or higher.
- Magna cum laude, with high honors, is awarded to students with a 3.75 to 3.89 cumulative GPA.
- Cum laude, with honors, is awarded to students with a 3.50 to 3.74 cumulative GPA.
- The Commencement program is printed prior to grades being submitted for the student’s final semester, therefore the Registrar’s Office must print honors designation based upon the students last completed semester at the time of publication. The student diploma and finalized transcript will reflect the official honors designation based upon the student’s final grade point average. Graduate distinction is based upon the top 10% of the graduating class.

**Participation in Commencement**

Commencement ceremonies occur in April and August. Students in good academic standing may participate in Commencement and are subject to the following conditions:

Students will have satisfied all graduation requirements by Commencement, which includes in-progress courses and at least a 2.0 cumulative grade point average in the semester before graduation.

**Walk-on Policy**

Students who have not satisfied all requirements may participate in the Commencement ceremony by submitting a Petition to Walk at Commencement form (http://www.wit.edu/ssc/forms) to the graduation coordinator at registrar@wit.edu if they have met one of the following
Program Electives
Various majors require technical electives. Students should refer to the Academic Catalog for their catalog year for a listing of approved technical electives or consult with their primary advisor prior to registering for courses.

Registration
Registration - New and Returning Students
Preregistration is held for returning degree seeking undergraduate and graduate students in October for the spring semester, February for the summer session and in March for the fall semester. Prior to registration and depending on the student's program, a Registration Access Code (RAC Code) or Alternate Pin is required and obtained from the student's primary advisor. Students are required to resolve all holds placed on their student account before they can register for classes.

Freshmen day students and all students on academic warning or probation are required to meet with their primary advisor prior to registration to obtain a Registration Access Code(RAC) or Alternate Pin. For course registration that requires permission to register, students should contact the academic department offering the course prior to the schedule date to register.

Registration for newly accepted students occurs during the summer prior to the student’s matriculation in the fall semester. Students register for their courses during New Student Orientation. Incoming transfer students are registered by their academic department chairs and the registrar prior to their arrival. New transfer student schedules are developed based upon awarded transfer credit to best fulfill their curricular requirements.

Registration for continuing students occurs for each of the three academic semesters. Prior to each registration period, course listings, specific registration dates and times, registration instructions as well as up to date information regarding course openings and prerequisites are available online through the LeopardWeb student portal. Responsibility for course selection and fulfillment of graduation requirements ultimately rests with the student.

Colleges of the Fenway Cross Registration
Wentworth is a member of the Colleges of the Fenway (COF), an association of four Fenway-area institutions whose other members are Emmanuel College, Massachusetts College of Art and Design, Massachusetts College of Pharmacy and Health Sciences, and Simmons College.

Students interested in cross-registering for a course through the COF must complete a COF cross-registration form (http://www.colleges-fenway.org/wp-content/uploads/2018/11/Cross-Registration-E-FORM-Spring-2019.pdf) in the Student Service Center. Full-time matriculated students may cross-register for up to two COF courses in each semester, beginning in the second semester of their Freshman year. Course offerings and other information are published online.

Students who cross-register must follow the academic policies and procedures of the host institution for that course. This includes the host institution’s academic honesty policy and adherence to their academic
calendar. Discipline issues will be addressed by the student's home institution.

Grades received in cross-registered COF courses will be computed in the cumulative grade point average in accordance with the Wentworth grading system. Pass ("P") grades are not accepted at Wentworth. Students may not be allowed to register for courses that are graded on a Pass/Fail basis.

To ensure that the COF course will satisfy a degree requirement, prior to enrolling in a course student must complete two forms;

- A Transfer Credit Pre-Approval Form (https://wit.edu/ssc/forms) to obtain approval for the course from the department chair which offers the Wentworth requirement
- A Request for a Course Substitution Form (https://wit.edu/ssc/forms) to ensure upon successful completion of the course the requirement has been satisfied.

If the COF course is to satisfy a major requirement it must be approved by the department chair of the students major; if satisfying a requirement to be applied towards the 28 credit minimum for Humanities and Social Science, the Course Substitution form (https://wit.edu/ssc/forms) requires the approval from the department chair of Humanities and Social Science.

Class Standing
Class standing for undergraduate students is determined by the number of earned credit hours. It does not include credit hours for courses in progress or the number of semesters a student has attended the University.

Undergraduate

<table>
<thead>
<tr>
<th>Class Year</th>
<th>Earned Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>0-31</td>
</tr>
<tr>
<td>Sophomore</td>
<td>32-63</td>
</tr>
<tr>
<td>Junior</td>
<td>64-95</td>
</tr>
<tr>
<td>Senior</td>
<td>96-139</td>
</tr>
<tr>
<td>Fifth Year</td>
<td>140+</td>
</tr>
</tbody>
</table>

Undergraduate College of Professional and Continuing Education

<table>
<thead>
<tr>
<th>Class Year</th>
<th>Earned Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>0-29</td>
</tr>
<tr>
<td>Second Year</td>
<td>30-49</td>
</tr>
<tr>
<td>Third Year</td>
<td>50-73</td>
</tr>
<tr>
<td>Fourth Year</td>
<td>74-93</td>
</tr>
<tr>
<td>Fifth Year</td>
<td>94-113</td>
</tr>
<tr>
<td>Sixth Year</td>
<td>114+</td>
</tr>
</tbody>
</table>

Registration Cancellation for Non-Payment
Students who do not have their accounts paid in full by the tuition due date, complete required financial aid paperwork, or have not made payment arrangements with Student Financial Services/Billing, class registration and/or housing assignment may be canceled for non-payment.

If a student's class registration and/or housing assignment is canceled for non-payment, the student may re-register for classes prior to add/drop, depending on class availability and provided appropriate payment arrangements are made.

If a student's housing assignment is canceled, there is no guarantee that the student will receive on-campus housing.

Approved methods to settle the bill:

- Payment in full OR
- Approved financial aid and all requirements complete OR
- Approved payment plan

Course Load

Full-time undergraduate students must carry a course load of at least 12 credit hours. Failure to carry the minimum number of credit hours may jeopardize housing, financial aid status, athletic eligibility, and health insurance.

- International students must be full-time (at least 12 credit hours) to maintain valid F-1 Student Visa status.
- COOP3000 PRE CO-OP WORK TERM, COOP3500 COOP EDUCATION 1, COOP4500 COOP EDUCATION 2, and COOP5000 ADDITIONAL COOP WORK SEMESTER are considered full-time.
- COOP4699 COOP PROFESSIONAL DEVELOPMENT is considered less than full time enrollment status.
- All graduate students enrolled in nine or more credits are considered full-time.
- Graduate students enrolled in one to eight credits are considered part-time students.

A full-time student may not schedule an overload of courses without the approval of an academic department chair on a Credit Overload Form (https://wit.edu/ssc/forms). An overload is any number of semester credit hours more than 20. No more than 24 credits or a total of six courses will be allowed. A student will be assessed a per-credit tuition charge for each credit exceeding 20 credits in addition to the full-time tuition charge for that semester; payment for credit overloads is due at the time of registration. Refer to the tuition and fees portion of the catalog for more information.

Course Changes and Withdrawals

Students can make schedule changes during the first week of the fall, spring, and summer semesters. Students should consult the Academic Calendar for part of term course change dates.

Students who withdraw from a course after the end of the drop/add period and before the published deadline for the last day to withdraw will receive a "W" recorded in the grade column of their academic transcript. Student who choose to withdraw from a course after the deadline will receive a final grade of "F". To withdraw from a course after the drop/add period, students must complete the Course Withdrawal form (https://wit.edu/ssc/forms), which includes the signatures of their instructor and primary advisor, and submit it to the Student Service Center no later than the deadline published in the Academic Calendar. Under extenuating circumstances, the department chair’s signature may be substituted for the primary advisor’s signature. Students will not be permitted to withdraw from courses after the published deadline; non-attendance does not constitute withdrawal from a course.

Students enrolled for less than 12 credit hours may impact a student’s financial aid package, housing, and may extend a student’s graduation date. International students who wish to withdraw from a course are
required to obtain the written permission of the Director of International Student Services in the Student Service Center; International students must be full-time to maintain valid F-1 Student Visa status.

Time conflicts of courses are not normally permitted. Students whose courses conflict should meet with their academic department chair to develop an appropriate alternative schedule and a curriculum plan. Under exceptional circumstances, students may register for courses with otherwise unresolvable time conflicts by obtaining the Time Conflict Override form (https://wit.edu/ssc/forms). Overrides are processed by the Academic Coordinator.

Transfer Credit after Matriculation

To receive credit for courses taken at another accredited institution, degree-seeking undergraduate students must obtain approval in advance. Failure to obtain this approval could result in denial of the course credit.

The Transfer Credit Pre Approval Form (https://wit.edu/ssc/forms) is available on the registrar’s website. Requests for approval of a course from another institution should be accompanied by the course description from that institution’s catalog. Approval must be obtained prior to registering for the course at the other institution. It is the students’ responsibility to have official transcripts sent directly by the institution to the Registrar’s Office upon completion of the course.

Students may not use a transfer course to replace a failed Wentworth course. Courses failed at Wentworth must be repeated at Wentworth. All Junior, Senior and fifth-year degree requirements must be completed at Wentworth.

Note: a minimum grade of "C" is required for credit transfer. Grades for courses taken at an institution other than Wentworth are not used in computing the student’s GPA. No academic credit is awarded for Internship/co-op, Practicum, Directed Research, Preparatory, or remedial course work or for courses with grades of “P” or “S”. Grades for coursework completed at another institution are not recorded on the student’s official transcript, transfer credit is assigned a grade of “TR”.

Incoming Freshman or New Transfer students wishing to transfer credits to Wentworth must submit an official transcript to the Office of Undergraduate Admissions before the University can evaluate and award credit. Students who have attended regionally accredited institutions can expect to receive credit for successfully completed courses (bearing a grade of "C" or higher) that are comparable in depth and content to those offered at Wentworth. In some cases, courses will transfer as elective credit and those credits will count towards the overall hours required for graduation, but not satisfy program requirements.

Residency Requirement

Students enrolled in a baccalaureate degree-granting Day program must complete a minimum of 50% of their total credit hours at Wentworth Institute of Technology. All junior, senior, and, where applicable, fifth-year major-specific courses must be completed at Wentworth.

CPCE residence requirement for AS degrees is 50% and, for BS degrees, students can transfer up to eighty (80) credits. CPCE graduate students can transfer six (6) credits. CPCE undergraduate and graduate students must complete their final semester at Wentworth. CPCE graduate students may, with approval of the department chair, apply up to six (6) credits of graduate work completed elsewhere toward the Master of Sciences Applied Computer Science (MScS), Master of Science Construction Management (MSCM), Master of Science Facility Management (MSFM), Master of Science Technology Management (MSTM), or Master of Engineering in Civil Engineering (MECE).

Transcripts

The Wentworth Institute of Technology transcript is an official document reflecting a student’s cumulative academic record. An official transcript is reproduced on colored paper stock bearing the seal of WIT and is issued directly to the person or institution specified by the student. All transcripts are issued in accordance with the Family Educational Rights and Privacy Act of 1974 and may not be released to a third party without the prior written consent of the student.

Transcripts noted at the point of graduation issued from WIT reflect the student major, minor/s, certificates and honorary distinction. Transcript requests are submitted through the National Clearing House e-transcript website (http://www.iwantmytranscript.com). E-transcripts are issued within 24 hours of the request. Transcripts with dates of attendance prior to 1985 will take a minimum of three working days to process. Official transcripts cannot be sent via fax transmission from Wentworth.

All outstanding debts must be satisfied prior to release of the transcript. Requests for transcripts should include dates of attendance, graduation, name at the time of attendance, declared major, and W ID number, if available; there is no fee for transcripts.

Undergraduate and Graduate Degrees

Degrees Awarded

The following undergraduate and graduate degrees are awarded by Wentworth Institute of Technology:

- Associates in Science (College of Professional and Continuing Education only)
- Bachelor of Science
- Master of Architecture
- Master of Science (College of Professional and Continuing Education)
- Master of Engineering (College of Professional and Continuing Education)
- Professional Undergraduate Certificates (College of Professional and Continuing Education)

Replacement Diplomas

Students or alumni in need of a replacement diploma must submit a Request for Duplicate Diploma (https://wit.edu/ssc/forms) and submit it to the Student Service Center at ssc@wit.edu. The form must be notarized, and there is a $50 replacement fee due at the time the completed form is submitted.

Time to Degree

Any student who requires more than two years after their anticipated graduation date to complete a program of study must be academically reviewed by their department chair or the director of academic advising within the College of Professional and Continuing Education. Students who wish to reinstate after five (5) years or more must matriculate under the catalog year of their reinstatement. Credit for courses taken more than five (5) years prior to the student’s reinstatement to Wentworth is not allowed. This policy applies to courses taken at Wentworth as well as
those taken at other schools. All requests for reinstatement must have the approval of the department chair.

**Programs No Longer Offered**

Any student who is enrolled in a program which is no longer offered by the University must complete all graduation requirements for that program within one year after the original expected date of graduation. Any student who fails to satisfy all requirements within the one-year period must have their academic records evaluated by an academic department chair/the dean of CPCE to determine which course of study and program must be followed. Beyond the one-year statute of limitation the University will not grant a degree for any program which has been discontinued.

**Degree Application**

Students who believe they are ready to receive their degree from Wentworth Institute of Technology and have a grade point average of 2.0 or higher are required to complete a formal degree application (https://wit.edu/ssc/forms). (See Academic Calendar (p. 5) for specific dates.) Degree applications will not be accepted from students with a grade point average below 2.0. Applications for graduation are submitted via LeopardWeb and are required to ensure the Registrar has received all student credentials. Degrees conferred reflect the graduation that follows the student’s successful completion of all degree requirements; degrees are conferred in April, August, and December.

**Undergraduate and Graduate Good Academic Standing**

Wentworth is committed to the academic success of all students. It monitors progress toward success via the Academic Good Standing requirements. To remain in Good Academic Standing students must meet a required cumulative grade point average. Failure to meet Good Academic Standing requirements will result in sanctions and interventions, including dismissal from the University.

Good Academic Standing is not the same as Satisfactory Academic Progress for financial aid. Refer to the Financial Aid section (p. 49) for more information on financial aid eligibility.

**Undergraduate Good Academic Standing**

To remain in Good Academic Standing all undergraduate students must maintain the minimum GPA according to the scale below:

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Cumulative Credits</th>
<th>Minimum GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>0-31</td>
<td>1.75</td>
</tr>
<tr>
<td>Sophomore</td>
<td>32-63</td>
<td>2.00</td>
</tr>
<tr>
<td>Junior</td>
<td>64-95</td>
<td>2.00</td>
</tr>
<tr>
<td>Senior</td>
<td>96-139</td>
<td>2.00</td>
</tr>
<tr>
<td>5th Year</td>
<td>140+</td>
<td>2.00</td>
</tr>
</tbody>
</table>

A cumulative GPA is the GPA calculated using grades from all semesters. A semester GPA is the GPA calculated using grades from the current semester.

Transfer students will be considered to have completed one semester of full-time study for every 12 credits of posted transfer credit. For example, a student who transfers in 24 credits and completes at least 12 credits must have a GPA of 2.0 at the end of their first semester to achieve Academic Good Standing. Part time students must meet the GPA requirement of full time students based upon the number of credit hours they have completed. For example, a part time student who has completed between 24-31 credits would be expected to have a GPA of 1.75, a part-time student who has completed 48 credits would be expected to have a GPA of 2.0

**Graduate Good Academic Standing**

Minimum requirements for all students enrolled in graduate degree programs must maintain a minimum cumulative GPA of 3.00.

**Notification to Students**

Students who fail to meet the minimum requirements for Good Academic Standing at the end of each semester are notified via their WIT e-mail address within two weeks after final grades are posted to their academic record. Academic Dismissal notifications are sent prior to the start of the academic sanction semester.

**Academic Warning**

Academic Warning is semester-based and serves as an advance notice to students that there is a need to increase their focus on their academic performance; otherwise, they may fall into probationary status. Students are encouraged to meet with their primary advisor to discuss methods to improve their GPA. Notices are issued to students via their Wentworth e-mail after each semester whose semester GPA does not meet the minimum GPA for their class level. Academic Warnings appear on a student's official transcript.

**Academic Probation**

Academic Probation status is based upon cumulative GPA. Probation formally warns students of the need to increase their focus on their academic curriculum and to take personal responsibility for addressing their deficiencies. Students who fail to meet the minimum cumulative GPA requirements for their class level are placed on probation for one semester. A student who fails to meet the minimum GPA for their class level in a second semester (consecutive or not) is placed on Continued Academic Probation. Probationary status is placed on the student’s official transcript.

Students on probation are encouraged to take advantage of the resources of the University including their primary advisor, the Center for Academic Excellence, and the Center for Wellness, to develop strategies for success in their academic life. Students on probation are encouraged to meet all the requirements outlined on the Probation Checklist.

Students who take classes at Wentworth or courses from the Colleges of the Fenway consortium for improving their GPA, but during a non-scheduled semester, may petition to have their probationary status reviewed following the posting of their final course grades. Petitions should be addressed to the Office of the Provost in care of the Assistant to the Provost.

**Academic Dismissal**

A student who is currently on Continued Probation and whose GPA falls below the minimum GPA for Good Academic Standing for this class year, is subject to Academic Dismissal. Academic Dismissal is placed on the student’s official transcript. Students who have been academically dismissed may appeal this decision in writing to the Academic Appeals Committee in care of the assistant to the provost, per the guidelines outlined in the letter of dismissal. The decision of the Academic Appeals Committee is final. Students have the option to submit a request for
reinstatement from academic dismissal following a period of one semester from the last semester enrolled. Requests for Reinstatement from academic dismissal must be submitted to the Registrar 30 days prior to the first day of class of the returning semester. All requests to reinstate are reviewed by the department chair of the student's major; students will be notified within one week of the request.

**WIT Academic Credit**

**WIT Academic Credit Awarded for Academic Engagement**

<table>
<thead>
<tr>
<th>Credits Awarded</th>
<th>Minutes of “Academic Engagement” (^1)</th>
<th>Clock Hour</th>
<th>50-minute “Hour”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2,250 (37.5 hours)</td>
<td>45</td>
<td>37.5</td>
</tr>
<tr>
<td>2</td>
<td>4,500 (75 hours)</td>
<td>90</td>
<td>75</td>
</tr>
<tr>
<td>3</td>
<td>6,750 (112.5 hours)</td>
<td>135</td>
<td>112.5</td>
</tr>
<tr>
<td>4</td>
<td>9,000 (150 hours)</td>
<td>180</td>
<td>150</td>
</tr>
<tr>
<td>5</td>
<td>11,250 (187.50 hours)</td>
<td>225</td>
<td>187.5</td>
</tr>
<tr>
<td>6</td>
<td>13,500 (225 hours)</td>
<td>270</td>
<td>225</td>
</tr>
</tbody>
</table>

\(^1\) Adjusted for NECHE 50-minute hour.

GEN-11-06 United States Department of Education Office of Post-secondary Education the Assistant Secretary.

Guidance to Institutions and Accrediting Agencies Regarding a Credit Hour as Defined in the Final Regulations Published on October 29, 2010.

An amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates not less than:

- One hour \(^1\) of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or

- At least an equivalent amount of work as required in paragraph one of this definition for other academic activities as established by the institution, including laboratory work, internships, practice, studio work, and other academic work leading to the award of credit hours.

\(^1\) NECHE assumes a 50-minute “hour.”
UNIVERSITY POLICIES

Annual Notification of Rights (FERPA)

It is Wentworth Institute of Technology's policy to limit the dissemination of student information. The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records.

Definitions

Directory information – As designated by Wentworth from the statutory list: name, local address, major field of study, dates of attendance, anticipated graduation date, degrees conferred, University-issued email address, enrollment status, honors, past and present participation in officially recognized sports and activities, and physical factors of members of athletic teams.

Education records – Any record (in handwriting, print, tapes, film, electronic, or other medium) maintained by Wentworth or an agent of Wentworth that is directly related to a student, except:

1. A personal record in the sole possession of the maker of the record and is not accessible or revealed to any other person except as temporary substitute for the maker of the record.
2. An employment record of a person not due to his/her student status, provided the record is used only in relation to the individual’s employment.
3. Records that are created and maintained by Public Safety for law enforcement purposes.
4. Records made or maintained by a physician, psychiatrist, psychologist or other recognized professional or paraprofessional acting in his or her professional or paraprofessional capacity and that are used only in connection with the treatment of a student and that are disclosed only to individuals providing that treatment.
5. Alumni records that contain information about a student after he or she is no longer in attendance at Wentworth and that do not relate to the person as a student.

Legitimate educational interest – Indicates the need of a school official to review an education record in order to fulfill his or her professional responsibility.

Parent – A person who is the parent of the student, a guardian, or an individual acting as a parent in the absence of a parent or guardian. Parents who have claimed a student as a “dependent” on their federal or state tax return may be entitled to access to student records without the permission of the student. Court records and/or agreements between the parents of a student will be reviewed to verify parental status and access in some cases.

Personally identifiable information – Names, parents or other family members’ names, address and address of student or family, personal identifiers information that alone or in combination, is linked to a specific student that would allow a reasonable person in the Wentworth community to identify the student with reasonable certainty, information requested by a person whom Wentworth believes knows the identity of the student.

School official – A person employed by Wentworth in an administrative, supervisory, academic or research, law enforcement unit, health and counseling, support staff position, a person or company with whom Wentworth has contracted (such as an attorney, auditor, or collection agent), a person serving on the Board of Trustees, and a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks.

Student – Any person who attends or has attended Wentworth. Persons admitted but never matriculated are not considered students.

A Student’s Rights under FERPA

1. The right to inspect and review the student’s education records within 45 days of the day Wentworth receives a request for access.

Students should submit to the registrar written requests that identify the record(s) they wish to inspect. The registrar will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the registrar, the registrar shall advise the student to address the request to the appropriate Wentworth official.

A student may read any recommendation in his/her files unless the right to do so has been waived in writing.

The following is a list of the types of education records that Wentworth maintains; the location(s) of such records; and their custodians (or the custodian’s designee):

<table>
<thead>
<tr>
<th>Education Records</th>
<th>Location</th>
<th>Custodian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Records</td>
<td>Office of the Registrar</td>
<td>Registrar</td>
</tr>
<tr>
<td>Admissions Files for students currently enrolled or have a history of enrollment</td>
<td>Office of the Registrar</td>
<td>Registrar</td>
</tr>
<tr>
<td>Admissions Files for students in pre-enrollment status</td>
<td>College of Professional and Continuing Education (CPCE) Admission</td>
<td>Director of Marketing and Admissions</td>
</tr>
<tr>
<td>Enrollment Records</td>
<td>Office of the Registrar</td>
<td>Registrar</td>
</tr>
<tr>
<td>Career Services Records</td>
<td>Center for Cooperative Education and Career Development</td>
<td>Director of Center for Cooperative Education and Career Development</td>
</tr>
<tr>
<td>Counseling and Academic Placement Testing Records</td>
<td>Center for Wellness</td>
<td>Director of Counseling</td>
</tr>
<tr>
<td>Academic Records (grades, transcripts)</td>
<td>Office of the Registrar</td>
<td>Registrar</td>
</tr>
<tr>
<td>Academic Disciplinary Records</td>
<td>Office of the Provost; Office of the College Dean; and/or Department Chair</td>
<td>Provost; Academic Discipline Board; College Dean and/or Department Chair</td>
</tr>
<tr>
<td>Non-Academic Disciplinary Records</td>
<td>Student Affairs</td>
<td>Dean of Students</td>
</tr>
<tr>
<td>Financial Aid Records</td>
<td>Student Service Center</td>
<td>Director of Financial Aid</td>
</tr>
</tbody>
</table>
2. The right to request the amendment of the student's education records that the student believes is inaccurate, misleading or otherwise in violation of his or her privacy rights.

Students may request an amendment to a record that they believe is inaccurate or misleading. They should write the Wentworth official responsible for the record, clearly identify the part of the record they want changed and specify why it is inaccurate or misleading.

If Wentworth decides not to amend the record as requested by the student, Wentworth will notify the student of the decision and advise the student of his or her right to a hearing for appeal. The hearing will take place with the FERPA Appeals Committee. This committee's membership will include the associate vice president of Student Affairs, the associate vice president of Enrollment Management, the registrar, the associate vice president of Finance, and Vice President of Executive Affairs.

If as a result of the hearing, the FERPA Appeals Committee finds that the information in the education record is not inaccurate, misleading, or otherwise in violation of the student's privacy rights, the student shall have the right to place in the education records a statement commenting on the contested information in the record or the reason(s) the student disagrees with the decision of Wentworth.

A student may not challenge a grade given through this procedure, only the accurate recording of the grade.

3. The right to consent to disclosures of personally identifiable information contained in the student’s education records, except to the extent that FERPA authorizes disclosure without consent.

Personally-identifiable information from the education records of a student will be disclosed by Wentworth upon the prior written consent or request of the student. The written consent or request must (a) specify the records that may be disclosed; (b) state the purpose of the disclosure and (c) identify the party or class of parties to whom the disclosure may be made. However, Wentworth may disclose information without the prior written consent of the student in the following circumstances:

a. To school officials with a legitimate educational interest in the records.

b. To officials of another school, at the request of those officials, in which a student seeks or intends to enroll.

c. To certain officials of the U.S. Department of Education, the U.S. Comptroller General, and state and local educational authorities, in connection with certain state or federally supported education programs.

d. In connection with a student's request for or receipt of financial aid, as necessary to determine the eligibility, amount or conditions of the financial aid, or to enforce the terms and conditions of the aid.

e. To organizations conducting certain studies for or on behalf of Wentworth.

f. To accrediting organizations to carry out their functions.

g. To either of two parents when at least one parent has claimed the student as a dependant for income tax purposes. A certified copy of the parents’ most recent Federal Income Tax Form may be required to verify dependency.

h. To comply with a valid court order or subpoena or to comply with federal law (e.g., the USA Patriot Act).

i. To appropriate parties in a health or safety emergency.

j. To a victim of an alleged perpetrator of a crime of violence or a non-forcible sex offense, the final results of a disciplinary proceeding conducted by Wentworth with respect to that alleged crime or offense. Wentworth may disclose the final results of the disciplinary proceeding, regardless of whether it concluded a violation was committed.

k. Directory information designated by Wentworth.

l. To parents of students under the age of 21 when laws or Wentworth policies regarding alcohol or drugs are violated.

m. To parents of students when disciplinary action may be taken.

n. To parents of students when a student is at risk of harming themselves or others or in the event of a medical emergency.

o. To a court or administrative agency in the event of legal action between Wentworth and a student.

4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by Wentworth to comply with the requirements of FERPA.

The name and address of the federal agency that administers FERPA is:

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, SW
Washington, DC 20202-4605

5. Directory Information (Limitation on Disclosure)

Students may restrict the release of directory information, except to school officials with legitimate educational interests and to others as permitted by law. If a student wishes to prevent disclosure, the student must complete a Request to Prevent Disclosure of Directory Information form in the Student Service Center or online. A student’s Request to Prevent Disclosure of Directory Information is valid for the life of the record or until a request to reverse non-disclosure is made in writing to the Registrar’s Office.

Delivery of Services

Wentworth Institute of Technology assumes no liability, and hereby expressly negates the same, for failure to provide or delay in providing educational or related services or facilities or for any other failure or delay in performance arising out of or due to causes beyond the reasonable control of the University, which causes include, without limitation, power failure, fire, strike by University employees or others, damage by the elements, and acts of public authorities. The University will, however, exert reasonable efforts, when in its judgment it is appropriate to do so, to provide comparable or substantially equivalent services, facilities or performance, but its inability or failure to do so shall not subject it to liability.
Disposition of Records

Applications and related material for persons not accepted are retained for seven years and then destroyed. After a student separates from Wentworth, applications and related materials are retained in the Registrar’s Office for seven years.

After seven years following graduation, student records are archived and typically the following materials are retained:

- Transcripts
- Record of grade changes

Identification Cards

All students and employees must carry their Wentworth identification card at all times. Students must present them upon the request of a faculty member, member of the administration, or other person of authority. Any student refusing to surrender an identification card when properly requested to do so will be subject to disciplinary action. Students must have current, valid identification cards in order to borrow books from the library, use the gym facilities, enter the studios and residence halls, etc. ID cards are to be used only by the persons to whom they were issued; they are non-transferable. Students who need to replace a lost or damaged ID card can do so in the Copy Mail Center. A replacement cost will be assessed.

When students purchase a board plan, money is placed onto the identification card for use in the Wentworth cafeteria and convenience store, Massachusetts College of Art and Design cafeteria, and the Massachusetts College of Pharmacy and Health Sciences (MCPHS) coffee shop. Students may also open a Fenway Cash account to be used for purchases in the Wentworth bookstore, convenience store, some vending machines, as well as all five of the Colleges of the Fenway cafeterias and at many off-campus businesses. Refer to the Student Handbook for additional information.

Images/ Photographs/ Video Recordings

Wentworth Institute of Technology is authorized to use photographs, videos, and audio recordings of any student on campus or at a campus event. These can be used in printed and electronic publications, on the internet, and in other promotional materials produced, used by, and representing Wentworth. The circulation of the materials could be worldwide and the Institute does not offer any compensation to students.

Nondiscrimination Policy

Wentworth Institute of Technology reaffirms its policy of providing equal opportunity in education and employment for qualified persons in accordance with federal, state, and local regulations. Wentworth Institute of Technology does not discriminate on the basis of race, color, national or ethnic origin, sex, sexual orientation, religion, disability, age, genetic information, gender identity, veteran status or any other category protected by law in the administration of its hiring and employment policies. No person shall be denied any of the above-stated considerations solely on the basis of being disabled, but otherwise qualified. Wentworth is also committed to equal opportunity in the employment of veterans.

This policy extends to all rights, privileges, programs and activities including admission, employment, educational, and athletic programs and relates in part to requirements of federal law including Title VII of the Civil Rights Act of 1964, Title IX of the Educational Amendments of 1972, Section 504 of the Rehabilitation Act Assistance Act of 1974, and regulations thereunder. If any person has a complaint, it should be taken to the Vice President for Human Resources/Affirmative Action Officer or the Dean of Students, who have established procedures for review. All complaints will be investigated in a prompt and confidential manner. Infractions are subject to disciplinary action, up to and including dismissal.

Notice of Change

Wentworth Institute of Technology reserves the right in its sole judgment to make changes of any nature in its programs, calendar, academic schedule, fees, policies and procedures, whenever it is deemed necessary or desirable, including but not limited to, changes in course content, the scheduling of classes with or without extending the academic term, cancelling of scheduled classes and other academic activities, requiring or affording alternatives for scheduled classes, grading and review of grades, academic standing, probation and dismissals, and procedures applied to such determinations. The policy of Wentworth Institute of Technology is to give advance notice of change, whenever possible, to permit adjustment. However, Wentworth Institute of Technology reserves the right to make any changes from this published information when it is deemed advisable. This catalog is not a contract and cannot be so interpreted.

Rights as an Alumnus/a

All rights possessed as a student remain after leaving Wentworth. These rights apply only to those records that pertain as a student and that are accumulated during enrollment at Wentworth.

Sexual Harassment

Wentworth Institute of Technology strongly affirms its commitment to maintaining a working and learning environment free of sexual harassment. Sexual harassment is a form of discrimination as defined by federal law. The University will not tolerate conduct on the part of any employee, associate, or student which has the effect of:

- substantially interfering with an individual’s work/academic performance
- creating an intimidating, hostile or offensive working/learning environment
- interfering with the educational process
- denying any student equal educational opportunity

The University will react promptly to complaints expressed to the vice president for Human Resources/Affirmative Action Officer, the dean of students (or designee), or Public Safety, who have established procedures for confidential investigation and review.

Storm Cancellation

Whenever inclement weather is a factor, all students, faculty, and staff are encouraged to check the Institute’s website (wit.edu) or their email for information pertaining to the status of the campus.
Additionally, every effort will be made to make an announcement on radio stations WRKO (680 AM) and WBZ (1030AM), and TV stations WBZ (Channel 4), WCVB (Channel 5) and WHDH (Channel 7), as well as Institute social media channels.

When feasible, the decision to remain open, delay the opening, cancel classes, or close the Institute will be made as early as possible. Please do not call Public Safety for this information, as it may detract from their addressing more serious matters.

**Student Right to Know and Graduation Rate**

In accordance with the Student Right to Know Regulations (published in the December 1, 1995 Federal Register, pages 61775 through 61788), Wentworth Institute of Technology discloses its graduation rate. Graduation rates at the University have been rising. The six-year graduation rate for the Fall 2011 cohort is 66%.

**Students Representing Wentworth During Scheduled Class Times**

There are various times when students such as student-athletes, student government officers, and members of the student chapters of professional organizations leave the campus to represent the University and its values. Occasionally, an intercollegiate athletic event, field trip, or professional meeting will conflict with a scheduled lab, class, or examination. In these cases, the student is expected to notify the instructor, in writing, in advance. Faculty should allow the student to make up the missed work without penalty. All students, regardless of the activities they participate in as part of their Wentworth education, are expected to conscientiously complete all assignments in the courses of study.

*The following policy was developed by the Faculty Assembly (now called the Faculty Senate) during the 1984/85 academic years and was approved and implemented that same year. It was subsequently endorsed by department heads and the Athletic Policy Board:*

There are various times when students such as student-athletes, student government officers, and members of the student chapters of professional organizations leave the campus to represent the University and its values. Occasionally, an intercollegiate athletic event, field trip, or professional meeting will conflict with a scheduled lab, class, or examination. In these cases, the student is expected to notify the instructor, in writing, in advance. Faculty should allow the student to make up the missed work without penalty. All students, regardless of the activities they participate in as part of their Wentworth education, are expected to conscientiously complete all assignments in the courses of study. As student-athletes, there will be times where you will have to miss class to compete in intercollegiate athletic events (you may NOT be excused for practices or any activity taking place in the non-traditional season). As a part of the “Student Athlete Code of Conduct,” you are required to sign before you may start practicing, the following is the procedure that must be followed in regards to missing class while representing Wentworth in an athletic contest:

Student-athletes are permitted excused absences for any classes that interfere with a scheduled athletic contest, or travel to and from said contest. Forms, which can be obtained in the Athletic Office, must be filled out and signed by both the student-athlete and a member of the Athletic Department staff no later than 48 hours prior to the class to be missed. These forms are not to excuse a student athlete from a class to go to a practice or for any other reason, and student athletes are encouraged to discuss their season schedule and the possibility of missed classes with their professor(s) at the beginning of the season. Failure to comply with this rule could result in poor academic performance, resulting in ineligibility to compete in intercollegiate athletics.

Student-athletes are encouraged to discuss any and all potential conflicts with her or her professor at the beginning of the semester or season, whichever comes first. Engaging in positive dialogue will only help the professor understand your situation better and help the Department as a whole. The excused absence forms may not be done retroactively.

**Students with Disabilities**

Wentworth Institute of Technology strives to provide students with disabilities equal and integrated access to all academic, social, and recreational programs and activities. Wentworth adheres to the Federal laws set forth in the Rehabilitation Act of 1973 (Section 504) and the Americans with Disabilities Act Amendments of 2008 (ADAAA), which prohibits discrimination against students with disabilities. Section 504 and the ADA define a disability as a “physical or mental impairment which substantially limits one or more major life activities, has a record of such impairment; or is regarded as having such an impairment.” Accessibility Services seeks to ensure that students with disabilities receive support, guidance, and reasonable accommodations.

To be considered eligible for accommodations, a student must schedule an appointment with a counselor in the Accessibility Services, complete the Voluntary Disclosure form (https://wit.edu/student-affairs/voluntary-disclosure-physical-access-needs-form), and submit appropriate documentation of a disability.

Please contact the Center for Wellness at (617) 989-4390 or counseling@wit.edu with any questions regarding student disabilities, or to schedule an appointment.
ACADEMIC RESOURCES

Academic Advising

Academic Advising is a student-centric, campus-wide collaborative effort to support the academic, professional, and personal development of each student. Academic advising empowers students to take responsibility for their own learning and experiences. In essence, the goal of the advising system is to equip students with the tools and resources necessary to negotiate higher education.

Student Advising Outcomes

As a result of the advising experience, students will be able to:

- Demonstrate responsibility for meeting academic goals.
- Identify and utilize on-campus services and opportunities to achieve academic, professional, and personal goals.
- Seek out and incorporate diverse perspectives into academic, professional, and personal goals.

Students are assisted through this process by their Academic Advisors who are faculty and professional staff. Advisors support students as they explore their interests, talents, values, and priorities. They facilitate the connection between a student’s academic experience and future life plans. Advisors for incoming first year students are trained to understand the unique needs of beginning the college journey. Transfer students have a faculty advisor in their program to maximize the application of transfer credits in their program and develop a plan to complete their program in a timely way. In sophomore year, students are transitioned to an advisor in their Major who continues to guide students through their academic experience. In addition, students can consult with an Academic Plan Advisor in the Center for Academic Excellence.

Students are encouraged to discuss academic concerns and seek help from their instructors and advisors as early as possible. In addition, the Center for Academic Excellence provides many resources to help students reach their full learning potential and excel academically.

Academic Plan Advisor

An Academic Plan (AP) Advisor is part of a team focused on student academic success. AP Advisors work with students on their academic plans and ensure completion of graduation requirements. AP Advisors work with students on their goals and success strategies and help connect them to other important Wentworth resources and opportunities. They play a crucial role in facilitating student success.

Primary Advisor

A Primary Advisor counsels students on curricular matters, monitor student academic progress, review academic policies and procedures when necessary, review student course selections prior to registration, and answer questions regarding student career and educational objectives. First-year students are required to meet with their primary advisor to discuss curricular decisions and to obtain a Registration Access Code (RAC / Alternate PIN). They will be introduced to their primary advisor during Wentworth Opening Week (WOW) or within the first few days of classes. Students can find their assigned advisor on Leopardweb.

College of Professional and Continuing Education Advisor

In the College of Professional and Continuing Education, academic advisors are available to assist adult students in reaching their educational goals. Once accepted into the College of Professional and Continuing Education, students will be assigned their own, dedicated academic advisor. Students are encouraged to reach out to their advisor regularly. An academic advisor at Wentworth will help students stay on track with their schedule and address concerns along the way.

Accelerate, Wentworth Innovation + Entrepreneurship Center

ACCELERATE, Wentworth Innovation + Entrepreneurship Center, was conceived as a logical extension of Wentworth’s already existing strengths and disciplines to drive thought partnerships, interdisciplinary engagement, and out-of-the-box ideas among students, alumni, industry, and the Boston community. ACCELERATE aims to build innovative thinking and entrepreneurial confidence in our students.

Since our inception in 2012, more than 6,500 participants have engaged in our programs. ACCELERATE has proven to be a catalyst for encouraging students’ passion and allowing them to develop competencies that will make them successful in their careers, regardless whether they start their own venture, work in a startup, or shape industries in an established company. The experiences and education gained through ACCELERATE will position them for the future.

The Startup Challenge

The Startup Challenge provides a platform for students to form interdisciplinary teams and develop an idea they are passionate about. Student teams have the opportunity to pitch for gap funding and access mentoring to advance their ideas.

The Social Innovation Lab

The Social Innovation Lab is a 12-week interdisciplinary and immersive experience encouraging students to create innovations that matter, solve real-world issues, and work in a high-intensity environment.

Innovation Methodologies

Innovation Methodologies are proactive tools and techniques to inject innovative thinking and entrepreneurial confidence through pop-up workshops in classrooms and around campus.

ThinkTank + CityLab

In collaboration with external partners such as the City of Boston, ThinkTanks and CityLabs are one-day innovation sprints that bring together industry leaders, students, faculty, and community partners across disciplines to tackle future trends, opportunity spaces, and develop real-world solutions.

Center for Academic Excellence

The Center for Academic Excellence (CAE), located in Beatty 402, is open Monday through Friday. Specific hours and a complete list of services can be accessed through the Center for Academic Excellence website at wilt.edu/cae.
The Center for Academic Excellence is available to assist all Wentworth students with meeting their goals for academic success. Our free resources include academic advising and academic support. Academic Plan Advisors are professional who are available to assist students with schedules, academic plans and academic success strategies. The Center also provides appointment-based peer and professional tutoring, study tables, and study groups and collaborates with academic departments to provide Learning Labs and Facilitated study groups. Our peer tutoring services are certified by the College Reading and Learning Association's International Tutor Training Certification program.

Center for Cooperative Education and Career Development (CO-OPS + CAREERS)

Robbin Beauchamp, Director
Wentworth Hall, Room 101
(617) 989-4101
coopsandcareers@wit.edu

Wentworth's Center for Cooperative Education and Career Development (CO-OPS + CAREERS) offers students and graduates a full range of career services, including cooperative education and career advising, career information and resources, graduate school planning, and opportunities to network with employers. The office is located in Wentworth Hall and is open Monday through Friday, 8:15 a.m. to 4:45 p.m., and some evenings.

Advising

CO-OPS + CAREERS Advisors provide career advising to students and alumni at any point in their college or post-college experience. CO-OPS + CAREERS staff help students and alumni research occupational and employment information, establish short- and long-term career goals, explore different career paths, and make informed and purposeful career decisions.

Cooperative Education (Co-op)

As a requirement for graduation, undergraduate day-program students complete two cooperative education semesters, typically one in each of the junior and senior years. Students are responsible for implementing a successful co-op job search, with the support of their CO-OPS + CAREERS Advisor. Students must also adhere to the co-op requirements (https://coopsandcareers.wit.edu/channels/complete-your-co-op) outlined in the Terms & Conditions, a form signed by the student prior to their first co-op. Within specified deadlines, students must register in Leopardweb for COOP3500 or COOP4500 and also gain approval for their Report of Hire form on WITworks (https://wit-csm.symplicity.com/students), an online job-posting and co-op management system. Enrollment in a co-op course (COOP3500 and COOP4500) maintains a student's full-time student status. Enrollment in COOP4699 changes a student's status to less than half-time and does not qualify for financial aid. A student's status at Wentworth could be impacted if they do not successfully find a co-op, meet the co-op requirements, and/or adhere to published deadlines. Typically, students will not take other courses during their co-op semesters. However, in rare occasions, a student may need to do so and must obtain prior approval when registering for additional courses during their co-op semester. co-op overload form (https://wit.edu/ssc/forms) required.

Transfer students must complete at least one semester in residence at Wentworth before being eligible for the cooperative education program.

Students must meet the academic standing of their major to participate.

Students must be in good academic standing to enroll in a co-op. Students not meeting this standard by the end of the semester immediately preceding their co-op term will not be eligible for co-op. These students will be dropped from their co-op enrollment. Wentworth Institute of Technology reserves the right to inform any employer of a change in a student's enrollment status if registered for or on co-op.

Students must meet the co-op requirements as outlined in the Terms & Conditions (https://coopsandcareers.wit.edu/channels/complete-your-co-op) and complete the co-op as detailed in their approved Report of Hire (https://wit-csm.symplicity.com/students). The CO-OPS + CAREERS Advisor conducts a review and determines the grade of either Satisfactory (S) or Unsatisfactory (U). This grade is recorded on the students' academic transcript with no credit assigned and no GPA impact.

Occasionally students enter the baccalaureate programs with substantial work experience in their major field. With the approval of the dean of the college and with consultation from the Director of the Center for Cooperative Education and Career Development, this work experience may be substituted for one of the cooperative education requirements. Students must formally petition to receive this course substitution to the CO-OPS + CAREERS Office. To be considered, this work experience must be at least eight consecutive months of full-time employment, directly related to the students' current major and completed while the student was not enrolled in any academic institution.

Two semesters of optional co-op education are also offered, typically one in the summer prior to junior year for students who have completed all prerequisites for junior year courses (COOP3000) and are in good academic standing, the other (COOP5000) for students who have successfully completed their two required semesters of co-op and obtained permission from their academic department and CO-OPS + CAREERS Advisor. COOP3000 and COOP5000 cannot replace COOP3500 or COOP4500, optional co-ops cannot be substituted for required. Wentworth does not accept co-op experiences from prior institutions.

Co-op Schedule

The required Co-op semesters for each undergraduate program are outlined in the program details specific to each major.

There is no co-op requirement for students in the College of Professional and Continuing Education.

Co-op Institute

This interactive course COOP2500 CO-OP INSTITUTE provides students with the skills and knowledge needed to successfully obtain and keep a co-op position. Students are taught by their CO-OPS + CAREERS Advisor, who supports their individual majors. Students learn about résumé and cover letter development, job search strategies, interviewing skills, professionalism on the job, networking, and how to successfully register for their co-op semesters and report their co-op on WITworks. Students typically take Co-op Institute the semester prior to their first co-op.

Student-athletes and international students are encouraged to take Co-op Institute two semesters prior to their first co-op. This is a graded (S/U) non-credit course.
**Career Tools**

CO-OPS + CAREERS assists students and alumni who seek to explore possibilities that match their career goals, develop job-search competencies and methods to present themselves effectively, obtain information on employment opportunities (full-time and co-op) and prospective employers, connect with employers, and develop and maintain relationships with employers.

Through WITworks, CO-OP + CAREER fairs, and specialized recruiting events, students and employers can connect for co-op and full-time job opportunities.

The ASPIRE@Wentworth program is offered to students who find social interactions, such as interviewing, to be a significant challenge. CO-OPS + CAREERS has partnered with the Massachusetts General Hospital's ASPIRE program to provide personal job coaches to students who need intensive assistance before and during the interviews and during co-op. ASPIRE@Wentworth meets with each student to help them assess the level of assistance they need and provide practice interviewing. To learn more about the program, students can contact their CO-OP + CAREER Advisor. Students need no formal diagnosis to participate in ASPIRE@Wentworth.

Students participate in a variety of professional activities throughout their time at Wentworth. At WITwear, students can borrow professional attire for free, with options available for all genders. All items have been donated by staff, faculty, students, alumni, and employer partners and are dry cleaned after every use. For hours contact the CO-OPS + CAREERS office. WITwear is located in Tudbury Hall, Lower Level, Room #11-020.

Lastly, the CO-OPS + CAREERS staff provides many additional resources to assist students in their co-op search and career development. There are printed resources available in our office and the library, online resources on the CO-OPS + CAREERS website, the award winning WITWorks Radio show, available live and on demand, and the WITSHappening Blog. Numerous resources can be located on the website (https://coopsandcareers.wit.edu).

**Graduate School Planning**

CO-OPS + CAREERS assists students and alumni in obtaining information on graduate/professional schools and preparing for the graduate/professional school application process.

**Douglas D. Schumann Library & Learning Commons**

Beatty Hall Second and Mezzanine Floors  
(617) 989-4040, Text: (617) 600-5989  
Website: http://library.wit.edu/home  
Fenway Library Organization (FLO) (http://libraries.flo.org/home)  
Circulation Desk: circdesk@wit.edu  
Reference Desk: ref@wit.edu  
Facebook (http://www.facebook.com/WITLibrary)  
Twitter/Instagram: @WITLibrary (https://twitter.com/WITLibrary)

**About**

The Douglas D. Schumann Library & Learning Commons is a dynamic, technology-driven space where students and faculty can collaborate and learn. The library is open seven days per week during the semester and offers extended hours during final exam periods. For the most current information about our hours, check the Douglas D. Schumann Library & Learning Commons website (https://library.wit.edu/home).

**Collections**

Our librarians select materials in multiple subjects to meet the curricular, informational, and educational needs of the Wentworth community. The collection includes physical and digital access to books, journals, databases, and multimedia, with new resources added regularly.

**Technology Sandbox**

The Douglas D. Schumann Library & Learning Commons provides access to cutting-edge technology tools in the Lloyd Andres Carney Technology Sandbox. Located on the first level, the Tech Sandbox provides 3D printing and scanning to print 3D models. The library loans technology resources—including digital cameras, 360-degree cameras, Arduinos, and Raspberry Pis—to students and is constantly adding new technology to our lending library. Visit the website (https://library.wit.edu/tech-sandbox) for updates.

**Borrowing**

Materials from beyond Wentworth can also be borrowed through our online FLO catalog, featuring nine other FLO libraries. If something is not available through FLO, we can get it through our Interlibrary Loan service (ILL). Walk-in research assistance is available at the library's Reference Desk.

Wentworth community members who work, own property, or live (even temporarily, as a student) in Massachusetts are eligible to borrow materials from the Boston Public Library. Online registration affords you access to BPL's e-resources, and you may upgrade your privileges to borrow physical materials if you appear in person with proof of your eligibility. Visit the BPL website (https://www.bpl.org) for more information about borrowing. You can also call (617) 536-5400, or email ask@bpl.org.

**Research Help**

Walk-in research assistance is available at the library's Reference Desk. If you need more in-depth assistance with a specific assignment, project, or theme, a one-on-one or group session can be scheduled with a librarian who can offer customized help. The Douglas D. Schumann Library & Learning Commons librarians prioritize helping students learn to identify and evaluate the many information resources that can be found on site, or online, for their careers at Wentworth and beyond. For more information about research help, visit the website (https://library.wit.edu/research-help).

**Study Space**

The Douglas D. Schumann Library & Learning Commons is also a great place to study. With eight high-tech group study rooms, a quiet reading room, and many flexible collaboration areas, you will find a spot that fits your needs, whether you are engaged in interdisciplinary learning with classmates or looking for a solitary space. For more information about reserving study spaces, visit the website (https://library.wit.edu/spaces/study-spaces).

**Fenway Library Organization**

The Douglas D. Schumann Library & Learning Commons is a member of the Fenway Library Organization (FLO), which gives Wentworth students and faculty access to more than three million volumes and numerous
other online databases, resources and services. Presentation of a valid Wentworth ID is all that is needed to use or borrow books at Emerson College, Emmanuel College, Simmons University, Lesley University, Massachusetts College of Art and Design, Massachusetts College of Pharmacy and Health Sciences, Museum of Fine Arts Library, New England Conservatory of Music, New England College of Optometry, Roxbury Community College, Suffolk University, and the University of Massachusetts Boston. Information about the collections in the above libraries (identifying the members of Fenway Libraries Online) is available through the library website (https://library.wit.edu/borrow-and-request/beyond-wit).

Learning Innovation and Technology

Tes Zakrzewski, Director of Learning Innovation and Technology
Beatty 318
(617) 989-4989
lit@wit.edu (wit.edu/dts)
wit.edu/lit

Learning Innovation and Technology (LIT) is dedicated to supporting academic excellence by awakening, nurturing, and empowering all faculty members to be effective educators able to ensure quality student learning at Wentworth Institute of Technology by:

• Delivering flexible, creative, multimodal programs and resources to create transformational learning experiences, and deepen student engagement
• Enhancing faculty’s ability to design and facilitate experiential courses (classroom-based, technology-enabled, hybrid, or fully online) aligned with program and Wentworth goals
• Fostering informal learning and interdisciplinary collaboration among faculty around experiential, project-based teaching, learning, and scholarship

By advancing our mission, participating faculty will, in part, be able to:

• Use effective, dynamic teaching practices that cultivate experiential learning environments
• Reflect on teaching practices for continual development
• Design courses and curricula that maximize course alignment and academic effectiveness
• Use and/or develop appropriate tools and practices for assessing student work
• Collaborate with other faculty to support growth and collegiality

LIT is focused on growing meaningful faculty professional development opportunities and course consulting through formal and informal engagement supported by workshops (face to face, virtual, synchronous, self-paced), online resources, and targeted support for full-time and adjunct faculty.

Technology Services DTS

Tech Spot
Beatty Hall, Room 320
Help Desk (617) 989-4500, helpdesk@wit.edu
wit.edu/dts

The Division of Technology Services supports all aspects of technology at the Institute.

Vision

To provide technologies that will:

• Enrich the experience of Wentworth’s stakeholders
• Enhance the reputation of the Institute
• Facilitate a culture of innovation and creativity through technology

Mission

Build relationships across the Institute to ensure that technology solutions are creating opportunities to improve effectiveness and efficiencies, and are agile enough to facilitate growth, innovation, and creativity.

Divisional Goals

• Operational excellence
• Information security/regulatory compliance
• Customer service
• Collaboration and mobility
• Financial stewardship
• Leadership, partnership, and business enabling

Operational Goals

• Employ best practices in managing technology operations to ensure cost-effective delivery of reliable, scalable services.
• Stability and reliability of core services
• Innovation
• High-quality personnel
• Exceptional planning and project management

Programs of Service

• Administrative and Business Enterprise and local services that support the administrative and business functions of an institution. Includes reporting, descriptive analytics, finance, student information systems, advancement, and conference and event support.
• Communication and Collaboration IT services that facilitate institutional communication and collaboration needs. Includes email, calendaring, telephony/VoIP video/web conferencing, unified communications, digital and web communications, and media/AV services.
• End-Point Computing Services that enable community members to do their day-to-day work, including providing access to enterprise services. Includes network access, user file storage, end-point computing backup solutions, desktop support, computer labs, and printing/plotting.
• Infrastructure-Enterprise level hardware, software, systems, and network infrastructure that provide underlying support for Institute activities. Includes data centers, Internet access, wired and wireless networking, telephony and collaboration tools, central storage and backup solutions, virtual servers, and systems management.
• IT Professional Services that are consultative in nature; these may be a combination of customer-facing and non-customer-facing services. Includes IT training, consulting/advisory services, business continuity/disaster recovery, enterprise architecture, portfolio/project management, business systems analysis, and IT Service Management.
• Security Infrastructure and services that provide security, data integrity, and compliance for institutional activities. Includes services such as virus protection, encryption, privacy impact assessments, risk management, emergency preparedness, data security, access controls (i.e., accounts, passwords), audit and monitoring systems, and stewardship.

• Teaching and Learning management system and academic technology infrastructure and services to support course consulting, meaningful integration of instructional technology, and resources directly supporting face-to-face, hybrid, online delivery. Includes: course design, teaching with technology, engaging students, using Bb Learn, and learning analytics.
STUDENT SERVICES & FACILITIES

Athletics & Recreation
Cheryl Aaron, Director
Nelson Recreation Center Room 202A
(617) 989-4159

Wentworth sponsors 18 varsity sports teams, and offers students the opportunity to participate in intramural, club, and recreational athletic programs. Specific information regarding varsity sports is available in the Athletic Department Office, located on the second floor of the Nelson Recreation Center. Wentworth is an NCAA Division III member and competes in the Commonwealth Coast Conference (CCC) for the majority of its sports. The men’s volleyball team competes in the Great Northeast Athletic Conference (GNAC) and the men’s rowing and men’s indoor track teams are independent.

Varsity Sports
Wentworth sponsors 12 varsity sports for men in baseball, basketball, cross country, golf, ice hockey, lacrosse, rowing, soccer, tennis, indoor track, outdoor track, and volleyball. Six varsity sports for women exist in basketball, lacrosse, soccer, softball, tennis, and volleyball. Schedules, game scores, contact information, and athletics-related news can be found on the Wentworth Athletics website (http://www.wentworthathletics.com).

Intramural and Club Sports
Wentworth offers students the opportunity to compete in several sports—including basketball, flag football, indoor soccer, dodgeball, softball, volleyball, and whiffle ball—through the Colleges of the Fenway (COF) intramural program. A full listing of intramural and club sports offerings is available on the Colleges of the Fenway website and the Wentworth Student Life.

Tansey Gymnasium and Nelson Recreation Center
Tansey Gymnasium and the Nelson Recreation Center contain three standard basketball courts and facilities for volleyball, and similar sports. A fitness center is located on the third floor. Sweeney Field, an outdoor athletic complex on campus, consists of regulation lacrosse, soccer, and softball fields with lighting for evening use.

Center for Community & Learning Partnerships
Erik Miller, Director
553 Huntington Avenue
(617) 989-4993
Website - www.wit.edu/clp
Social Media - Instagram & Twitter: @CLPWentworth (https://twitter.com/CLPWentworth)

Wentworth has a long and rich history of engaging its neighbors, strengthening relationships, and creating long-term partnerships with community residents, organizations, and local public schools. Wentworth encourages students to not only master their area of technical expertise, but also to bring their passion and talents to real-world problems, making a true difference in the community.

As a result of years of faculty, staff, student, and community efforts in response to community needs, Wentworth founded the Center for Community and Learning Partnerships (CLP). CLP provides Wentworth students and community members with a shared experience to help solve the many challenges confronting Boston neighborhoods and its residents. Through CLP, Wentworth creates a platform for students to get involved in community-based projects and programs to positively impact the neighborhoods where students and local residents live, work, study, and play.

Since 2005, CLP has facilitated community-related activities between Wentworth and Boston-based, community organizations; focused on developing, implementing and assessing community engagement and service-learning projects for faculty, staff, students, and alumni; and provided college access programming for Boston youth. In addition to our education activities for Boston youth, CLP has been an advocate for the community voice through community engagement projects and programs. CLP has collaborated with numerous community organizations and nonprofits throughout the City of Boston to help address capital needs and increase capacity building for our partners. These partnerships are maintained and strengthened through several programs run out of CLP:

- Community Work Study (CWS)—CLP partners with local community-based, nonprofit organizations to help build community capital by placing students in real-world, work-based opportunities. All positions are paid.
- Alternative Spring Break (ASB)—A great opportunity for students who want to experience different parts of the country while participating in a week of hands-on, service projects.
- Co+build—An innovative, community-driven design and build program that pairs Wentworth students and faculty/staff experts with both short-term and long-term service opportunities throughout the City of Boston and beyond.
- Volunteer Income Tax Assistance (VITA)—A local organization trains students to become certified tax preparers to help provide preparation services to local residents free of charge.

Service learning projects, like these, can be executed through coursework under the direction of faculty; through participation in student clubs and organizations; through community cooperative learning positions with community organizations; or through the Institute-wide, required senior-year capstone. Students who excel in providing service to organizations throughout Boston are eligible to enroll with CLP to earn a Certificate in Community Learning, a distinction announced during graduation.

CLP is a department of the Office of Community Affairs and External Relations, which is committed to building and maintaining exemplary relationships with the City of Boston, its neighborhood residents, and elected officials.

Information about CLP’s many projects, programs, and resources can be found on the CLP website, through our social media outlets, or by stopping by the office at 553 Huntington Avenue.

Center for Student Engagement
Carissa Durfee, Director
026 Flanagan Campus Center, Beatty Hall
The Center for Student Engagement connects the Wentworth community by providing resources, helping students explore interests, and celebrating the achievements of the student body. The center provides services in many areas to ensure students are successful from the moment they arrive on campus for orientation through the last moments as a student during senior celebrations.

New Student Orientation and Transition Programs

New students begin their transition to Wentworth through two different programs. The first, New Student Orientation (NSO), is a two-day, overnight introduction to the Wentworth community for all first-year students. NSO provides students with the basic knowledge of the campus community, as well as the resources and services Wentworth offers. Orientation programs for transfer and international students are offered later in the summer.

The second component, referred to as Wentworth Opening Week (WOW), is the official welcome program for all first-year and transfer students. Every new student at Wentworth participates in this three-day introduction to college life, which occurs immediately prior to the first day of class. WOW is an Institute-wide initiative that brings all students, staff, and faculty together to help welcome new students and transition them into life at Wentworth. During WOW, students connect with their classmates, receive their laptop, meet with their primary advisor, and learn more about their academic program and campus resources.

First-Year Seminar

First-Year Seminar develops students as engaged learners. The program focuses on the development of positive academic behaviors, assists students in their transition to Wentworth, and supports their personal growth. Through a combination of lecture, discussion, group work and activities, all new students learn about the academic, social, and cultural expectations at Wentworth, and they develop the skills necessary for success at Wentworth.

In addition to teaching the curriculum, instructors serve as a resource to new students, providing transitional and developmental advisement. First-Year Seminar instructors partner with primary advisors to promote academic advising, counsel at-risk students experiencing academic difficulty, and make appropriate referrals as necessary. Instructors also perform outreach to students in their class to assist with personal transition issues.

Student Organizations

Organizations related to majors, social interests, and club sports are all run through the Center for Student Engagement. A complete listing of student organizations may be found on our website (https://wit.edu/student-life/student-orgs). Email studentengagement@wit.edu to find out more about clubs and organizations or for information on how to start your own club. The Involvement Fairs in September and January find representatives from each club sharing more about the offerings. Email studentengagement@wit.edu to find out more about clubs and organizations, or for information on how to start your own club.

Leadership

Students may self-select to participate in the Wentworth Leadership Institute, aimed at developing leadership skills, engaging in the practice of leadership, and offering students the opportunity to develop their own leadership style. This is done through workshops, experiential exercises, and non-credit courses.

Commuter Programs

The Center for Student Engagement provides programs and services to support and enhance the commuter student experience. This includes weekly events held during the day and early evening to accommodate commuter student schedules, discounted MBTA Semester Pass sales, complimentary lockers, and individual outreach. Commuter assistants—who are current, experienced commuter students—create programs to build community, provide resources, and advocate for commuters. Commuter parking passes are available through the Student Service Center. Updated information can be found on Twitter by following @witcommuters (https://twitter.com/WITcommuters).

Programs & Events

Student Engagement hosts a variety of large-scale events throughout the year, including Family and Alumni Weekend, Colleges of the Fenway events, senior celebrations, and the Institute Awards Program. The Wentworth Events Board lists a robust line up of events and activities throughout the year.

Center for Wellness

Maura Mulligan, Director and Assistant Dean of Students
Watson Hall, Room 003
(617) 989-4390

The Center for Wellness provides services to students needing mental health counseling, accommodations for documented disabilities, and education related to wellness. The ultimate objective is to support students in achieving their educational goals.

The Center for Wellness is staffed by professionally trained counselors who are available to discuss personal and mental health concerns with students. Counselors are consulted for a number of reasons, which may include anxiety, depression, sexual assault/sexual violence, problems in relationships, substance abuse, and adjustment to college life. Students may receive services on a short-term basis. When appropriate, students will be referred to a qualified professional in the community who can better meet their specific counseling needs. All services are free and confidential.

The Center for Wellness houses Accessibility Services. It is important to note that Wentworth subscribes to the policies set forth in the Americans with Disabilities Act Amendments Act of 2008 (ADAAA) and in Section 504 of the Federal Rehabilitation Act of 1973, which mandates equal opportunity in educational programs and activities for students with disabilities. Students with physical, medical, psychiatric, and learning disabilities are eligible to access our services to arrange for reasonable accommodations, assistance with advocacy, and liaisons with faculty.

The office is located on the ground floor of Watson Hall, Room 003, and is open Monday through Friday, 8:15 a.m. to 4:45 p.m. Appointments may be made in person or by calling (617) 989-4390. Questions may be emailed to counseling@wit.edu. Night and weekend access to a counselor by phone is provided in partnership with ProtoCall. Students may call (617) 989-4390 and choose option #2 to speak with a counselor when the Center is closed.
In order to be eligible for any of the Federal Aid programs, a student must:

- Be a US citizen or eligible non-citizen
- Be admitted to an eligible program
- Be registered with the Selected Services if male between the ages of 18 and 25
- Not owe a refund or a grant, or be in default status on any federal student loan
- Not have borrowed in excess of the annual aggregate loan limits
- Have financial need as determined by the federal formulas and need analysis guidelines
- Be enrolled at least half time (six credits) for Federal Direct loans per semester
- Maintain Satisfactory Academic Progress (SAP) [See requirements listed in this catalog]

**International Students**

International students are not eligible for federal financial aid, but may be eligible for a limited number of merit scholarships.

**Types of Financial Aid**

**Federal Programs**

Wentworth Institute of Technology is approved by the United States Department of Education for the following aid programs:

- **Direct Federal PLUS Loan**
  - This is a federal loan available for the parents of dependent undergraduate students, and for graduate and professional students.
  - Parent PLUS loans are not based on financial need. A credit check is performed to determine the borrower’s eligibility. A parent may borrow any amount up to the dependent student’s cost of attendance minus the student’s financial assistance. The Direct PLUS loan interest rate is fixed at 7.08% for 2019-20, with a 4.236% loan origination fee. The repayment period for the PLUS loan begins the day the loan is fully disbursed. PLUS borrowers may defer repayment while the student is enrolled at least half-time and for an additional six months after you graduate, withdraw, or drop below half-time. The first payment will be due within 45 days after your deferment ends.

- **Direct Stafford Loan Program**
  - Federal Stafford Loans are either subsidized (the government pays the interest while the student is in school) or unsubsidized (the student pays all the interest, although the payments can be deferred until after graduation). Direct Stafford loans have annual and aggregate loan limits. There are instances when a first-time borrower may lose eligibility for a Subsidized Stafford Loan if he/she has received loans for 150% of their current academic program.

  - The interest rate for Direct Stafford loans is fixed at 4.53% for undergraduate students and 6.08% for graduate students for 2019-20, with a 1.059% loan origination fee. Repayment begins six months after the student graduates, withdraws or ceases to be enrolled on a half-time basis. To receive a subsidized Federal Direct loan, the student must be able to demonstrate financial need. Students who are borrowing for the first time through the Direct Loan Program (subsidized and/or unsubsidized) must complete a Federal Stafford Master Promissory Note (MPN) online and complete an Entrance Interview in order to receive their Federal Stafford Loan funds at the following website (https://www.studentloans.gov/myDirectLoan/index.action). Graduate students are not eligible for the Federal Direct Subsidized Stafford loan.

**Financial Aid**

Anne-Marie Caruso, Assistant Vice President of Enrollment Management and Director of Financial Aid

Student Service Center, Williston Hall, Room 101
(617) 989-4174

Wentworth Institute of Technology is committed to offering financial support to those who qualify for assistance. We encourage all students to apply for financial aid. Wentworth believes that the primary responsibility for meeting your cost of education rests with you and your family. Financial assistance is intended to supplement your own resources.

**How to Apply for Financial Aid**

Financial assistance decisions are made on the basis of financial need, satisfactory academic progress, and the availability of funds. In order to determine your financial need, you must file the Free Application for Federal Student Aid (FAFSA) each year to determine eligibility. This form can be completed online (https://fafsa.ed.gov) any time after October 1. In order to complete this form, a student must apply for an FSA ID. In the case of a dependent student, the parent completing the FAFSA must also apply for an FSA ID.

Students who applied for financial aid the previous year can complete the Renewal FAFSA for the next academic year. The Renewal FAFSA contains pre-printed information based on the previous year. Students must update any information that has changed, such as income, assets, and other related items, if necessary. The Wentworth priority filing date is May 1 for returning students and March 1 for new students.

The federal application (FAFSA) is used to determine your eligibility for all need-based financial aid offered by Wentworth. New students who meet the Wentworth priority filing date can expect to receive a financial aid package in the months of March and April. Returning students who meet their priority filing date will receive a financial aid package in the months of May and June.

**General Eligibility Requirements**

In order to be eligible for any of the Federal Aid programs, a student must:

- Be a US citizen or eligible non-citizen
- Be admitted to an eligible program
- Be registered with the Selective Services if male between the ages of 18 and 25
- Not owe a refund or a grant, or be in default status on any federal student loan
- Not have borrowed in excess of the annual aggregate loan limits
- Have financial need as determined by the federal formulas and need analysis guidelines
- Be enrolled at least half time (six credits) for Federal Direct loans per semester
- Maintain Satisfactory Academic Progress (SAP) [See requirements listed in this catalog]
Federal Pell Grant
This is a federal grant that does not have to be repaid. Eligibility for this grant is determined by the federal government and is based on financial need. The grant amounts range from $652 to $6,195 yearly for 2019-20.

Federal Supplemental Educational Opportunity Grant (FSEOG)
A federal grant that does not have to be repaid. The amount of the award is based on financial need and is determined by a financial formula.

Federal Work Study
This work program provides access to employment on Wentworth’s campus during the academic year and is awarded based on financial need. A student’s total allotment will be outlined on the award letter. A student will receive a bi-weekly paycheck for the hours that the student actually works. Although the student is awarded federal work-study, it is the student’s responsibility to obtain a position on campus.

Veterans Benefits
Veterans planning on enrolling full-time or part-time in credit courses (day, evening, or Saturday) and who are eligible to receive benefits at Wentworth must work closely with the Veterans Administration (VA) certifying official, who is located in the Student Service Center on the first floor of Williston Hall. The official will provide the procedural details for receiving veteran's benefits.

The Yellow Ribbon GI Education Enhancement Program (Yellow Ribbon Program) is a provision of the Post-9/11 Veterans Educational Assistance Act of 2008. This program allows degree-granting institutions in the United States to voluntarily enter into an agreement with the VA to fund tuition expenses that exceed the highest public in-state undergraduate tuition rate. The institution can contribute up to $5,000 of those expenses and VA will also contribute a portion of the tuition.

State Programs
Many states, including Massachusetts, offer state grants, which may be applied to your educational expenses at Wentworth. These grants are based on eligibility, which is determined by the state based on the information provided to them by your FAFSA. Below are the eligibility requirements for the common state grant programs at Wentworth. Please note that, if eligible, these grants will not be added to the student’s account until September of each year. If you do not see your state listed and would like further information, please reach out to that State Grant office. Below are the eligibility requirements for participating states:

Massachusetts
- FAFSA must be completed by May 1 of each year
- Expected Family Contribution (EFC) between 0 and 5486. These may change for the 2019-20 academic year.
- Student must be a Massachusetts resident
- Must be a full-time student receiving a first bachelor’s degree

Vermont
- FAFSA should be filed as soon as possible as funds are awarded on first-come, first-serve basis
- Student must be a Vermont resident
- Student must fill out Vermont State Grant application

Institutional Aid
Graduate Fellowships
This merit-based fellowship is awarded to graduate students upon admission to the Master of Architecture program. No separate application is required. Fellowships are applied toward tuition charges only. The fellowship cannot be combined with any past institutional scholarships received (such as Arioch, Merit Award, and President’s Scholarships) during undergraduate study.

Merit Award Scholarships
This merit-based scholarship is available to all new (freshman and transfer) applicants, and admitted students are automatically considered with no separate application is required. Eligibility is based on a combination of factors, including SAT scores and grades. Students must maintain a 2.5 institutional cumulative GPA as determined by the Satisfactory Academic Progress Policy to retain eligibility for these scholarships in subsequent years and be enrolled full-time. If conditions are not met in any year, the scholarship may no longer be renewable. Merit award scholarships are applied toward tuition charges only. Therefore, any semester in which tuition charges are covered by another scholarship such as ROTC—the Merit award scholarship will be cancelled for that semester. Visit the website (https://wit.edu/billing-financial-aid/scholarships) for information on scholarships.

Wentworth Community Scholarship
Applicants must have demonstrated the highest level of commitment to the Wentworth community through involvement in social, administrative, charitable, and athletic activities while excelling in academics. Students who have completed four semesters and earned 60 semester credit hours with a GPA of 3.0 or better are eligible to apply for this $2,500 per-year scholarship. Students need to reapply each year and be enrolled full-time. Funds from this scholarship are applied toward tuition charges. Visit the website (https://wit.edu/billing-financial-aid/scholarships) for information on scholarships.

WIT Works
The program is designed to give students access to employment that will help them meet living expenses such as books, supplies, and transportation. To receive a WIT Works award, a student must file their FAFSA and demonstrate financial need according to federal guidelines. They must also be enrolled at least half-time in a degree program, maintain satisfactory academic progress, and be either a U.S. citizen or an eligible non-citizen. WIT Work-Study follows all of the same guidelines and policies as Federal Work Study and is need-based.

Endowment Scholarships
Additional endowed scholarships are offered at Wentworth through the generosity of donors. Students need to complete the FAFSA form and a Wentworth Endowed Scholarship application to apply. The application is available in February and is due in June. Students are automatically considered for all scholarships for which they are eligible. Some scholarships have a separate application; information on these scholarships, including application information and deadlines, is available on LConnect.

Financial Aid Satisfactory Academic Progress Policy
The Financial Aid office is required by federal regulations to periodically review the academic progress of financial aid recipients to ensure that they are moving toward the completion of their program of study. A student is considered to be making Satisfactory Academic Progress (SAP) if the student meets both qualitative and quantitative standards described below.
Qualitative Standard
A student must maintain a minimum cumulative grade point average as noted below to be considered as making satisfactory academic progress.

Total Undergraduate Credits Earned: 0-31
Minimum Cumulative Grade Point Average Required For SAP – Undergraduate Day and CPCE*: 1.75
Minimum Cumulative Grade Point Average Required For SAP – Graduate: 3.0

Total Undergraduate Credits Earned: 32+
Minimum Cumulative Grade Point Average Required For SAP – Undergraduate Day and CPCE*: 2.0
Minimum Cumulative Grade Point Average Required For SAP – Graduate: 3.0

*For CPCE Certificate Programs that are Title IV eligible the student must have

Minimum Cumulative Grade Point Average Required For SAP Total Credits Earned 0 -9 credits: 1.75
Minimum Cumulative Grade Point Average Required For SAP Total Credits Earned 10+ credits: 2.0

Quantitative Standard
A student must successfully complete at least 66.67% of the total credits attempted. All attempted credits resulting in either an academic grade or administrative transcript notation may be included in the quantitative calculation.

For example, a student who enrolled and attempted 18 credits in the semester must earn at least 12 credits in order to be making satisfactory academic progress.

In general, coursework that is taken while in attendance at Wentworth Institute of Technology, and applies to the student’s academic program, is taken into account when reviewing satisfactory academic progress (SAP). However, there are some exceptions. Please refer to the information below for a breakdown of how each type of course or credit is treated in the review.

<table>
<thead>
<tr>
<th>Coursework Type</th>
<th>Cumulative GPA</th>
<th>Completion Rate</th>
<th>Maximum Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular courses in a program of study:</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Repeat Courses:</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Transfer Credits:</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Consortium Credits:</td>
<td>N (unless grades are notated in the student's transcript)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Incompletes:</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

A student may receive student federal aid for any attempted credits towards their program of study as long as those credits do not exceed 150% of the published length of the student’s program of study. For example, a student enrolled in an eligible 138 credit baccalaureate program can receive financial aid for up to 207 credits attempted.

Satisfactory Academic Progress (SAP) Review Process
Q: When is my academic progress reviewed?
A: At the end of each semester

Q: Are there warning periods?
A: Yes, there is one warning period

Q: Is there an appeal process?
A: Yes

Q: Can I regain financial aid eligibility once I lose it?
A: Yes

Academic Periods Included in the Review
A student’s Satisfactory Academic Progress (SAP) will be evaluated each semester at the end of the payment period and for all periods of enrollment regardless of whether or not Financial Aid was received. Students who meet SAP standards will be coded as making satisfactory academic progress and will retain eligibility for financial assistance funds for the following semester.

Students who do not meet SAP standards will be placed on SAP warning for one semester. Students placed on SAP warning will retain their eligibility for Student Federal Aid during the warning semester. The student will be notified of a SAP warning by email to their WIT email address followed by a letter to their permanent address.

At the end of the warning period, SAP standards will be reviewed. If the student meets SAP standards, they will once again be coded as making satisfactory academic progress and will retain eligibility for Student Federal Aid for the following semester.

If the student is unable to meet the standards for SAP they will be placed on Financial Aid Suspension and will no longer be eligible to receive financial assistance funds at the institution until such time that they are able to meet the standards of SAP. The student will be notified of a SAP suspension by email to their WIT email address followed by a letter to their permanent address.

Appeal Process
Students who become ineligible for federal student aid due to not meeting the financial assistance standards of satisfactory academic progress may appeal for a review of that determination. A student who believes he or she has extenuating circumstances that affected his or her ability to progress satisfactorily should appeal utilizing the appeal application within 30 days of the date of the letter indicating a loss of financial aid eligibility. Examples of cases that may be considered are as follows:

- Student becomes seriously ill
- Student’s relative dies
- Student is severely injured

Other cases may be considered and are reviewed on a case-by-case basis. The appeal should be addressed to the Financial Aid Appeals Committee and be submitted to the Financial Aid office. The appeal should include a completed appeal form (https://wit.edu/ssc/forms), a letter to the Financial Aid Appeals Committee requesting a reevaluation of the student’s aid eligibility. The letter should include an explanation of the student’s past academic performance and the reason the student’s
aid eligibility should be reinstated. Additionally, the student must submit an approved academic plan from their academic advisor.

An appeal may be approved only if

- Wentworth determines that the student will be able to meet SAP standards after the subsequent semester; or
- the student has an approved academic plan that will ensure that the student will be able to meet SAP standards by a specific point in time or successfully complete their academic program.

Appeals will be reviewed by the Financial Aid Appeals Committee for reconsideration based on extenuating circumstances presented by the student. Decisions by this committee are considered final. If the appeal is approved, the student will be placed on financial aid probation and will have one semester (or time as specified by the approved academic plan) to meet SAP requirements and remain eligible for financial aid.

Other Important Considerations

Change of Program
A student who changes their academic program may request an appeal in that determination if he or she has changed programs while enrolled at their current school. All courses attempted will be evaluated for the maximum time frame component.

Co-op
Unsuccessful completion of a required co-op impacts SAP, whether the student withdraws from the co-op or receives a “U” grade. A student who does not successfully complete a required co-op will be placed on SAP warning or SAP suspension depending upon the SAP standing with which the student started the semester.

Consortium Credits
All courses taken at an institution other than the home institution through an official consortium are included in the calculation for completion rate and maximum time frame components, but may excluded from the student’s cumulative GPA component (unless grades are noted in the student’s transcript).

Course Withdrawal
Course withdrawal may affect a student’s eligibility for financial assistance funds.

Incomplete Grades
All incomplete grades must be resolved by the midpoint of the semester following the receipt of the incomplete grade. If not resolved, the grade is either automatically changed to an “F” or is considered to be an “F” for all components of the satisfactory academic progress review. Financial assistance funds can be withheld until incomplete grades are resolved.

Repeat Courses
Only the most recent grade for a course that has been repeated will count toward a student’s cumulative GPA. Therefore, grades from prior attempts will be excluded from the student’s cumulative GPA. However, all attempts, including the most current, will be included in the calculation for the completion rate and maximum time-frame components. Financial assistance funds will cover a repeated course only when it is repeated to replace an unacceptable grade as determined by a specific course and/or major.

Transfer Credits
Credits that are transferred in from another institution and apply to the most current major will be excluded from the student’s cumulative GPA. However, they will be included in the calculation for the maximum time-frame component and the completion rate components.

Remedial Course Credits
Remedial course credits approved by the student’s academic department and attempted are included in the calculation for completion rate, cumulative GPA and maximum time-frame components.

Treatment of Federal Financial Aid When a Student Withdraws
The US Department of Education requires Wentworth Institute of Technology to maintain and disseminate a written policy regarding federal financial aid recipients who withdraw or otherwise fail to complete the term for which their financial aid was disbursed.

Federal financial aid funds are awarded to a student under the assumption that the student will attend school for the entire period for which the assistance is awarded. When a Federal financial aid student withdraws, the student may no longer be eligible for the full amount of Federal financial aid funds that the student was originally scheduled to receive.

Up through the 60% point in each semester, a prorata schedule is used to determine the amount of Federal financial aid funds the student has earned at the time of withdrawal. After the 60% point of the semester, federal regulations affirm that a student has earned 100% of the Federal financial aid funds he or she was scheduled to receive during the semester. For a student who withdraws after the 60% point-in-time, all funds are earned.

If the recipient of a Federal grant or Federal loan withdraws from school after beginning attendance, the amount of the Federal grant or Federal loan assistance earned by the student must be determined. If the amount disbursed to the student is greater than the amount the student earned, unearned funds must be returned.

Withdrawal Procedure
Students who wish to withdraw from Wentworth are required to submit a completed Voluntary Withdrawal Form (https://wit.edu/ssc/forms) to the Registrar’s Office. If you live in a residence hall, you must meet with the Resident Life Staff and submit the appropriate forms.

Withdrawal Date and Calculation of Earned and Unearned Federal Financial Aid
For purposes of this policy, the date of withdrawal will be the date the student begins the withdrawal process or the date, as determined by Wentworth, that the student otherwise notified Wentworth in writing or verbally, of their intent to withdraw to zero credits.

The amount of aid earned is calculated by dividing the number of calendar days from the beginning of the term of the point of withdrawal by the total number of days in the term. This percentage is multiplied by the amount of federal financial aid that was awarded and accepted for the term and becomes the amount of aid that was earned. This amount is subtracted from the amount of aid disbursed and the balance becomes the amount of unearned aid that must be returned.

Wentworth determines that the student will be able to meet SAP standards after the subsequent semester; or
Responsibility for repayment of these funds will be shared by Wentworth and the student, per policies and procedures contained within the federal formula for proration of refunds of unearned Federal Financial Aid.

**Post-Withdrawal Disbursements**

A student may be eligible for a post-withdrawal disbursement if the amount of earned aid is less than the disbursed aid. Students will be notified at the point of withdrawal if they are eligible for a post-withdrawal disbursement as determined by the Financial Aid Office.

**Distribution of Unearned Federal Financial Aid**

In compliance with federal regulations, a school must return Federal financial aid funds to the programs from which the student received federal aid during the payment period or period of enrollment as applicable, in the following order, up to the net amount disbursed from each source:

- Unsubsidized Federal Direct loans
- Subsidized Federal Direct loans
- Federal Perkins loans
- Federal Direct PLUS loans
- Federal Pell Grants
- Federal Supplemental Educational Opportunity Grants (FSEOG)

Federal Work-Study funds paid to recipients will not be included in the computation of earned Federal financial aid, nor will these funds be refunded to the federal account from which they were paid.

Unearned Federal grant and Federal loan funds due from WIT will be repaid to the federal accounts for the specified semester. Unearned portions of Federal grant aid due from the student will also be repaid to the federal accounts by WIT. All repayments made by WIT pursuant to this policy will be charged to your student account. Any refund amount above the amount of unearned aid will be returned to the federal aid programs per the distribution of Unearned Federal Financial Aid schedule.

**Unofficial Withdrawals**

Federal Regulations require that an institution must have a procedure in place for determining whether a Federal financial aid recipient who began attendance during a payment period completed the period.

For students enrolled in 15-week courses, if a student earns a passing grade in one or more of his or her classes offered over an entire period, for that class, WIT will presume that the student completed the course and thus completed the period of enrollment.

For students enrolled in 7-week courses, the student is considered to have withdrawn for Title IV purposes if the student ceases attendance at any point prior to completing the payment period.

Return to Title IV Calculation Example

**15-week semester** - A payment period start date is September 9 and the end date is December 12. The total days for the payment period is 98 days. The student withdraws on October 1 which is day 26 of the payment period. The percentage of earned aid would be 26.5% (26 days/98 days) and the unearned aid percentage is 73.5%.

- If the student received $5,500 in Title IV aid, then the student earned $1,457.50 in Title IV aid and $4,042.50 is the unearned amount.
- If institutional charges are $6,000, then the amount of earned charges would be $1,590 and the unearned charges would be $4,410.
- WIT is responsible for returning the lesser of the unearned institutional charges or the total amount of unearned Title IV aid, so WIT would return $4,042.50 in this example. The student is responsible for immediate payment of this account balance.

**7-week sessions** - A payment period start date is January 9 and the end date is April 21. Session One starts on January 9 and ends on February 24. Session Two starts on March 6 and ends on April 21. There is a 9-day break between Session One and Two. The total days for the payment period is 94 days (47 days in each session)

The student is registered for a course in Session One and a course in Session Two. The student earns a B in Session One and then withdraws on March 7 which is day 49 of the payment period. The percentage of earned aid would be 52.1% (49 days/94 days) and the unearned aid percentage is 47.9%.

- If the student received $5,500 in Title IV aid, then the student earned $2,865.5 in Title IV aid and $2,634.50 is the unearned amount.
- If institutional charges are $6,000, then the amount of earned charges would be $3,126 and the unearned charges would be $2,874.
- WIT is responsible for returning the lesser of the unearned institutional charges or the total amount of unearned Title IV aid, so WIT would return $2,634.50 in this example. The student is responsible for immediate payment of this account balance.

Return of Title IV funds requirements DO apply to a student who:

- Officially withdraws during a payment period; or
- Unofficially withdraws during a payment period (student stops attending without providing notification to the University); or
- Ceases attendance during a payment period; or
- Graduates during a payment period.

Return of Title IV funds requirements DO NOT apply to a student who:

- Withdraws from some classes but remains enrolled in other courses during the same payment period at WIT; or
- Never attended any classes, or for whom WIT cannot document attendance in at least one class for the payment period or period of enrollment. If the student never attended any classes or WIT cannot document the student's attendance in at least one class, the student did not establish eligibility for Title IV aid for the period and all funds must be returned.

**Health Services**

Massachusetts College of Art and Design
Optum Health Center
578 Huntington Avenue
(617) 879-5220

Optum Health Center is open weekdays from 9:00 a.m. to 6:00 p.m. year-round. Please call (617) 879-5220 to schedule an appointment.

Wentworth students have year-round after-hours urgent care access at Atrius Health Care in their Kenmore Square location, 133 Brookline Avenue, when the Optum Health Center is closed. Such hours would include weekday mornings from 8:00 to 9:00 a.m., weekday evenings from 6:00 to 8:00 p.m., Saturdays from 10:00 a.m. to 5:00 p.m., and Sundays and holidays from noon to 5:00 p.m.

Students are strongly encouraged to register as a patient with Optum Health Services before their first appointment. Please identify yourself as a Wentworth student, and have your insurance information (i.e. insurance card) available.

Optum Health Services will bill students’ insurance plans for all services rendered. Students attending appointments at the Optum Health Center will not need to pay the standard co-pay. Students must present their student identification cards and health insurance cards at every appointment.

Optum Health Services respects student confidentiality under the HIPPA laws. No health information is released to parents or college staff without the student’s written authorization unless required by law or in a life-threatening situation. For additional information about Optum Health Services, visit our website (http://wit.edu/health-services).

Medical advice is also available to students during times when the Optum Health Center Office is closed by calling (617) 879-5220.

In the case of a life-threatening emergency, students should immediately contact Wentworth Public Safety at (617) 989-4444.

Housing & Residential Life

The Office of Housing and Residential Life (OHRL) promotes a safe and inclusive residential community that supports student success through intentionally designed programs and services.

Wentworth accommodates more than 2,200 students in fifteen (15) residential buildings that are organized into seven communities.

- **Baker Hall** is a traditional-style residence hall that houses first-year students in double bedrooms, and shared-floor showers and bathrooms. The five floors in Baker Hall provide a community atmosphere with frequent opportunities to interact with other students. The building has community lounges for group studying or socializing. Included in every room is a bed, desk and chair, and wardrobe.

- **Evans Way Hall/Tudbury Hall** is a first-year student residence hall comprised of suites accommodating four (4) to twelve (12) students. Each suite contains a central living room, one to two bathrooms, and two to four bedrooms. This community also has a study room, exercise room, and multi-purpose auditorium.

- **The Apartments @ 525** houses upper-class students in apartments of four (4) to five (5) people. Seventy percent (70%) of the bedrooms are singles, and each apartment has a common area, kitchen with a dishwasher, bathroom, and washer/dryer. The building also features a bicycle storage room and public meeting rooms. Included in every room is a bed, desk and chair, and closet.

- **610 Huntington Avenue** houses upper-class students in apartments with double bedrooms, a common area, kitchen, and bathroom. Included in every room is a bed, desk and chair, and wardrobe. The building also features an exercise room, a large lounge, a billiard/game room, and a meeting/study area.

- **555 Huntington Avenue** houses upper-class students in apartments ranging from four to nine students in single, double, and triple bedrooms. Included in every room is a bed, desk and chair, and wardrobe. All apartments have a kitchen area, a common area, and bedrooms. Each floor has a lounge/study area.

- **Edwards/Rodgers Apartments** houses upper-class students in two-person studios and three-person, one-bedroom apartments. Non-studio apartments contain a kitchen and dining area, bathroom, living room, and bedroom. Studios consist of rooms comprised of a living space and bedroom. Included in every apartment is a bed, desk and chair, and closet.

- **Louis Prang/Vancouver Apartments** are available for upper-class students. These apartments offer a variety of living arrangements from studio apartments to multiple-person apartments. All units have kitchen and bathroom facilities and provide an off-campus apartment feel with the convenience of living on campus. Included in every room is a bed, desk and chair, and closet.

Each of the residential communities is coeducational and overseen by a building staff, which includes a live-in professional staff member (assistant director, resident director, and/or assistant resident director) and student resident assistants. Building staff are responsible for creating an inclusive, welcoming, educational and purposeful community that focuses on personal and social student development. If students have questions or concerns about their living situation, they are encouraged to seek the help of the resident assistants or the professional staff members who oversee their residential community.

For more information, follow us on Facebook (https://www.facebook.com/WITLife), visit our website (http://wit.edu/reslife), email housing@wit.edu, call (617) 989-4160, or visit the Housing and Residential Life Office located in The Apartments @ 525, room 101.

International Student Services

Jeanmarie Ambrose, Director
Student Service Center
Phone: (617) 989-4391

Dena Reuben, Assistant Director
Student Service Center
Phone: (617) 989-4680

International Student Services (ISS) staff members are available to assist international students in maintaining their legal non-immigrant status in the United States (U.S.) and strive to ensure that students experience a smooth transition to life in the U.S. through International Student Orientation and other programs throughout the year. ISS is available to assist students individually in their personal, social, and academic adjustment to Wentworth and the U.S.

ISS is the source of information at Wentworth regarding the regulations and policies of the U.S. government as they pertain to international students. Any international student with questions regarding his or her F-1 Student status should contact ISS to obtain an analysis of, and recommendations for, his or her specific situation. ISS will address
questions related to employment, maintaining valid status, obtaining a new visa or Form I-20 and any other related topic.

It is the responsibility of each student to maintain his or her valid status in the United States. Student and Exchange Visitor Information System (SEVIS) records of international students are maintained through ISS in order to provide information to Immigration and Customs Enforcement (ICE) on each student as required by law.

Public Safety
William Powers, Director
610 Huntington Avenue
(617) 989-4400

The 24-hour Public Safety Office is located at 610 Huntington Avenue on the first level of the residence hall. The department provides 24-hour police, medical, and security services to the campus community. Public Safety assistance or safety escorts may be obtained by calling (617) 989-4400 or activating an information/emergency call box located throughout campus. In case of an emergency, call (617) 989-4444.

We strongly encourage all community members to promptly report criminal and suspicious activity, potential threats to the community, and other emergencies to the Department of Public Safety.

Reserve Officers Training Corp

Air Force
Air Force Reserve Officers Training Corps (ROTC) is an educational and leadership program designed to provide young men and women the opportunity to become Air Force officers while completing a bachelor’s or master’s degree. The Air Force ROTC program prepares students to assume challenging positions of responsibility and importance in the Air Force.

Through a cross-enrolled program with Boston University, interested Wentworth Institute of Technology students may participate in the Air Force ROTC program. Requirements include yearly aerospace studies classes, leadership laboratory classes, and physical fitness training. Mandatory weekly time commitments range from five to seven hours. Once students complete their degree, the Air Force offers a wide variety of career fields from which to choose including flying opportunities as a pilot, navigator, or weapons controller. The Air Force has opportunities for students primarily in engineering majors. In addition to leadership and management training, cadets can benefit from several scholarship programs.

Students interested in joining the Air Force ROTC program or wanting more information should contact:

Department of Aerospace Studies, Boston University
118 Bay State Road
Boston, MA, 02215
or at 617-353-6316

Classes are held at Boston University. A student can also visit the detachment website (http://www.bu.edu/af-rotc).

Army
Army ROTC has been a part of Wentworth’s curriculum for many years. Sponsored through Northeastern University, ROTC offers three-year and four-year Army officer training programs that complement Wentworth’s educational program.

General Objectives
The Department of Military Science of Northeastern University administers the ROTC program for Wentworth students. Army ROTC provides leadership training on campus and leadership exercises at local off-campus training sites. The goal of the program is to commission the future officer leadership of the United States Army.

Courses of Study
The Army ROTC program consists of two phases: the basic course (freshman and sophomore years for five-year program students; freshman year for four-year program students), which incurs no obligation on non-scholarship students; and the advanced course (taken during the remaining years of the academic program). Eligibility for the advanced course is conditional upon satisfactory completion of the basic course or its equivalent. Participation in the basic course provides students with an excellent opportunity to decide if they wish to become Army officers.

Army Financial Assistance
1. Wentworth cadets can apply for a ROTC scholarship in their freshman or sophomore years. Scholarship benefits are awarded up to $25,000 per year to be used toward tuition and mandatory fees not related to room and board.
2. Every scholarship recipient receives up to $1,200 per year for books and supplies, and a monthly stipend of $420 while in school.

Wentworth Financial Assistance
Wentworth students who receive military scholarships from the Army ROTC programs will be granted a room scholarship for each year the military scholarship is in effect. Recipients should notify the Office of Financial Aid.

Army Commission and Service Requirements:

- Basic course (freshman/sophomore) cadets, who are not scholarship recipients, do not incur any military obligation, and may withdraw from the program at any time.
- Any contracted cadets agree to accept an Army commission and serve on either active duty (full-time) or reserve duty (part-time) with duty in the Army Reserve or the National Guard (one weekend each month and two weeks each year).
- The commitment requirements are three (3) one-hour morning physical training sessions per week, one to three hours of class per week, a one-and-a-half-hour weekly leadership laboratory session, and one weekend field training exercise per semester.
- Cadets will be commissioned as second lieutenants and fulfill an eight-year service obligation with active duty, or reserve, or a combination thereof.

Interested students should contact:

CPT Vincent Mullen
Northeastern University
335A Huntington Avenue
Boston MA 02115
(617) 373-2375
Through the Office of Student Affairs, students can:

- Transition into college life.
- Experience illness or injury, experiencing financial hardships, or difficulties with the enforcement of the Student Code of Conduct.
- Receive assistance with long-term absences from the Institute (including hospitalization, bereavement, religious observance, etc.) and submitting an Absence Notification Request (https://wit.edu/student-affairs/absence-notification-request)

Additionally, the Office of Student Affairs oversees compliance and enforcement of the Student Code of Conduct throughout the Wentworth community.

Student Affairs
Rubenstein Hall 003
(617) 989-4702
osa@wit.edu
wit.edu/student-affairs
sites.wit.edu/witdeans/

The Office of Student Affairs acts as a resource, referral agent, and advocate for students so they may live and learn successfully throughout their Wentworth experience. Staffed by the vice president for student affairs/dean of students, associate vice president for student affairs/associate dean of students, assistant dean of students, coordinator of community standards, care specialist, and assistant to the deans, the Office of Student Affairs provides advice or support on academic or personal matters, assisting students in accessing the resources and solutions they need. In the past, Student Affairs has helped students with such concerns as missing a significant number of classes due to illness or injury, experiencing financial hardships, or difficulties with the transition into college life.

Through the Office of Student Affairs, students can:

- Receive support for personal, financial, or academic matters.
- Receive assistance with long term absences from the Institute (including hospitalization, bereavement, religious observance etc.) and submitting an Absence Notification Request (https://wit.edu/student-affairs/absence-notification-request)
- Obtain a Wentworth Student Planner
- Receive information about the Student Emergency Fund
- Access the Wentworth Supply Closet
- Speak with a member of our staff to share a concern about another student
- Bring forward a Title IX complaint (https://wit.edu/notalone)
- Seek assistance to request a Medical Leave of Absence
- Receive support in the fulfillment of Jury Duty
- Receive assistance with Student Code of Conduct violations
- Receive information regarding the Family Educational Rights and Privacy Act (FERPA)

Student Affairs oversees the following departments: Athletics, Center for Cooperative Education + Career Development, Center for Diversity & Social Justice Programs, Center for Student Engagement, Center for Wellness, Fitness and Recreation, and Housing and Residential Life.

Additionally, the Office of Student Affairs oversees compliance and enforcement of the Student Code of Conduct (https://wit.edu/student-code-conduct) throughout the Wentworth community.

Student Financial Services
Patricia Osgood
Director, Student Financial Services
Student Service Center, Williston Hall, Room 101
(617) 989-4020

Tuition, Fees, and Other Expenses
Fees and Deposits
Application Fees
Students in Undergraduate, Master of Science, and College of Professional and Continuing Education (CPCE) programs must submit a $50 fee with their application to Wentworth Institute of Technology.

Tuition Deposits
New undergraduate students entering in the fall semester must pay a $250 tuition deposit by May 1. Deposits are non-refundable after May 1. New undergraduate students entering in the spring must make a $250 tuition deposit, which is non-refundable.

New graduate students must pay a non-refundable tuition deposit of $250 following notification of acceptance. Please note that the College of Professional and Continuing Education (CPCE) does not require a deposit.

Housing Deposits
Any day program or Master of Architecture student who requests to live on campus for the fall and spring semesters must make a $500 down-payment (deposit). For new undergraduate students, the down-payment is non-refundable after May 1. For all other students, deadlines will be published by the Office of Housing and Residence Life. New students starting in the spring who request to live on campus must also make a $500 down-payment, which is non-refundable. Down-payments will not be accepted from students who owe a balance for the current or prior semester(s).

Students planning to live on campus for periods other than the fall and spring semester also pay a housing down-payment based on the semester(s) they intend to live on campus. These rates will be announced by the Office of Housing and Residence Life.

For returning students, housing down-payment refund requests received in writing (or email) and postmarked before the start of room selection will be granted. No verbal requests will be honored.

All housing down-payment refund requests must be emailed to housing@wit.edu or in writing to:

Director of Housing and Residential Life
Wentworth Institute of Technology
550 Huntington Avenue
Boston MA 02115

Tuition
At the discretion of the Institute, tuition and fees are subject to change at any time.

- Day Undergraduate: Full-time tuition (annual based on two semesters) – $34,970; per credit $1,095
- College of Professional and Continuing Education (CPCE): per credit $475
- Master of Architecture: Full-time tuition (annual based on two semesters) – $37,700; per credit $1,045
The standard fee for health insurance for the 2019-2020 academic year is $2,409.00

**Parking**
- Day (Commuter) Pass - Cost per Semester: $250.00
- Applicate Lots and Times: Annex, Parker, Sweeney (7:00 a.m. – 10:00 p.m.); West (3:00 – 10 p.m.)
- Evening and Weekend Pass - Cost per Semester: $100.00
- Applicate Lots and Times: Annex, Sweeney, West (3:00 – 10:00 p.m. M-F; 7:00 a.m. – 10:00 p.m. Saturday)
- Overnight (On-campus residents only) - Cost per Semester: $500.00
- Applicate Lots and Times: Annex, East (overnight)

Students must be financially clear to purchase parking passes. Passes are sold on a first-come, first-serve basis, and must be paid for at the time of purchase. Students cannot use an anticipated credit balance to purchase a parking pass.

Overnight parking passes are sold only to junior, senior or master's students. A limited number of passes are available each semester.

**Books, Supplies, and Equipment**
Each student provides at his/her own expense the necessary textbooks, equipment, and instructional supplies. The cost of books and supplies is estimated at $800 to $1,200 per year. Costs will vary depending upon the curriculum and whether new or used books are purchased. Payments for books and supplies purchased at the Wentworth bookstore are made directly to the bookstore, located in the basement of the Flanagan Center, and accessible online through the LConnect Campus Services tab.

Wentworth provides all full-time undergraduate day freshmen with a laptop computer outfitted with the software used in their academic programs. Students are required to graduate from Wentworth in order to keep the laptop. Students who withdraw voluntarily or who are academically withdrawn must return the laptop or be charged a recovery fee. Information on Wentworth's laptop program may be found on our website (http://wit.edu/laptop).

**Sibling Discount**
Wentworth Institute of Technology is pleased to offer a tuition discount to siblings who are enrolled concurrently in traditional day undergraduate degree programs, as specified below. The sibling discount only applies to tuition charges. To qualify for the discount, all siblings must be matriculated and enrolled full-time, in a day undergraduate program, for each period (semester) of eligibility:

- 10% tuition discount per student for the first and second siblings, enrolled concurrently
- 20% tuition discount for the third and additional siblings, enrolled concurrently

The sibling discount does not apply to, and, if applicable, will be removed in the following situations:

1. One of the siblings “walks away,” withdraws, or graduates from Wentworth.
2. One of the siblings enrolls in the Master of Architecture program while the other sibling is enrolled as an undergraduate.

One sibling must complete the sibling discount application form (https://wit.edu/ssc/forms), and return it to the Student Service Center.
Payment Information
Wentworth Institute of Technology is partnering with a third-party service provider called CASHNet SmartPay to process all credit and debit card payments to student billing accounts. Payments can be made online through our eBilling system using MasterCard, Visa, Discover, or American Express credit cards or debit cards. CASHNet SmartPay will assess a non-refundable 2.75% convenience fee on each domestic transaction (4.25% non-refundable convenience fee for each international transaction). Wentworth will continue to offer other payment methods, including paper checks and electronic check payments (ACH), which carry no additional charge. Wentworth will no longer accept credit card or debit card payments over the telephone or at the cashier stations for student billing accounts in the Student Service Center. However, we will provide computer stations in the Student Service Center for use by students and parents.

Students in undergraduate day programs and the Master of Architecture program are billed prior to the start of each semester they are expected to attend. Bills are electronic only, and can be accessed through Leopardweb. Payment is due approximately one month prior to the start of the semester.

Students in CPCE undergraduate, certificate, and workforce development programs, and students in the Master of Construction Management, Master of Facility Management, or Master of Technology Management, will be billed within 24 hours after they register. The bill due date is the last day of the official add/drop registration period. Many students in these programs are also eligible to participate in the 3-Payment Plan. Please contact the Student Service Center at (617) 989-4020 or (800) 222-9368 for details.

All students must pay for each semester’s classes by the due date or the class schedule will be canceled due to non-payment.

Alternative Payment Options
Monthly Payment Plan
Undergraduate and Master of Architecture students have the option to enroll in a monthly payment plan. Wentworth partners with an outside provider, Tuition Management Systems (TMS), to offer yearlong or semester payment plans. TMS charges a one-time enrollment fee, and all plans are interest free. For more information, please contact the Student Service Center at (617) 989-4020 or (800) 222-9368.

3-Payment Plan
The "3-Payment Plan" is available to eligible CPCE degree seeking students and for individual non-credit courses with semester tuition greater than $1,000. The payment plan is only offered at the beginning of each semester. Students enrolled only for the second seven-week session courses are not eligible for the 3-Payment Plan. Students must enroll online through the e-bill, and the first payment is required at the time of registration. Students are required to enter payment information for automatic payment for the second and third payments.

The second and the third payment due dates are published on the e-contract and will be automatically charged to your account. If payment cannot be processed in accordance with the schedule, a late payment fee of $50 may be assessed for each late/missed installment. Students who fail to meet these terms will not be eligible to participate in this plan for future semesters. Students who were referred to outside collection agencies in the past or have more than two late fees on their account may not qualify for payment plans and must pay in full by the due date.

The Student Financial Services staff reserves the right to deny enrollment in the 3-Payment Plan.

Directions for enrolling in the 3-Payment Plan can be found online.

Registration Cancellation for Non-Payment
Students who have not paid their accounts in full by the tuition due date, completed required financial aid paperwork, or have not made payment arrangements with Student Financial Services, class registration and/or housing assignments may be cancelled for non-payment.

If a student’s class registration and/or housing assignment is cancelled for non-payment, the student may re-register for classes, depending on class availability and provided appropriate payment arrangements are made.

If a student’s housing assignment is cancelled, there is no guarantee that the student will receive on-campus housing.

Returned Check
A $30 fee will be placed on the student’s account for any check returned to Wentworth by the bank. This fee may not be reversed. The Student Service Center will not accept a personal check, including web checks, if there have been two (2) returned checks on a student’s account. Wentworth also reserves the right to refuse checks for a past-due balance, to request a transcript, or for payments made within two (2) weeks of graduation.

Late Payments and Delinquent Accounts
Failure to pay a student’s account balance in full on or before the bill due date (see Payment Information section) will result in cancellation of a student’s class schedule as well as a student’s housing assignment (if applicable). Wentworth reserves the right to charge a $100 late fee to any past due account balances. A student whose account shows an outstanding balance will not be allowed to register or attend classes for future semesters.

Wentworth reserves the right to hold diplomas, grades, and transcripts from all students who have not paid all bills due the Institute. It is a Wentworth policy that only those students who have met all the academic and financial requirements for graduation may participate in the graduation ceremony.

Wentworth reserves the right to refer any delinquent account balance to an outside collection agency. Once the account is referred to an outside collection agency, a collection fee, which could be up to 40% of the principal balance, will be added to the student’s total account balance. If the agency decides to pursue litigation on the outstanding balance, students will also be liable for any additional late fees, interest, or legal fees incurred.

Credit Balance Policy
Institutional and federal financial aid will disburse to student accounts approximately four weeks into the term if all the financial aid requirements are complete. Typically, there will not be a credit balance until all institutional and federal aid disburses. Once this occurs, and if it creates a credit balance, any remaining credit will be refunded as follows:

- If a credit balance is a result of federal Stafford loans, alternative loans, and/or grants, the refund will be issued to the student based on the refund option they choose.
Tuition and fees will not be adjusted until the Student Service Center are liable for all tuition and fees assessed for that semester. Students who do not notify Wentworth of their intention to withdraw from classes, made based solely on lack of attendance, do not constitute an official withdrawal, and no adjustments will be issued. A student who withdraws within the first four weeks of the semester is student who withdraws after the first four weeks of the semester, the student will be responsible for the entirety of the board plan charged. A student's room and board charges are determined by the date which the student files voluntary withdrawal paperwork with the Student Service Center. Non-attendance of classes does not constitute an official withdrawal, and no adjustments will be made based solely on lack of attendance. Students who register for classes, fail to appear for those classes, and who do not notify Wentworth of their intention to withdraw from classes, are liable for all tuition and fees assessed for that term. Tuition and fees will not be adjusted until the Student Service Center receives the official withdrawal request (https://wit.edu/ssc/forms) from students. Withdrawal forms (https://wit.edu/ssc/forms) received after the proration period will not initiate adjustments. Adjustments are made as follows:

For 15-Week Courses:
- If withdrawal is filed by the end of the drop/add period, tuition reversal amount is 100%, minus non-refundable $250 deposit, if applicable.
- If withdrawal is filed by the end of the second week of the semester, tuition reversal amount is 75%.
- If withdrawal is filed by the end of the third week of the semester, tuition reversal amount is 50%.

Tuition Adjustments
Tuition adjustment for a withdrawing student is initiated based on the point in the semester at which the student files voluntary withdrawal paperwork with the Student Service Center. Non-attendance of classes does not constitute an official withdrawal, and no adjustments will be made based solely on lack of attendance.

Students who register for classes, fail to appear for those classes, and who do not notify Wentworth of their intention to withdraw from classes, are liable for all tuition and fees assessed for that semester. Tuition and fees will not be adjusted until the Student Service Center receives the official withdrawal request (https://wit.edu/ssc/forms) from students. Withdrawal forms (https://wit.edu/ssc/forms) received after the proration period will not initiate adjustments. Adjustments are made as follows:

For 15-Week Courses:
- If withdrawal is filed by the end of the drop/add period, tuition reversal amount is 100%, minus non-refundable $250 deposit, if applicable.
- If withdrawal is filed by the end of the second week of the semester, tuition reversal amount is 75%.
- If withdrawal is filed by the end of the third week of the semester, tuition reversal amount is 50%.

For Six- or Seven-Week Courses:
- If withdrawal is filed by the end of the first week of the course, tuition reversal amount is 100%.
- If withdrawal is filed by the end of the second week of the course, tuition reversal amount is 50%.
- If withdrawal is filed by the third week of the course and later, no reversal of tuition charges.

Students who withdraw from Wentworth and receive Federal Student Financial Aid are subject to a refund policy as prescribed by Federal Regulations. Students should contact the Student Service Center to obtain the appropriate financial aid refund schedule as well as to discuss any remaining financial obligations with a Student Financial Services or Financial Aid counselor.

Fees are not refundable. Students are liable for tuition and fees in accordance with the published refund policy.

Room and Board Adjustment
A student's room and board charges are determined by the date which the student's room key(s) is returned to the Resident Hall director. A student who withdraws within the first four weeks of the semester is responsible for board charges based on actual meal points used. From week five through the end of the semester, the student will be responsible for the entirety of the board plan charged. To receive a pro-rated room charge refund, a student must withdraw in writing and check out with a Resident Hall director within the first four weeks of the current semester. After the fourth week of classes, no adjustment will be made to a student's room charge if he or she decides to withdraw from Wentworth or leave the residence halls.

No adjustments to room or board charges will be made to the account of any student who is withdrawn for discipline sanctions. For more information, please contact the Office of Housing and Residential Life at housing@wit.edu or (617) 989-4160.

Housing Agreement Release
Students living on campus for the fall and spring semesters sign a two-semester Housing Agreement. Students who withdraw from housing without a valid reason will be charged a Housing Agreement Release Fee of $1,000 if they withdraw from the residence halls after the fourth week of the fall semester or through the fourth week of the spring semester. Students withdrawing from the residence halls after this point are responsible for the full spring room charge. For more information please refer to the website (http://wit.edu/reslife) or contact the Office of Housing and Residence Life at (617) 989-4160.

Refund of Payments
After all necessary adjustments have been made to a student's account, any credits resulting from payments made will be refunded in accordance with the manner in which they were received.

Federal Funds Refund
If a student withdraws from Wentworth during the semester, the total refunded amount is determined according to federal and institutional
refund policy. The refund will be returned to the individual programs in the following order:

1. Federal Unsubsidized Stafford Loan,
2. Federal Subsidized Stafford Loan,
3. Federal Perkins Loan,
4. Federal PLUS Loan,
5. Federal Pell Grant,
6. Federal Supplemental Educational Opportunity Grant,
7. State funded Grants,
8. Private funded programs, and

Specific questions regarding the refund policy can be addressed with a student's Financial Aid counselor in the Student Service Center.

In some cases, a student's account may end up having a balance due after the federal financial aid adjustment is done. Students will be notified and billed for the balance and any account balance becomes due immediately.

## Study Abroad Opportunities

Wentworth seeks to strengthen our students’ educational experience by offering an opportunity for global learning. Wentworth study abroad programs are designed to immerse students in foreign cultures through classroom instruction and field experiences and to gain a comprehensive education marked by high standards and quality.

Wentworth has established partnerships around the world with a select group of affiliated programs that have demonstrated a proven track record for academic integrity and earned a reputation for excellence in providing solid support throughout their study abroad programs. Wentworth also offers faculty-led study abroad programs which provide a unique opportunity to gain a credit bearing international experience under the instruction of members of the WIT faculty. For a full list of study abroad options visit the study abroad website (http://wit.edu/study-abroad).

Several Wentworth departments have developed study abroad programs such as student exchange programs and faculty-led programs with other institutions. In past years, students have studied in Germany, France, England, Istanbul, Switzerland, China, Australia, and many other countries through these programs. Please refer to the study abroad website (https://wit.edu/study-abroad) for more information.

Wentworth students can also take advantage of the Global Education Opportunities (GEO) Center at the Colleges of the Fenway for assistance in finding abroad opportunities. Please see cof.studioabroad.com for more information. All travel by Wentworth staff, faculty, or students for Wentworth-related or -sponsored activities must be registered through the GEO Center COF database.

All courses taken during a study abroad semester require preapproval and are submitted to the Office of the Registrar on a completed International Transfer Credit Pre-approval form (http://www.wit.edu/ssc/forms). Students must meet with their department chair to determine if the available courses will satisfy requirements within their major. In many cases an established course equivalency list is available. In instances where an equivalency has not been established, prior approval of the department chair is required.

Courses completed that have not been pre-approved will not become part of the student’s WIT academic record unless approved by the department chair. Approval is not guaranteed. All accepted international credits will be held to the same minimum grade requirements as at Wentworth Institute of Technology. Approved courses will appear on a student’s official transcript with grades of "TR" (transfer credit) and are not calculated into a student GPA.

## Visiting/Exchange Students

Students pursuing degrees abroad at institutions with a signed articulation agreement with Wentworth Institute of Technology may apply to enroll at Wentworth for one or two semesters as a non-matriculating/exchange student with the approval of their home institution.

Visiting/exchange students are required to purchase health insurance through Wentworth. Applications for enrollment will be reviewed for academic eligibility by the appropriate academic department and by the Office of the Provost for eligibility for non-immigrant student status.

Visiting/exchange students are regarded as members of the Wentworth community and as such are encouraged to participate in campus life through engagement in student club activities, etc. Visiting/exchange students are also responsible for adhering to the Student Code of Conduct as well as any other rules set forth by the University.
COLLEGE OF ARCHITECTURE, DESIGN AND CONSTRUCTION MANAGEMENT

Charles Hotchkiss, Dean
Annex North Room 105
(617) 989-4831

Vision
To position our college and prepare our students for leadership in design and the built environment professions.

Mission
In the College of Architecture, Design and Construction Management, students learn to design, construct, adapt, and manage the built environment in ways that reflect the highest standards of technological innovation, craftsmanship, and sustainability. Students acquire skills, knowledge, and habits of thought and practice that allow them to create lives of meaning and purpose as engaged citizens and productive and creative professionals.

Architecture Department

Mission
Wentworth Architecture transforms students with diverse backgrounds into innovative design thinkers and leaders in the field of architecture. They develop creative confidence, technical knowledge, professional skills, and expanded perspectives through integrated and applied learning experiences, including international travel studies and co-op employment. The studio-based program centers on making as a form of thinking. Students engage locally and globally, explore advanced technologies, team within and across disciplines, and learn to design sustainably. Wentworth Architecture students graduate with passion and insight, ready to contribute to society through the built environment.

Department Chair
• Mark Mulligan, M.Arch.

Professor
• Ann Borst, M.Arch.
• Robert Cowherd, Ph.D.
• Manuel E. Delgado, M.S.
• John S. Ellis, M. Des.
• Garrick N. Goldenberg, M.S.C.E.
• Mark A. Klopf, MLA
• Mark E. Pasnik, M. Des.

Associate Professor
• Carol Burns, M.Arch.
• Antonio Furgiuele, M.S.
• Lora Kim, M.Arch.
• Jennifer Lee Michaliszyn, M.Arch.
• Troy Peters, M.Arch.
• Ann W. Pitt, M.Arch.

• Anne-Catrin Schultz, Ph.D.
• Robert Trumbour, M.Arch.

Assistant Professor
• Meliti Dikeos, M.Arch.
• Ingrid Strong, M.Arch.

Director of Graduate Program
• Kelly Hutzell, MSAUD

Architecture Bachelor of Science
Leading to the Bachelor of Science Degree in Architecture

The Bachelor of Science in Architecture (B.S.Arch) program is a rigorous course of study centered on the design studio, where students work closely with faculty in their explorations of design and design methods. Associated courses in history, theory, technology, and professional practice often inform design studio problems. Student learning is enhanced by two semesters of cooperative work experience as well as study abroad options.

All entering freshmen are admitted to the four-year B.S.Arch program. During the junior year students focus their educational interests by choosing one of the three concentrations outlined below.

Program Educational Objectives
The course of studies provides a pre-professional degree including a liberal arts curriculum in which students are challenged to view their education holistically, through required and elective courses both outside and within the architectural curriculum. Advanced studies serve to develop and focus the skills and powers of inquiry required for seeing architecture within its larger global cultural context; they also offer a forum where students develop abilities in advanced problem solving, independent research, and writing within the architectural and humanities curricula. The program encourages deep explorations in the material culture of architecture and challenges students to deploy this knowledge in ways that enrich the built environment and enhance people’s lives. Along with providing a pre-professional degree in architecture, successful completion of the program allows students at Wentworth to apply to the one-year Master of Architecture program.

Professional Licensure and Accreditation
In the United States, most registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), the sole agency authorized to accredit professional degree programs in architecture offered by institutions with U.S. regional accreditation, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. Doctor of Architecture and Master of Architecture degree programs may require a pre-professional undergraduate degree in architecture for admission. However, the pre-professional degree is not, by itself, recognized as a professional NAAB-accredited degree. NAAB may grant a two-year, three-year, or eight-year term of accreditation to a program, depending on the extent of its conformance with established educational standards. In 2018, NAAB granted Wentworth Architecture the eight-year term of accreditation.
Admission to the M.Arch Program from the Wentworth B.S.Arch Program

B.S.Arch students can apply to the M.Arch program in their senior year; acceptance is based on a portfolio evaluation by department faculty, departmental GPA (architecture courses), overall GPA, transcript, a statement of objectives, and references. Undergraduate students with a minimum departmental GPA of 3.2 (non-elective ARCH courses from first through third years only) will be accepted automatically into the M.Arch program for the following year. These students only need submit an application. Automatic acceptance applies only to applicants currently enrolled in Wentworth’s B.S.Arch program.

Student Outcomes

The B.S.Arch program emphasizes the tangible, material, and cultural dimensions of the discipline, while also accentuating the technologies that inform design. Graduates of the B.S.Arch program will have the ability to:

- Articulate design concepts in written, verbal and graphic forms, using appropriate media for communicating their ideas
- Develop abstract ideas and concepts through critical, rational and intuitive thinking in order to resolve complex design problems using research, making, and experimentation
- Describe both parallel and divergent histories of architecture and urban spaces as well as identify the social and spatial patterns that characterize different cultures and individuals
- Translate codes, develop a program of functional uses, respond to and design sites, integrate appropriate facilities and systems, and apply principles of life-safety as well as accessibility standards
- Employ knowledge of basic structural systems and apply appropriate structural systems to design solutions
- Select and apply environmental systems (both active and passive) and other building systems appropriate for a site and a program, considering environmental impact and sustainability
- Make integrated design decisions, relying on critical assessment and evaluation, in order to synthesize environmental, technical, accessibility, structural and material issues
- Interpret the nature and importance of professional practice by evaluating plans, schedules, specifications, and financial data

B.S. Arch Program Concentrations

The undergraduate program in architecture offers three areas of concentration, which allow students to pursue a particular focus within their study of architecture. The core architectural education is equivalent across concentrations, and all achieve the same learning outcomes. All students are required to select a concentration at the end of their first semester in junior year.

Adaptive Interventions

This concentration investigates architecture as a discipline in which the primary focus is on interventions into contingent existing conditions. Adaptive re-use, regenerative urbanism, sustainability, critical regionalism and related strategies are addressed at scales ranging from the individual building to the urban environment.

Emerging Technologies

This concentration explores the material nature of architecture, the craft of building, and the role of emerging technologies as they inform the design process. It emphasizes the broad architectural and cultural implications of technology, and advances an ethos of research through making.

Urbanism

This concentration focuses on the influence of the arts and humanities, ecology and landscape, economics and politics, and society on design at the urban scale. It challenges students to explore the representation of complex social, cultural and ecological systems as a form of research and offers students the skills and insights necessary to collaborate across disciplinary boundaries and to provide leadership in reshaping our cities.

Cooperative Work Experience

The Architecture Department has a substantial and well-established cooperative education component embedded in the curriculum. B.S.Arch students spend two semesters working in an architectural or allied professional office. The department collaborates with the Institute’s Center for Cooperative Education and Career Services to reinforce the learning content of these placements. Work experience, required for professional licensure, may be applied through ARCH2222 AXP ARCHITECTURE EXPERIENCE PROGRAM. Prior to their first cooperative education experience, students take ARCH2225 PRO-PRACTICE PREP which introduces them to basic concepts and terminology as well as the industry-standard software related to construction drawings.

Study Abroad Programs

The Department of Architecture offers semester-long study abroad options in Berlin, Germany, for students in the B.S.Arch program. This program is led by resident architects/Wentworth faculty members. During their time abroad, students work closely with local design and planning professionals. Intensive travel–oriented coursework gives students an additional cultural perspective. The curriculum is fully aligned with required courses in Boston, allowing normal progress toward graduation.

Degree Details

Total Credits for degree: 135

This is a four-year program that begins in the fall of the student’s first year and is planned to end in the spring semester of the fourth year.

In the junior year, students select one of three concentrations – Adaptive Interventions, Emerging Technologies, or Urbanism – which is the focus of selected courses through their senior year.

Special Grade Requirement

The Architecture Department has a special grade requirement that applies to all design studio courses from the sophomore year onward. Students in the B.S.Arch program must comply with the following design studio grade requirement:

Final grade must be C or better if the final grade in the previous design studio is less than a C.

Students who receive a final grade below C for two consecutive semesters are not permitted to continue in the program until they successfully repeat the second studio for which they received a sub-standard grade.
Curricular Sequence

Foundation and Integration

In the first three semesters, students get a broad introduction to the field of architecture, which serves as the foundation for the curriculum. In the following three semesters, students gain knowledge in integrative design.

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credits</th>
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<tr>
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**ENGL/HSS Note**

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences

- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

**Concentration**

In the junior year, students choose one of three concentrations. In the spring of third year, students will take their first concentration seminar, designed to introduce them to the history and theory of their chosen concentration. This seminar will be followed in the fourth year with another concentration seminar as well as a concentration-specific studio.

**Urbanism Concentration**

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**Emerging Technologies Concentration**

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## Course Title Credits

### Senior Year

#### Fall Semester

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### Spring Semester

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### Adaptive Interventions Concentration

#### Course Title Credits

### Junior Year

#### Spring Semester

<table>
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<tr>
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<td>ARCH3900</td>
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### Senior Year

#### Fall Semester

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## Architecture Electives

Students are encouraged to pursue breadth, as well as depth in their architectural studies. The following list is indicative of the department's elective course offerings in recent years:

### Course Title Credits

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ARCH3800</td>
<td>SPECIAL TOPICS IN ARCHITECTURE (Advanced Hand Drawing for Architecture)</td>
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<tr>
<td>ARCH3800</td>
<td>SPECIAL TOPICS IN ARCHITECTURE (Architecture in the Information Age)</td>
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Architecture Masters Degree

Leading to a Master of Architecture Degree

Program Educational Objectives

Wentworth’s NAAB-accredited Master of Architecture program is highly experiential and hands-on, introducing students to the contemporary challenges of the built environment and giving them the skills needed to be a leader in a rapidly evolving profession.

Architectural Accreditation

The Department currently holds a full 8-year term of accreditation (the maximum possible under the 2009 NAAB Conditions for Accreditation) for its Master of Architecture degree program from the National Architectural Accrediting Board (NAAB). In order to promote transparency in the process of accreditation in architectural education, Wentworth is required by NAAB to make the following information available to the public.

Statement on NAAB-Accredited Degrees

In the United States, most registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), the sole agency authorized to accredit professional degree programs in architecture offered by institutions with U.S. regional accreditation, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. Doctor of Architecture and Master of Architecture degree programs may require a pre-professional undergraduate degree in architecture for admission. However, the pre-professional degree is not, by itself, recognized as a professional NAAB-accredited degree. NAAB may grant a two-year, three-year, or eight-year term of accreditation to a program, depending on the extent of its conformance with established educational standards.

Wentworth Institute of Technology’s Department of Architecture offers the following National Architectural Accreditation Board (NAAB) accredited degree program as a one-, two- or three-year sequence of study:

- 1 Yr M.Arch (Wentworth B.S. Arch + 36 credits)
- 2 Yr M.Arch (Pre-professional Degree + 70 credits)
- 3 Yr M.Arch (non-professional degree + 106 credits)

The next accreditation visit for all programs is spring 2026.

Admission to the M.Arch Program

The department offers three NAAB-accredited professional Master of Architecture degree tracks:

- The one-year, Master of Architecture professional degree for students who earned their B.S. degree in architecture from Wentworth: Internal Candidates. External candidates who have successfully completed a B.Arch degree from another institution are also eligible for the one-year track.
- The two-year, Master of Architecture professional degree for external candidates who have successfully completed a pre-professional degree in Architecture from a NAAB-accredited program: External Candidates
- The three-year, Master of Architecture professional degree for external candidates who have a four-year Bachelor of Arts or Bachelor of Science in an unrelated discipline: External Candidates

Student Outcomes

The M.Arch program emphasizes the tangible, material, and cultural dimensions of the discipline, while also accentuating the technologies that inform design. Graduates of the M.Arch program will have the ability to:

- Critically evaluate complex professional problems and ethical issues in the realm of architecture and reconcile diverse stakeholder needs.
- Evaluate and synthesize design methods applied in a critical iterative process towards the successful resolution of a specific set of challenges relevant to contemporary practice.
- Demonstrate a familiarity with parallel and divergent histories and the cultural norms of a variety of human and natural environments in terms of their cultural, political, economic, social, ecological and technological factors. Graduates will develop sophisticated, appropriate, and workable proposals to ensure equity of access to sites, buildings and structures through meaningful interaction with other cultures in a global context.
- Apply knowledge of comprehensive practice-based design, employing advanced skills in architectural making and building.

Travel Studios

The Department of Architecture offers a ten-day trip for students in the fall semester of the culminating year of the M.Arch program as part of the M.Arch Travel Studios. Recent studios have traveled to Bali, Barcelona, Benin, London, New England, Rome, Paris, and Shanghai. During their time abroad, students engage with community members, stakeholders, and/or students from other universities. Intensive travel–oriented coursework gives students an additional cultural perspective. Together,
students and faculty advance architectural research, investigating a particular method, a site, or an architectural question.

**Thesis Program**

The eight-month thesis program begins in the fall semester of the culminating year with two foundational courses. The two fall Thesis Preparation 01 & 02 courses operate symbiotically, generating ideas and research methods to ground individual thesis work and project execution. Both courses serve as a springboard for critical thinking, writing, and making in preparation for the spring semester Thesis Studio, and a now-defined design research project of the students’ own conception. Primary and independent advisors shape the curriculum and define milestones in their quest to teach students to be critical thinkers for the future of the profession.

Total credits for degree: 36 (one-year), 70 (two-year), or 106 (three-year)

This program begins in the fall of the student’s first year and ends in the spring semester of the first, second, or third year.

Students in the M.Arch program must maintain a 3.0 GPA to be in good academic standing.

**Master of Architecture (One-Year)**

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<td>ARCH9500</td>
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<td>ARCH9600</td>
<td>PROFESSIONAL PERSPECTIVES</td>
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**Master of Architecture (Two-Year)**

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<td>FABRICATION METHODS</td>
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**Master of Architecture (Three-Year)**

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<td>ARCH7000</td>
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<td>GRADUATE HISTORY THEORY LECTURE</td>
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<tr>
<td>ARCH8500</td>
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Architectural Studies Minor

The Department of Architecture offers a minor in Architectural Studies open to students enrolled in all other departments at Wentworth. The course sequence includes two classes in architectural history and three focused on technology. The history courses introduce students to the masterpieces of architecture across several millennia through lectures and assignments that concentrate on analytical sketching and critical writing. In the technology courses, students focus on site design concepts and environmental building strategies, studying methods for achieving visual, thermal, and acoustical comfort in buildings using climate, form, orientation, materials, and structure. The minor in Architectural Studies exposes students to the fundamentals and complexities of the built environment, an area of expertise relevant for many professions and careers.

To earn the minor, the student must complete the following five courses in this order:

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<td>ARCH2100</td>
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<td>ARCH2600</td>
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<td>ARCH3200</td>
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to become innovative technical problem-solvers and industry leaders. The philosophy of the program is to offer a curriculum that challenges, shapes, and encourages students to think about and apply their expanding technical knowledge and organizational skills to the solution of contemporary problems. This philosophy is supported by the educational mission of the Institute that emphasizes physics and mathematics (both theoretical and applied), humanities and social sciences, communication skills, and computer science. Students are prepared through their educational experience to adapt to changes in society, technology, and the profession.

There are several goals of the Construction Management program:

- Maintain accreditation by the American Council of Construction Education (ACCE), which promotes, supports, and accredits construction education programs.
- Successfully place students in positions appropriate for college graduates in the construction industry.
- Maintain class sizes of no more than 30 students in each lecture and no more than 20 students in each lab.
- Provide Students with the knowledge and skills to succeed in supervisory and management roles in construction related fields.

The following are the learning outcomes that will be used to assess the Construction Management program.

- Create oral presentations appropriate to the construction discipline.
- Create written communications appropriate to the construction discipline.
- Create a construction project safety plan.
- Create construction project estimates.
- Create construction project schedules.
- Analyze professional decisions based upon ethical principles.
- Analyze construction documents for planning and management of construction processes.
- Analyze methods, materials, and equipment used on construction projects.
- Apply construction management skills as an effective member of a multi-disciplinary team.
- Apply electronic-based technology to manage the construction process.
- Apply basic surveying techniques for construction layout and control.
- Analyze different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
- Understand construction risk management.
- Understand construction accounting and cost control.
- Understand construction quality assurance and control.
- Understand construction project control processes.
- Understand the legal implications of contract, common, and regulatory law to manage a construction project.
- Understand the basic principles of sustainable construction.
- Understand the basic principles of structural behavior.
- Understand the basic principles of mechanical, electrical, and piping systems.

Department Chair
- E. Scott Sumner, M.S.
Professor
• Cristina Cosma, Ph.D.
• Mark H. Hasso, Ph.D.

Associate Professor
• Payam Bakhshi, Ph.D.
• M. Ilyas Bhatti, M.S.
• Monica A. Snow, Ph.D.
• E. Scott Sumner, M.S.
• Thomas A. Taddeo, M.S.

Assistant Professor
• Richard Christiano, M.Ed.
• John Cribbs, Ph.D.
• William Kearney, M.S.
• Afshin Pourmokhtarian, Ph.D.

Construction Management Bachelor of Science
Leading to the Bachelor of Science Degree in Construction Management
The Construction Management program provides a background of technical skills to apply to a construction project from conception to completion. Students are taught the skills necessary to manage resources, time, cost, and quality with an emphasis on team building. Skills developed during the program include management, budgeting and cost control, cost estimating, scheduling, engineering fundamentals, and the development of analytical and communication skills. The Construction Management program has a cooperative education program where hands-on experience is acquired. Career opportunities for the construction manager are found throughout the industry and include positions with construction companies, government agencies, architectural and engineering firms, industrial firms, and manufacturing and materials suppliers.

Program Educational Objectives
There are several goals of the Construction Management program:
• Maintain accreditation by the American Council of Construction Education (ACCE), which promotes, supports, and accredits construction education programs.
• Successfully place students in positions appropriate for college graduates in the construction industry.
• Maintain class sizes of no more than 30 students in each lecture and no more than 20 students in each lab.
• Provide Students with the knowledge and skills to succeed in supervisory and management roles in construction related fields.

Student Outcomes
The following are the learning outcomes that will be used to assess the Construction Management program.
• Create oral presentations appropriate to the construction discipline.
• Create written communications appropriate to the construction discipline.
• Create a construction project safety plan.
• Create construction project estimates.
• Create construction project schedules.
• Analyze professional decisions based upon ethical principles.
• Analyze construction documents for planning and management of construction processes.
• Analyze methods, materials, and equipment used on construction projects.
• Apply construction management skills as an effective member of a multi-disciplinary team.
• Apply electronic-based technology to manage the construction process.
• Apply basic surveying techniques for construction layout and control.
• Analyze different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
• Understand construction risk management.
• Understand construction accounting and cost control.
• Understand construction quality assurance and control.
• Understand construction project control processes.
• Understand the legal implications of contract, common, and regulatory law to manage a construction project.
• Understand the basic principles of sustainable construction.
• Understand the basic principles of structural behavior.
• Understand the basic principles of mechanical, electrical, and piping systems.

Credits for Degree: 134
This is a four-year, American Council for Construction Education (ACCE) accredited program that begins in the fall of the student’s first year and is planned to finish in the summer semester of the student’s fourth year.

This period includes two semesters of cooperative work experience. A graduate of the program can earn a Construction Manager in Training (CMIT) certificate, the first step in gaining a Certified Construction Manager (CCM) professional registration.

Students should contact their academic advisor or academic department office for information regarding the construction management elective.

Special Graduation Requirement
Students in the Bachelor of Science in Construction Management program must demonstrate completion of a U.S. Department of Labor Occupational Safety and Health Administration (OSHA) 30-hour training course in Construction Safety & Health. Submission to the Registrar of a photocopy of either the signed and dated card or verification and dating of entrance ticket or receipt indicating that the student actually attended the training will serve as adequate proof.

Construction Management (BSCM)

<table>
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<th>Credits</th>
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<td>CONM1000</td>
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<td>CONM1200</td>
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<td>MATH1000</td>
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<td>CONM2500</td>
<td>BUILDING SYSTEMS</td>
<td>4</td>
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<tr>
<td>CONM2600</td>
<td>WOOD &amp; STEEL ANALYSIS &amp; DESIGN</td>
<td>3</td>
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<tr>
<td>MATH1030</td>
<td>STATISTICS &amp; APPLICATIONS</td>
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<td><strong>Credits</strong></td>
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<tr>
<td>CONM3000</td>
<td>MATERIALS TESTING &amp; QUALITY CONTROLS</td>
<td>4</td>
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<tr>
<td>CONM3100</td>
<td>CONSTRUCTION PROJECT MANAGEMENT</td>
<td>4</td>
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<tr>
<td>CONM3201</td>
<td>CONSTRUCTION PROJECT SCHEDULING</td>
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<td>MGMT3000</td>
<td>MANAGING &amp; LEADING ORGANIZATIONS</td>
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<td>COOP3500</td>
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<td><strong>Credits</strong></td>
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<tr>
<td>CONM3500</td>
<td>ADVANCED ESTIMATING &amp; BID ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>CONM3600</td>
<td>CONCRETE ANALYSIS &amp; DESIGN</td>
<td>4</td>
</tr>
<tr>
<td>CONM3800</td>
<td>SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT</td>
<td>3</td>
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<tr>
<td>HSS Elective</td>
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<tr>
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<td></td>
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<td>COOP4500</td>
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<td></td>
<td><strong>Credits</strong></td>
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</tr>
</tbody>
</table>

### ENGL/HSS Note

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the five humanities and social science electives, BSCM students must include the following **HSS Directed Electives**:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON4102</td>
<td>PRINCIPLES OF ECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>PSYC4552</td>
<td>INDUSTRIAL ORGANIZATION PSYCHOLOGY</td>
<td>4</td>
</tr>
</tbody>
</table>

### Construction Management Bachelor of Science - Commercial Real Estate Concentration

**Leading to a Bachelor of Science Degree in Construction Management with a Concentration in Commercial Real Estate**

The concentration in Commercial Real Estate is a specialized track within the Construction Management program. Commercial real estate is the real property used by a company for its own operational purposes. It provides corporations with a productive environment to house employees, manufacture and distribute products, and provide services to the market. Commercial real estate touches all classes
of property, land and buildings such as office facilities, data centers, manufacturing facilities, logistic centers, corporate headquarters, distribution facilities, retail stores, and hotels. Requires excellent communication skills, analytical approach to problem solving and attention to detail.

Building on a practical core of oral and written communications, mathematics, science, and business principles, the Commercial Real Estate concentration introduces students to a wide range of real estate and management issues including construction, leasing, property evaluation, real estate financial analysis and real estate principles. An integral aspect of the concentration is the experience students gain through two semesters of cooperative employment in corporate real estate offices.

**Program Educational Objectives**

There are several goals of the Construction Management program:

- Maintain accreditation by the American Council of Construction Education (ACCE), which promotes, supports, and accredits construction education programs.
- Successfully place students in positions appropriate for college graduates in the construction industry.
- Maintain class sizes of no more than 30 students in each lecture and no more than 20 students in each lab.
- Provide Students with the knowledge and skills to succeed in supervisory and management roles in construction related fields.

**Student Outcomes**

The following are the learning outcomes that will be used to assess the Construction Management program.

- Create oral presentations appropriate to the construction discipline.
- Create written communications appropriate to the construction discipline.
- Create a construction project safety plan.
- Create construction project estimates.
- Create construction project schedules.
- Analyze professional decisions based upon ethical principles.
- Analyze construction documents for planning and management of construction processes.
- Apply construction management skills as an effective member of a multi-disciplinary team.
- Apply electronic-based technology to manage the construction process.
- Apply basic surveying techniques for construction layout and control.
- Analyze different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
- Understand construction risk management.
- Understand construction accounting and cost control.
- Understand construction quality assurance and control.
- Understand construction project control processes.
- Understand the legal implications of contract, common, and regulatory law to manage a construction project.
- Understand the basic principles of sustainable construction.

- Understand the basic principles of structural behavior.
- Understand the basic principles of mechanical, electrical, and piping systems.

Credits for Degree: 133

This is a four-year program that begins in the fall of the student's first year and is planned to finish in the summer semester of the student's fourth year. Students in this track will be accepted into the Construction Management program. Prior to their sophomore year, students can formally elect to enter the Commercial Real Estate concentration.

**Construction Management (BSCM) with Concentration in Commercial Real Estate**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman Year</td>
<td>Fall Semester</td>
</tr>
<tr>
<td>CONM1000</td>
<td>INTRODUCTION TO CONSTRUCTION MANAGEMENT, FACILITIES MANAGEMENT &amp; REAL ESTATE DEVELOPMENT</td>
</tr>
<tr>
<td>CONM1200</td>
<td>BUILDING CONSTRUCTION</td>
</tr>
<tr>
<td>CHEM1000</td>
<td>CHEMISTRY OF THE BUILT ENVIRONMENT</td>
</tr>
<tr>
<td>MATH1000</td>
<td>COLLEGE MATHEMATICS</td>
</tr>
<tr>
<td>English Sequence</td>
<td></td>
</tr>
<tr>
<td>Spring Semester</td>
<td></td>
</tr>
<tr>
<td>CMRE1500</td>
<td>PRINCIPLES OF COMMERCIAL REAL ESTATE</td>
</tr>
<tr>
<td>CONM1500</td>
<td>CONSTRUCTION GRAPHICS</td>
</tr>
<tr>
<td>MATH1500</td>
<td>PRECALCULUS</td>
</tr>
<tr>
<td>PHYS1000</td>
<td>COLLEGE PHYSICS I</td>
</tr>
<tr>
<td>English Sequence</td>
<td></td>
</tr>
<tr>
<td>Sophomore Year</td>
<td>Fall Semester</td>
</tr>
<tr>
<td>CMRE2000</td>
<td>REAL ESTATE INVESTMENT</td>
</tr>
<tr>
<td>CONM2100</td>
<td>STATICS &amp; STRENGTH MATERIALS</td>
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<tr>
<td>CONM2200</td>
<td>ESTIMATING</td>
</tr>
<tr>
<td>MGMT2700</td>
<td>FINANCIAL ACCOUNTING</td>
</tr>
<tr>
<td>ECON4102</td>
<td>PRINCIPLES OF ECONOMICS</td>
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<tr>
<td>Credits</td>
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<tr>
<td>Spring Semester</td>
<td></td>
</tr>
<tr>
<td>CONM2500</td>
<td>BUILDING SYSTEMS</td>
</tr>
<tr>
<td>CMFM2400</td>
<td>PROPERTY MANAGEMENT</td>
</tr>
<tr>
<td>MATH1030</td>
<td>STATISTICS &amp; APPLICATIONS</td>
</tr>
<tr>
<td>HSS Elective</td>
<td></td>
</tr>
<tr>
<td>Summer Semester</td>
<td></td>
</tr>
<tr>
<td>COOP3000</td>
<td>PRE CO-OP WORK TERM</td>
</tr>
<tr>
<td>Junior Year</td>
<td></td>
</tr>
<tr>
<td>CMRE3000</td>
<td>REAL PROPERTY ANALYSIS</td>
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<tr>
<td>CONM3100</td>
<td>CONSTRUCTION PROJECT MANAGEMENT</td>
</tr>
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</table>
Of the five humanities and social science electives, BSCM students must include the following HSS Directed Electives:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ECON4102</td>
<td>PRINCIPLES OF ECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>PSYC4552</td>
<td>INDUSTRIAL ORGANIZATION PSYCHOLOGY</td>
<td>4</td>
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</tbody>
</table>

### Construction Management Bachelor of Science - Facilities Management Concentration

#### Leading to a Bachelor of Science Degree in Construction Management with a Concentration in Facilities Management

The concentration in Facilities Management is a specialized track within the Construction Management program. It aims to develop in its students recognized management skills along with the knowledge concerning current technologies that is necessary for entry-level professional practice. Facilities Management practice can be regarded as the management of a company's or institution's physical assets. The management of these assets involves short-term and long-term planning for physical facilities and real properties that integrates the organization's strategic business plan and the technical components for that plant. The quality of work life and cost effectiveness of the organization's environment are the goals of the facilities manager.

Building on a practical core of oral and written communications, mathematics, science, and business principles, the Facilities Management concentration introduces students to a wide range of facilities and management issues including construction, energy management techniques, building management, facility assessment, and real estate principles. An integral aspect of the concentration is the experience students gain through two semesters of cooperative employment in facilities management offices.

#### Program Educational Objectives

There are several goals of the Construction Management program:

- Maintain accreditation by the American Council of Construction Education (ACCE), which promotes, supports, and accredits construction education programs.
- Successfully place students in positions appropriate for college graduates in the construction industry.
- Maintain class sizes of no more than 30 students in each lecture and no more than 20 students in each lab.
- Provide Students with the knowledge and skills to succeed in supervisory and management roles in construction related fields.

#### Student Outcomes

The following are the learning outcomes that will be used to assess the Construction Management program:

- Create oral presentations appropriate to the construction discipline.
- Create written communications appropriate to the construction discipline.
- Create a construction project safety plan.
- Create construction project estimates.
• Create construction project schedules.
• Analyze professional decisions based upon ethical principles.
• Analyze construction documents for planning and management of construction processes.
• Analyze methods, materials, and equipment used on construction projects.
• Apply construction management skills as an effective member of a multi-disciplinary team.
• Apply electronic-based technology to manage the construction process.
• Apply basic surveying techniques for construction layout and control.
• Analyze different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
• Understand construction risk management.
• Understand construction accounting and cost control.
• Understand construction quality assurance and control.
• Understand construction project control processes.
• Understand the legal implications of contract, common, and regulatory law to manage a construction project.
• Understand the basic principles of sustainable construction.
• Understand the basic principles of structural behavior.
• Understand the basic principles of mechanical, electrical, and piping systems.

Credits for Degree: 134

This is a four-year program that begins in the fall of the student’s first year and is planned to finish in the summer semester of the student’s fourth year. Students in this track will be accepted into the Construction Management program. Prior to their sophomore year, students can formally elect to enter the Facilities Management concentration. Upon graduating, students in the Facilities Management concentration will have the opportunity to continue in the Wentworth Master of Science in Facilities Management program.

Construction Management (BSCM) with Concentration in Facilities Management

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>Freshman Year</td>
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<tr>
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<tr>
<td>CONM1000</td>
<td>INTRODUCTION TO CONSTRUCTION MANAGEMENT, FACILITIES MANAGEMENT &amp; REAL ESTATE DEVELOPMENT</td>
<td>3</td>
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<tr>
<td>CONM1200</td>
<td>BUILDING CONSTRUCTION</td>
<td>4</td>
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<tr>
<td>CHEM1000</td>
<td>CHEMISTRY OF THE BUILT ENVIRONMENT</td>
<td>4</td>
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<td>MATH1000</td>
<td>COLLEGE MATHEMATICS</td>
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<tr>
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<tr>
<td>CMFM2400</td>
<td>PROPERTY MANAGEMENT</td>
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<td>CONM1500</td>
<td>CONSTRUCTION GRAPHICS</td>
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<td>MATH1500</td>
<td>PRECALCULUS</td>
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<td>PHYS1000</td>
<td>COLLEGE PHYSICS I</td>
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<tr>
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<td>Credits</td>
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<td>CONM4200</td>
<td>CONSTRUCTION SAFETY &amp; RISK MANAGEMENT</td>
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<td>MGMT3500</td>
<td>FINANCIAL MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MGMT4100</td>
<td>POWER &amp; LEADERSHIP IN ORGANIZATIONS</td>
<td>4</td>
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<tr>
<td>MGMT4400</td>
<td>BUSINESS NEGOTIATION PRINCIPLES</td>
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<td>HSS Elective</td>
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<td>4</td>
</tr>
<tr>
<td>Credits</td>
<td></td>
<td>18</td>
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</tbody>
</table>
The Master of Science in Construction Management (MSCM) program at Wentworth Institute of Technology is accredited by the American Council for Construction Education (ACCE). The primary goal of ACCE is to promote and improve construction education in colleges and universities. By working together through ACCE, representatives of the total construction community and the public at large, construction educators and constructors establish and maintain standards and criteria for accreditation; ACCE provides guidance to those programs seeking to achieve accredited status, and carry out the accreditation process.

ACCE accreditation serves the interests of:

- Students: by helping them identify institutions and programs that offer quality education in construction education,
- The Construction Industry: by enabling employers to identify persons who have the potential for making lasting contributions to the construction industry and their profession, and
- Owners / Users of Constructed Facilities and the Public at Large: by raising the professional caliber of constructors and thus the quality of the construction for which they assume responsibility.

Specifically, accreditation of a construction education program by ACCE assures:

- Students and prospective employers that the program has met stringent industry standards of content and quality,
- That program graduates have been provided a quality education enabling them to perform a broad range of professional responsibilities, and
- The construction industry and students that the program performs periodic self-evaluations to keep current with emerging technologies and requirements of the construction industry.

Accreditation by ACCE assists an institution and its construction education program in maintaining contact with other programs and practicing construction professionals, and enables the program to:

- Keep current with emerging technologies in the field,
- Increase awareness of current courses, facilities, and services provided by other accredited programs,
- Improve instructional techniques, and
- Access construction industry contacts nationwide.

Program Educational Objectives

To accomplish the mission of the Master of Science in Construction Management program, the following program goals have been developed in order to prepare students academically for personal and professional success in the built environment. The attainment of goals is evaluated through the program’s outcome assessment program.

- Present opportunities to develop meta-cognitive and life-long learning skills for students seeking increasingly complex management responsibilities, new leadership roles and overall career advancement,
- Expose students to subject matter and industry experts and the latest technological and managerial/leadership advancements and their effects on the Construction Industry, and
- Prepare and develop students from related disciplines to advance into the field of Construction Management.

### Construction Management Master of Science

**Leading to the Master of Science in Construction Management Degree**

The Master of Science in Construction Management (MSCM) program at Wentworth Institute of Technology is accredited by the American Council for Construction Education (ACCE) https://www.acce-hq.org/.

### Mission

The Master of Science in Construction Management (MSCM) program at Wentworth Institute of Technology College of Professional and Continuing Education (CPCE) is a graduate program of study for construction professionals. The program is designed to educate students in foundational post graduate management principles combined with relevant construction education and experience in topics that are specific to preparing and advancing professional skills in administrative and executive leadership positions in design firms, construction companies and related disciplines. Both thesis and non-thesis options are available which allow for a variety of employment or educational opportunities including but not limited to working for general contractors, real-estate developers, sub-contractors, construction management and architectural/engineering firms, as well as advanced education and teaching options.

### Course List

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CMFM5500</td>
<td>CAPSTONE PROJECT IN FACILITY MANAGEMENT</td>
<td>4</td>
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<tr>
<td>CONM4650</td>
<td>BUSINESS, CONSTRUCTION LAW &amp; GOVERNMENT REGULATIONS</td>
<td>3</td>
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<td>MGMT3600</td>
<td>LABOR RELATIONS</td>
<td>3</td>
</tr>
<tr>
<td>HSS Elective</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

#### ENGL/HSS Note

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the five humanities and social science electives, BSCM students must include the following HSS Directed Electives:

- ECON4102 PRINCIPLES OF ECONOMICS
- PSYC4552 INDUSTRIAL ORGANIZATION PSYCHOLOGY
Student Outcomes

The operation, academic integrity and improvement of the MSCM program is based on the relationship of MSCM Program Course and Learning Outcomes to the American Council for Construction Educators (ACCE) Required Program Learning Outcomes (PLO). MSCM Course and Student Learning Outcomes (SLO) are mapped to the ten (10) PLOs required by American Council for Construction Educators (ACCE).

1. Critical thinking and creativity - MSCM students analyze and integrate information to conduct critical, reasoned arguments.
2. Problem solving and decision making - MSCM students design, evaluate, and implement strategies using advanced construction management concepts and practices.
3. Effective and professional oral and written communications - MSCM students produce effective and professional communication in written and oral formats
4. Use of information and communication technology - MSCM students put into practice computer systems, productivity tools, software, and other information and communication technology.
5. Principles of leadership in business and management - MSCM students apply practical management decision-making tools and techniques and leadership best practices.
6. Current issues in construction - MSCM students demonstrate knowledge from industry experiences and keep up to date on developments, best practices, as well as tools and techniques in the field.
7. Complex project decision making and associated risk management - MSCM students recognize, weigh, and analyze risks associated with complex construction projects.
8. Professional ethics including application to situations and choices - MSCM students identify ethical dilemmas in construction and apply practical skills to ethical situations.
9. Advanced construction management practices - MSCM students demonstrate knowledge of contemporary construction industry methods and construction management principles and practices.
10. Research methods - MSCM students recognize and conduct valid, data-supported, and appropriate research in construction management.

This is a five-semester program that begins in the fall semester of the student's first year and is planned to end after the spring semester of their second year. An optional thesis may be taken in the following summer semester.

Construction Management Electives

During the MSCM program, students take one elective in the spring semester of the second year from offerings that may include: CONM7250 CONFLICT RESOLUTION & NEGOTIATION FOR CONSTRUCTION MANAGEMENT; CONM7050 RESEARCH METHODOLOGY FOR CONSTRUCTION MANAGEMENT; CONM7500 INTERNATIONAL CONSTRUCTION; a class from the MS in Facility Management program; or a class from the MS in Technology Management program.

MSCM Recommended Schedule

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CONM7000</td>
<td>EXECUTIVE MANAGEMENT FOR CONSTRUCTION MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>CONM7100</td>
<td>MODERN CONSTRUCTION DELIVERY METHODS</td>
<td>3</td>
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<table>
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<tr>
<td>CONM7400</td>
<td>ADVANCED PROJECT CONTROLS</td>
<td>3</td>
</tr>
<tr>
<td>MGMT7050</td>
<td>BUSINESS FINANCE &amp; INVESTMENT</td>
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<table>
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<tr>
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Thesis Option Only (6 credits of CONM8900 required)

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Electives - Select one course

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<td>CONM7250</td>
<td>CONFLICT RESOLUTION &amp; NEGOTIATION FOR CONSTRUCTION MANAGEMENT</td>
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<td>CONM7500</td>
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<tr>
<td>TMGT course from MS in Technology Management program</td>
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Total credits for degree: 30 (36 with optional thesis)
Facility Management Master of Science

Leading to a Master of Science in Facility Management Degree

The Master of Science in Facility Management (MSFM) program is designed to educate students in foundational post-graduate management principles and enhanced facility management skills and knowledge. Students will learn the leadership and business skills necessary to respond to the demand to keep their facilities highly efficient and functional. Coursework will also integrate elements of several related disciplines, including: project management, finance, real estate, humans and their working environment, space planning, building operations and maintenance, and quality assessment. Graduates of the MSFM program will be prepared for leadership roles in facility management and related industries.

Mission

A key feature of the program is the opportunity to build strong professional relationships. Our instructors are proven leaders in the field and many of them work full-time in facility management and closely related areas. Our students also work in facility management and related industries, which creates an ideal learning environment in which students learn from both their instructor and their peers. Many of the concepts learned in the classroom can be immediately applied on the job. Facility Management is the holistic management of real property and the infrastructure of an organization with the aim of improving the productivity of its core business. It is the practice of coordinating the physical workplace with the people and work of the organization; it integrates the principles of business administration, project management, architecture and the behavioral and engineering sciences.

Program Educational Objectives

The Master of Science in Facility Management (MSFM) program is designed to combine common general management techniques with current facility management practices and technologies. The curriculum will provide graduates with the tools and managerial decision-making processes related specifically to maintaining and managing the built environment. The MSFM program is designed for working professionals, as an on-campus format (as well as an online format) with convenient evening classes and a cohort format that allows students to complete the degree in less than two years while still being able to work full-time and fulfill their personal responsibilities.

Student Outcomes

Graduates of the Master of Science in Facility Management (MSFM) program will be able to:

- Describe and demonstrate the implementation of management principles relating specifically to maintaining and managing the built environment.
- Formulate effective communication strategies/processes for delivering concepts, financial information, and strategic and tactical information regarding real property, equipment and staffing to all levels of staff in a business organization.
- Demonstrate leadership skills by leading a team from conception through completion and closeout of an assigned project.
- Demonstrate teamwork skills by participating constructively as a team member on an assigned project.
- Develop a facilities technology strategy for a business or other organization that demonstrates knowledge of different technology platforms, workplace management systems and CAFM; and of the larger social, ethical, and legal issues related to information, telecommunications and other supporting technologies.
- Demonstrate knowledge of research tools appropriate for analyzing and developing solutions for facilities management problems.
- Describe what constitutes effective sustainable policy and use that knowledge to develop a corporate sustainable program.
- Create an energy policy for a business or organization that reflects knowledge of how buildings use energy, and of proven methods to reduce energy consumption.
- Formulate and complete a complex project that demonstrates mastery of both the technical and managerial aspects of strategic facility management.

This is a five-semester program, starting in the fall of the student’s first year and planned to end in the summer semester of the student’s second year. Students may choose to complete an optional thesis during a sixth semester; it is not required for graduation.

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Total Credits: 36

Total credits for degree: 30 (36 with optional thesis)
MSFM Recommended Schedule

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Total credits for degree: 30 (36 with optional thesis)

Construction Management Minor

The minor in construction management provides students with a greater knowledge of the discipline that complements their major courses.

To earn the minor, the student must complete the following five courses in the listed order:

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Industrial Design Department

Mission

The Department of Industrial Design (product design) prepares students to be thoughtful and creative problem-solvers. Through studio-focused, project-based learning, industrial design students develop skills in sketching, form development, CAD, traditional prototyping, rapid prototyping, and human factors. Our product design students apply their skills toward human-centered design by developing creative products and experiences to improve the world in which we live.

Department Chair

- Samuel Montague, M.F.A.
- Simon R. Williamson, M. Des.

Associate Professor

- Robert Meszaros, AIGA
- Jeffrey A. Michael, M.F.A.
- Samuel Montague, M.F.A.
- Nick Ortolino, M.F.A.

Assistant Professor

- Derek Cascio, M.B.A
- Carlos Villamil, M.S.

Industrial Design Bachelor of Science

Leading to a Bachelor of Science Degree in Industrial Design

Professional industrial designers (product designers) work at the intersection of art, business, and technology to provide innovative vision for companies, services, and individuals. Using research and experience as catalysts, designers translate our psychological, social desires and aspirations into improved products and systems for better enjoyment of our world.

As a graduate, you will have opportunities to create products for all levels of production. Areas of possibility include consumer electronics, education, toys, sports, medical equipment, footwear, housewares, furniture, and exhibit design. Many graduates begin their careers immediately, designing either as a consultant, or as an in-house designer for some of the nation's leading brands. As they continue to grow professionally, graduates often end up in leadership roles within their respective companies, making top-level decisions as a design director or creative manager.

Much of your educational experience will consist of experiential project-based studios, as well as courses in drawing, model making, manufacturing technologies (such as computer-aided design and rapid prototyping), user research, and design history. Classroom and studio experiences are complemented by two required cooperative work experiences. The co-op experience reinforces curricular goals and accelerates an understanding of professional practice. A one-semester study abroad program in Europe is offered in the junior year, which includes all courses to continue on track for graduation. Students apply
for study abroad in the fall of the junior year (the program accepts a limited number of students).

Wentworth’s Industrial Design program leads to a Bachelor of Science degree in Industrial Design. It is a four-year program, fully accredited by the National Association of Schools of Art and Design (NASAD). NASAD provides published guidelines for evaluating Art and Design programs throughout the country. The NASAD handbook describes the goal of Industrial Design education and the essential competencies students must achieve to be prepared for an entry level design position. The NASAD Handbook describes the following:

**Industrial Design**

Industrial designers create and develop concepts and specifications that optimize the function, value, and aesthetics of products, environments, systems, and services for the benefit of user, industry, and society. Industrial design involves combinations of the visual arts disciplines, sciences, and technology, and requires problem-solving and communication skills.

The professional undergraduate degree in a design specialization is structured to provide in-depth, formal education that will prepare students for entry into professional practice upon graduation. This is the case whether the degree rubric is Bachelor of Fine Arts with a design specialization or another appropriate title.

**Context**

The role of the designer is not only to achieve the goodness of fit between form and context, but also to determine how much of the surrounding context will be considered as a specific design problem is addressed and solved. Basic competence in both framing and solving design problems is essential for graduates. In all design specializations, this competence includes knowledge of and ability to address the following:

- **Usefulness.** The value of communication, objects, environments, or services to persons and society.
- **Usability.** The cognitive or physical ease, efficiency, and satisfaction of people as they learn and use communication, objects, products, environments, systems, or services.
- **Desirability.** The perceived emotional, social, or cultural benefits of communication, objects, products, environments, systems, or services.
- **Sustainability.** The consequences of design in interdependent systems, lifespan of designed objects, and use and disposal of resources.
- **Feasibility.** The technological ability to produce and/or disseminate and/or distribute communication, objects, environments, or services.
- **Viability.** The economic potential and consequences, for example, for return on investment, economic sustainability, and growth.

**Program Educational Objectives**

NASAD Essential Competencies, Experiences, and Opportunities for Industrial Design:

1. Ability to design products and systems including, but not limited to a foundational understanding of how products and systems are made; what makes them valuable; how they are developed, realized, and distributed; and how they are related to environmental and societal issues and responsible design.

2. Ability to use technologies and tools associated with multi-dimensional design representation, development, dissemination, and application.

3. Foundational knowledge of the history of industrial design including, but not limited to the influences of works and ideas on the evolution of design study and practice over time and across cultures.

4. Fundamental knowledge of user experience, human factors, applied ergonomics, contextual inquiry, user preference studies, and usability assessments.

**BIND Sophomore Review**

A portfolio is not required for admission into the Industrial Design Program (BIND). However, BIND students must maintain a minimum program GPA of 2.5 for all DSGN and INDS courses (49 credits) by the end of the sophomore year (spring semester) in order to advance into the junior year. Students who do not meet this requirement can either transfer to a different degree program or repeat selected courses from the BIND program sophomore year.

To assess student accomplishment during the freshman and sophomore year, each student will take part in a comprehensive exhibition of design projects (in DSGN and INDS courses) at the end of each spring semester. The intent of the exhibit is to gauge students’ success in their respective classes for student advising and program assessment.

Total credits for degree: 136

This is a four-year program, which begins in the fall semester of the student’s first year and is planned to end after the summer semester of the student’s fourth year.

The Industrial Design Department has a special grade requirement that applies to all design studio courses from the sophomore year on:

Final grade must be C or better if the final grade in the previous design studio is less than a C.

Students who receive a final grade below C for two consecutive semesters are not permitted to continue in the program until they successfully repeat the 2nd studio for which they received a sub-standard grade.

**Industrial Design (BIND)**

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<th>Course</th>
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<th>Credits</th>
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### English Sequence

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#### Fall Semester

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### Total Credits

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### ENGL/HSS Note

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the six humanities and social science electives, BIND students must include the following HSS Directed Electives:

- A Design History Elective
- An Art History Elective
- PSYC/SOCL Elective

### Interior Design Department

The Bachelor of Science in Interior Design program recalls and reinforces the mission of the Institute by preparing and graduating students with excellent, diverse skills qualifying them for the demands of professional life.

The program recognizes that academic preparation is the foundation of lifelong learning in a dynamic and evolving profession, and seeks to develop student fluency and competence in an array of basic skills and processes. The program graduates students with a broad overview of the profession by balancing a curriculum equally weighted in creativity—the art of design—and fundamental technical knowledge with an appreciation for the iterative design process required to realize their creative goals.

The program orientation and the structure of the curriculum rest on a tripartite base: Wentworth’s “Student Learning Goals,” accreditation standards, and the definition of the professional interior designer. These three standards recognize the specialized and diverse knowledge and skills required in practice, and afford graduates substantial preparation for professional certification (also licensure where applicable).

### STUDENT LEARNING OUTCOMES

Upon graduation from the interior design program students should be able to demonstrate:

- creativity and artistic vision
- fluency with a design process
- broad intellectual depth
• technical skills and the craft of making
• knowledge of the business of design
• the ability to work efficiently both independently and collaboratively in teams
• an understanding of professional fiduciary responsibilities to the general public including but not limited to ethical practice, regulatory requirements, and resource conservation and sustainability

Department Chair
• Seunghae Lee, Ph.D.

Associate Professor
• Robert Meszaros, AIGA
• Nick Ortolino, M.F.A.
• Lynette Panarelli, M.I.D.
• Sean Stewart, M.Arch.

Assistant Professor
• Jennifer Sarabia, M.Arch.

Interior Design Bachelor of Science
Leading to a Bachelor of Science Degree in Interior Design

This is a four-year program, starting in the fall semester of the student’s first year and planned to end in the summer semester of the student’s fourth year. Each graduate will complete eight academic semesters plus two semesters of full-time cooperative work experience. The first co-op work semester is scheduled in the junior year, and the second in the senior year. An optional co-op experience is offered in the summer between the sophomore and junior year. Select foundation courses in the first semester are shared with the Industrial Design program. A portfolio is not required for admission.

The program is accredited by the Council for Interior Design Accreditation (CIDA). Graduates of the program may seek employment as interior design professionals in interior design and architectural firms, corporations, institutions, government offices, or as design and sales professionals for systems furnishing and interior design product manufacturers. Some graduates have pursued advanced degrees in interior design, architecture, fine arts, facilities management, and business administration. After 3,520 hours of qualified professional work experience (half of which may be completed as a student via co-op), graduates may sit for the NCIDQ examination for professional certification.

Student Outcomes
Upon graduation from the interior design program students should be able to demonstrate:
• creativity and artistic vision
• fluency with a design process
• broad intellectual depth
• technical skills and the craft of making
• knowledge of the business of design
• the ability to work efficiently both independently and collaboratively in teams
• an understanding of professional fiduciary responsibilities to the general public including but not limited to ethical practice, regulatory requirements, and resource conservation and sustainability

Total credits for degree: 134

Design Studio Grade Requirement
The following grade requirement must be achieved to earn a Bachelor of Science degree in Interior Design. This requirement applies to: INTD1000 INTERIOR STUDIO I, INTD1500 INTERIOR STUDIO II, INTD2000 INTERIOR STUDIO III, INTD2500 INTERIOR STUDIO IV, INTD3000 INTERIOR STUDIO V, INTD3500 INTERIOR STUDIO VI, INTD4000 INTERIOR STUDIO VII, and INTD5500 SENIOR PROJECT: DESIGN.

The final grade must be a C or better if the final grade in the previous design studio was less than a C. Students who receive a grade below a C for two consecutive semesters are not permitted to continue in the studio sequence until they successfully repeat the second studio for which they received a substandard grade.

Interior Design (BINT)

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**ENGL/HSS Note**

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the six humanities and social science electives, BINT students must include the following **HSS Directed Electives**:

- An Art History Elective
- A PSYC/SOCL Elective
COLLEGE OF ARTS AND SCIENCES

Patrick F. Hafford, Dean
Dobbs Hall, Room 301
(617) 989-4870

Mission

The College of Arts and Sciences is essential to the education of all students at Wentworth Institute of Technology. Our college provides students in all disciplines with a deeper understanding of the foundations of their work, as well as the global challenges that require innovation and creativity. Courses and programs emphasize critical thinking, problem solving, data interpretation, ethics, and diverse communication and leadership skills. Our students hone the professional skills and theoretical expertise that distinguish them, beyond their specialization, as self-motivated and engaged citizens who possess the ability to adapt to the evolving future requirements of society.

Vision

To be recognized as a provider of cutting-edge interdisciplinary education that will offer students opportunities for personal growth and creativity, which will serve as the cornerstone of their successful careers.

The College of Arts and Sciences offers four undergraduate programs and two graduate programs:

• The Bachelor of Science in Applied Mathematics (BSAM) program is a three-year degree (a four-year option is also available) that is geared toward students who wish to apply mathematics to solve problems faced by industry, government, biological science, and physical science.
• The Bachelor of Science in Applied Science (BSAS) degree offers a thorough grounding in biology, chemistry, and physics. The program is focused on the interdisciplinary nature of science and trains students with the technical skills for research, laboratory investigation, and scientific computing.
• The Bachelor of Science in Business Management (BSM) degree is designed to help students become leaders by acquiring knowledge and competencies in management with optional concentrations in either project management or entrepreneurship.
• The Bachelor of Science in Computer Information Systems (BSIS) is an interdisciplinary major offering a solid background in the analysis, design, development, deployment, and administration of computer-based information systems within a business management context.
• The Bachelor of Science in Project Management (BSPM) degree is offered jointly with the College of Professional and Continuing Education in a fully online or on-campus format. This major prepares the students to be project management leaders using the principles of the Project Management Institute (PMI) taught by project management professionals.
• The Master of Science in Technology Management (MSTM) is offered jointly with the College of Professional and Continuing Education in a fully online format. Classes are geared toward working professionals seeking to develop the knowledge and skills necessary to lead and manage in a technologically focused business environment. The online degree is designed to elevate students’ business acumen, strategic thinking, and people skills, all within the context of the issues and challenges specific to the technical world.
• The Master of Science in Project Management (MSPM) is offered jointly with the College of Professional and Continuing Education in a fully online format. The program provides graduates with a clear understanding of the management skills, expertise and ethics necessary to be successful as a project and project portfolio manager. Topics to be covered include communication strategies, technology project management, leadership, leveraging technical innovation and intellectual property, accounting and finance, new product development and commercialization, and global operations.

Applied Mathematics Department

Vision

The Applied Mathematics Department is an integral part of the larger academic community at Wentworth. Our course offerings reflect our commitment to students’ mastery of both mathematical principles and their applications in other disciplines. Through coursework, research projects, cooperative work experiences, and seminars, students hone their problem-solving skills and develop subject matter expertise that will serve them in a wide range of careers.

Mission

Wentworth’s Applied Mathematics Department promotes the academic community’s understanding of mathematics and its applications by:

• Reinforcing the utility of mathematical expertise in engineering, technology, and/or design;
• Providing opportunities for students to gain broad foundational working expertise in mathematical techniques and experience in finding mathematical solutions;
• Creating situations where students are driven to consider the necessity for mathematical models, rigor, and thought, in the careful and effective application of mathematical tools to problems related to industry, science, and technology;
• Collaborating with other departments to help formulate and resolve research problems and to meet the mathematical needs of their students;
• Collaborating with industry partners to solve mathematical problems, create student job opportunities, and seek curricular advice;
• Supporting the mission of the University by empowering, inspiring, and innovating through experiential learning by means of our departmental offerings.

Department Chair
• Amanda Hattaway, Ph.D.

Professor
• Gary M. Simundza, M.S.

Associate Professor
• Robert C. Cournoyer, M.S.
• Amanda Hattaway, Ph.D.
• Dwight F. Horan, M.Ed.
• Mark Mixer, Ph.D.
• Emma Smith Zbarsky, Ph.D.
Applied Mathematics Bachelor of Science

Leading to a Bachelor of Science Degree in Applied Mathematics

Wentworth Institute of Technology offers a three-year B.S. in Applied Mathematics, in which Applied Math majors take six semesters of classes and complete two marketable applied math co-ops. Graduates, in addition to continuing their education at the graduate level, may seek employment in a variety of fields including government, finance, risk-management and actuarial science, predictive modeling, data science, research, operations research, quality assurance, software engineering, statistics, biomedicine, and informatics.

While the degree is designed as a three-year program, students may opt to complete the degree in four years. Please contact the Applied Mathematics department for more information.

Student Outcomes
Program graduates will be able to:

- Apply mathematical concepts to perform computations, model phenomena, and write proofs.
- Effectively use mathematical software packages for computation, modeling, and presentations.
- Write code in a high-level computer programming language.
- Deliver clear and precise, written and oral presentations, demonstrating: (1) comprehension of mathematical content and (2) the ability to communicate that mathematical content to different audiences.
- Apply mathematics in a professional setting.

Three Year Program
Total Required Credits: 120

Course | Title |
--- | --- |
Spring Semester | Credits |
MATH1850 | ENGINEERING CALCULUS II | 4
MATH2300 | DISCRETE MATHEMATICS | 4
COMP1050 | COMPUTER SCIENCE II | 4
PHYS1750 | ENGINEERING PHYSICS II | 4
English Sequence | | 4
Summer Semester | Credits |
COOP3000 | PRE CO-OP WORK TERM (Optional) | 0
Second Year | Credits |
Fall Semester | | 0
MATH2025 | MULTIVARIABLE CALCULUS | 4
MATH2100 | PROBABILITY & STATISTICS FOR ENGINEERS | 4
MATH2550 | TRANSITION TO ADVANCED MATH | 4
MATH3900 | NUMERICAL ANALYSIS I | 4
HSS Elective | | 4
Spring Semester | Credits |
MATH2200 | ADVANCED STATISTICS | 4
MATH2500 | DIFFERENTIAL EQUATIONS | 4
MATH2860 | LINEAR ALGEBRA & MATRIX THEORY | 4
MATH3950 | NUMERICAL ANALYSIS II | 4
HSS Elective | | 4
Summer Semester | Credits |
COOP3500 | COOP EDUCATION 1 | 0
Third Year | Credits |
Fall Semester | | 0
MATH3700 | OPERATIONS RESEARCH | 4
MATH4900 | PARTIAL DIFFERENTIAL EQUATIONS | 4
Technical Elective (p. 83 | | 4
Technical Elective (p. 83 | | 4
HSS Elective | | 4
Spring Semester | Credits |
COOP4500 | COOP EDUCATION 2 | 0
Summer Semester | Credits |
MATH5000 | APPLIED MATHEMATICS FINAL YEAR DESIGN I | 4
Technical Elective (p. 83 | | 4
Technical Elective (p. 83 | | 4
HSS Elective | | 4
HSS Elective | | 4
Total Credits | | 120
Non-coursework Requirement

In addition to the above coursework requirements, students are required to complete the following non-coursework degree requirements:

- One public lecture
- A website
- A poster presentation

ENGL/HSS Note

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Technical Electives:

A total of 20 semester credit hours of technical electives must be taken as a part of the program. One of the four technical electives must be either MATH4875 REAL ANALYSIS I, MATH4575 COMPLEX VARIABLES, OR MATH4400 INTRODUCTION TO ABSTRACT ALGEBRA. Students may choose, after consultation with their primary advisor, among the electives offered each semester. Technical elective courses include biological, financial, and physical science applications through courses offered by the Applied Mathematics Department including:

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Four Year Program

Total Required Credits: 120

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Table 83
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<td>MATH4900</td>
<td>PARTIAL DIFFERENTIAL EQUATIONS</td>
<td>4</td>
</tr>
</tbody>
</table>

**Technical Elective (p. 84)**

| Credits       | 4       |

**Spring Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP4500</td>
<td>COOP EDUCATION 2</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Summer Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH5000</td>
<td>APPLIED MATHEMATICS FINAL YEAR DESIGN I</td>
<td>4</td>
</tr>
</tbody>
</table>

**Technical Elective (p. 84)**

| Credits       | 4       |

**HSS Elective**

| Credits       | 4       |

**Total Credits**

| Total Credits | 120     |

### Non-coursework Requirement

In addition to the above coursework requirements, students are required to complete the following non-coursework degree requirements:

- One public lecture
- A website
- A poster presentation

### ENGL/HSS Note

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

### Technical Electives:

A total of 20 semester credit hours of technical electives must be taken as a part of the program. One of the four technical electives must be either MATH4875 REAL ANALYSIS I, MATH4575 COMPLEX VARIABLES, OR MATH4000 INTRODUCTION TO ABSTRACT ALGEBRA.

Students may choose, after consultation with their primary advisor, among the electives offered each semester. Technical elective courses include biological, financial, and physical science applications through courses offered by the Applied Mathematics Department including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH1950</td>
<td>FINANCIAL MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>MATH2250</td>
<td>TIME SERIES</td>
<td>4</td>
</tr>
</tbody>
</table>

### Applied Mathematics Minor

The minor in Applied Mathematics provides a focus for students who are interested in the subject and want to integrate an aspect of applied mathematics with their major. To earn the minor, the student must complete three core courses and two elective courses, all with a grade of "C" or higher.

#### Course Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH2100</td>
<td>PROBABILITY &amp; STATISTICS FOR ENGINEERS</td>
<td>4</td>
</tr>
<tr>
<td>MATH2750</td>
<td>DIFFERENTIAL EQUATIONS &amp; SYSTEMS MODELING</td>
<td>4</td>
</tr>
<tr>
<td>MATH2860</td>
<td>LINEAR ALGEBRA &amp; MATRIX THEORY</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Elective Requirement

Select two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH1950</td>
<td>FINANCIAL MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>MATH2200</td>
<td>ADVANCED STATISTICS</td>
<td>4</td>
</tr>
<tr>
<td>MATH2250</td>
<td>TIME SERIES</td>
<td>4</td>
</tr>
<tr>
<td>MATH2300</td>
<td>DISCRETE MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>MATH2425</td>
<td>CRYPTOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>MATH3150</td>
<td>STOCHASTIC PROCESSES</td>
<td>4</td>
</tr>
<tr>
<td>MATH3225</td>
<td>FUNCTIONAL ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>MATH3250</td>
<td>HAZARD &amp; CATASTROPHE MODELING</td>
<td>4</td>
</tr>
<tr>
<td>MATH3500</td>
<td>CALCULUS IV</td>
<td>4</td>
</tr>
<tr>
<td>MATH3700</td>
<td>OPERATIONS RESEARCH</td>
<td>4</td>
</tr>
</tbody>
</table>

84
## Financial Mathematics Minor

The minor in Financial Mathematics provides students with the fundamentals of risk and financial modeling. Additionally, students will be well-prepared to take the first two Society of Actuaries (SOA) exams: Exam P, Probability and Exam FM, Financial Math. To earn a minor in Financial Mathematics students must complete a total of sixteen (16) credits. Students will also be required to complete the three (3) pre-requisite courses (12 credits) prior to entering the required course sequence. The Financial Mathematics minor is not available to Applied Mathematics majors.

### Prerequisite Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH1750</td>
<td>ENGINEERING CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>MATH1850</td>
<td>ENGINEERING CALCULUS II</td>
<td>4</td>
</tr>
<tr>
<td>MATH2100</td>
<td>PROBABILITY &amp; STATISTICS FOR ENGINEERS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

### Core Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH1950</td>
<td>FINANCIAL MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>MATH2250</td>
<td>TIME SERIES</td>
<td>4</td>
</tr>
<tr>
<td>MATH4475</td>
<td>ACTUARIAL MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Select one of the following Economics courses:</strong></td>
<td></td>
</tr>
<tr>
<td>ECON4102</td>
<td>PRINCIPLES OF ECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON4152</td>
<td>MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON4154</td>
<td>MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

To earn the Data Science minor, students must successfully complete 20 credits (5 courses, 4 credits each). To enroll in the minor, students must successfully complete each of the two prerequisite courses.

### Data Science Minor

The Data Science minor provides students with the necessary analytical skills to gather and analyze (big) data and introduces principal components of machine learning to infer from processed data and share results in a meaningful way.

To earn the Data Science minor, students must successfully complete 20 credits (5 courses, 4 credits each). To enroll in the minor, students must successfully complete each of the two prerequisite courses.
Students are required to complete a minimum of 28 credits from the department offerings, comprised of the English sequence and five electives in humanities and social science courses, with at least one course from the humanities and one course from the social sciences.

**English Requirement**

Students must successfully complete an English sequence in order to enroll in humanities and social science electives. Which English sequence a student must complete is determined by the results of the English placement process. Based on the student’s English placement, day students will be required to complete one of the following English sequences:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL1100 &amp; ENGL2200</td>
<td>8</td>
</tr>
<tr>
<td>ENGL0900 &amp; ENGL1100 &amp; ENGL2200</td>
<td>12</td>
</tr>
<tr>
<td>ENGL0700 &amp; ENGL0800 &amp; ENGL1100</td>
<td>12</td>
</tr>
</tbody>
</table>

Once matriculated, students’ English sequence, as determined by placement, must be completed at Wentworth. In circumstances that warrant it, exceptions to this policy may be made at the discretion of the chair of the Department of Humanities and Social Science; in such cases, students must appeal to the chair of HSS directly, who may also defer to the expertise of the English faculty.

**Humanities and Social Sciences Elective Requirement**

Satisfactory completion of an English Sequence is prerequisite to all other courses in the Humanities and Social Sciences Department. All full-time students must complete a minimum of 28 credits, including English courses, from the Humanities and Social Sciences Department. Because the Humanities and Social Sciences Department believes there should be a balance of electives in the student’s program, day program students are required to complete:

- At least one course in humanities
- At least one course in the social sciences
- The remaining courses from either the humanities or social sciences category

To complete the humanities and social science graduation requirement, the entire 20 elective credits may not be taken exclusively in humanities or exclusively social sciences. Students whose English Sequence requires three English courses may use the third English course to satisfy the humanistic and social science elective requirement.

Students in programs with Directed HSS Electives may use the directed elective course(s) to satisfy the humanities or social science as determined by that HSS course.
A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

**Department Chair**
- Ronald R. Bernier, Ph.D.

**Professor**
- Ronald R. Bernier, Ph.D.
- Beth Anne Cooke-Cornell, M.A.
- Leon L. Cort, Ph.D.
- Christopher S. Gleason, Ph.D.
- Gloria Monaghan, M.A.
- Jonathan G. Ripley, Ph.D.
- Elaine A. Slater, M.A.

**Associate Professor**
- David J. Downey, M.A.
- Lisa Falvey, Ph.D.
- Jody Michael Gordon, Ph.D.
- Ella Howard, Ph.D.
- Kristen Nielsen, Ph.D.
- Edward Rooney, M.A.
- Kristen Hudak Rosero, Ph.D.
- Phyllis Wentworth, Ph.D.

**Assistant Professor**
- Paul Firenze, Ph.D.
- Mark John Isola, Ph.D.
- Allison Lange, Ph.D.
- Faith Litchock-Morellato, M.A.T.
- Juval V. Raclelis, Ph.D.
- Ronen Shay, Ph.D.
- Cynthia Williams, Ph.D.
- Allen W. Wong, Ph.D.

**Media, Culture, and Communication Studies Minor**

The Media, Culture, and Communication Studies (MCCS) minor is aimed at providing a focus for students who, while completing their humanities and social sciences electives, are interested in exploring the role of the digital technologies in the study of contemporary culture.

**MCCS Learning Outcomes and Objectives:**
- Project-based experiential learning
- Facility with interactive digital learning tools and media
- Familiarity with current and emerging technologies in media and culture
- Media literacy from written, production, and analytical perspectives
- Close reading and textual analysis
- Critical thinking and persuasive writing

**Minor Requirements**

To earn the Minor in Media, Culture, and Communications Studies, students must select from the following courses, as listed below, earning a grade of "C" or better.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUMN4051</td>
<td>MEDIA CULTURE &amp; COMMUNICATIONS</td>
<td>4</td>
</tr>
<tr>
<td>HUMN4053</td>
<td>MCCS STUDIO</td>
<td>4</td>
</tr>
</tbody>
</table>

Select three of the following electives:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM4112</td>
<td>SOCIAL PERSPECTIVES JOURNALISM</td>
</tr>
<tr>
<td>COMM4262</td>
<td>PUBLIC RELATIONS WRITING</td>
</tr>
<tr>
<td>COMM4305</td>
<td>WEB ANALYTICS &amp; MEDIA RESEARCH</td>
</tr>
<tr>
<td>COMM4310</td>
<td>MEDIA &amp; INNOVATION MANAGEMENT</td>
</tr>
<tr>
<td>COMM4315</td>
<td>INTRODUCTION TO ADVERTISING</td>
</tr>
<tr>
<td>COMM4320</td>
<td>COMMUNICATION WITH PHOTOGRAPHY</td>
</tr>
<tr>
<td>COMM4325</td>
<td>COMMUNICATING WITH VIDEO</td>
</tr>
<tr>
<td>HUMN4225</td>
<td>TELEVISION STUDIES</td>
</tr>
<tr>
<td>HUMN4241</td>
<td>GRAPHIC NOVEL TO FILM</td>
</tr>
<tr>
<td>HUMN4243</td>
<td>CONTEMPORARY ART &amp; THEORY</td>
</tr>
<tr>
<td>HUMN4275</td>
<td>MYTH AMERICA: FROM COLONIES TO CULTURE WARS</td>
</tr>
<tr>
<td>HUMN4345</td>
<td>HISTORY OF AMERICAN FOLK MUSIC</td>
</tr>
<tr>
<td>HUMN4373</td>
<td>SHAKESPEARE ON FILM</td>
</tr>
<tr>
<td>SOCL4212</td>
<td>ART &amp; TECHNOLOGY</td>
</tr>
</tbody>
</table>

Total Credits: 20

Special Topics courses in Humanities and Social Science (3800) when offered may satisfy one or more of the elective requirements

All 3800 courses will require a Course Substitution Form (https://wit.edu/ssc/forms) submitted to the SSC to insure they are applied to the Media, Culture, and Communications Studies requirement/s. Contact the Department of Humanities and Social Science for a list of courses available by semester.

**Performing Arts Minor (COF Only)**

The minor in performing arts is offered through the Colleges of the Fenway, and allows students to explore the performing arts in both academic and performance settings.

To earn the minor, students must complete the following:

Five courses, including:

- Introduction to Performing Arts, offered at Emmanuel College in the spring semester.
- One course each in music, dance, and theater, for three total courses. The Colleges of the Fenway provides a list of appropriate courses on their website (www.colleges-fenway.org) prior to each semester.
- One upper-level elective course, with appropriate courses also provided via the COF website.
- Three semesters of participation in an approved performing arts ensemble. The ensembles include but are not limited to: COF Orchestra, COF Chorus, COF Dance Project, COF Theater Project, COF Jazz Band, Emmanuel College Theater Productions, Emmanuel
Management Department

Mission

The Department of Management's mission is to offer a comprehensive educational experience through relevant course work, seminars, and exercises in management to enable students to become successful industry professionals and leaders of the 21st century. We challenge our students to develop the skills to analyze and solve problems, and to develop an aptitude for lifelong learning. We offer interesting and challenging programs leading to exciting careers in the various fields of business management, project management and computer information systems.

Department Chair

• Leonard DeLosh, M.B.A.

Professor

• Hossein Noorian, M.B.A.
• Cindy P. Stevens, Ph.D.

Associate Professor

• Leonard DeLosh, M.B.A.
• Hollis Greenberg, M.B.A.
• Michael Mozill, M.B.A.
• Frederick Trilling, J.D.

Assistant Professor

• Santiago Umaschi, M.B.A.

Business Management Bachelor of Science

Leading to a Bachelor of Science Degree in Business Management

Students enrolled in the Business Management (BSM) program are exposed to the functional areas of management and gain the various managerial and analytical skills necessary to successfully administer human, natural, and technological resources within an organization. A study of financial analysis, marketing principles, operations management, manufacturing, strategic management, economics, organizational behavior, information systems, and the legal aspects of business are introduced in this program. In addition, Business Management (BSM) students have the opportunity to select a four-course concentration in either Project Management or Entrepreneurship. The management skills that students acquire in the classroom are applied during two required cooperative work semesters.

The discipline of management requires of practitioners both technical knowledge and the skills to communicate. From the first year through the senior year, BSM students are required to compile an electronic career portfolio (ECP) of their work in consultation with their academic advisors. The ECP requirement guidelines are available in the Management Department office. In the spring semester of the senior year, seniors register for their final graded portfolio assessment.

Graduates of the Business Management (BSM) program may seek entry-level management positions in project management, marketing and communications, IT management, accounting and finance, entrepreneurship, human resources, quality assurance analysts and research and operations management. Students are encouraged to pursue graduate degrees in business, law, public administration, and other related fields.

Program Educational Objectives

Student Outcomes

By the time of graduation, students will be able to:

• Demonstrate knowledge of the fundamental principles in the functional areas of business
• Explain the global dimensions of business
• Apply ethical principles to leadership decisions
• Apply quantitative decision-support tools in decision making
• Demonstrate effective professional communication skills
• Integrate learning to address real world problems

Total credits for degree: 135

This is a four-year program, which starts in the fall semester of the student's first year and is planned to end in the summer semester of the student's fourth year.

Additionally, students in this major complete four courses in either Project Management or Entrepreneurship as part of the degree requirements.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT1000</td>
<td>INTRODUCTION TO MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MGMT1025</td>
<td>COMPUTER BUSINESS APPLICATIONS</td>
<td>4</td>
</tr>
<tr>
<td>MATH1040</td>
<td>APPLIED MATHEMATICS FOR BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>English Sequence</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT1500</td>
<td>DECISION ANALYSIS FOR BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>MGMT2750</td>
<td>INTEGRATIVE FINANCIAL ACCOUNTING</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Science Elective</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>English Sequence</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT2000</td>
<td>MANAGEMENT INFORMATION SYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>MGMT2100</td>
<td>MANAGEMENT COMMUNICATIONS</td>
<td>4</td>
</tr>
<tr>
<td>MGMT2200</td>
<td>RESEARCH METHODS IN BUSINESS</td>
<td>4</td>
</tr>
<tr>
<td>HSS Elective</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>
### Course Title Credits

#### Spring Semester
- MGMT2500 SYSTEMS ANALYSIS & DESIGN 3
- MGMT2850 PRINCIPLES OF MARKETING 4
- MGMT3250 MANAGERIAL ACCOUNTING 4
- MGMT Elective Concentration Course I 3
- HSS Elective 4

**Credits** 18

#### Summer Semester
- COOP3000 PRE CO-OP WORK TERM 0

**Credits** 0

#### Junior Year

**Fall Semester**
- MGMT3000 MANAGING & LEADING ORGANIZATIONS 4
- MGMT3650 BUSINESS LAW 4
- MGMT Elective Concentration Course II 3
- General Elective 3
- HSS Elective 4

**Credits** 18

**Spring Semester**
- COOP3500 COOP EDUCATION 1 0

**Credits** 0

#### Senior Year

**Fall Semester**
- COOP4500 COOP EDUCATION 2 0

**Credits** 0

**Spring Semester**
- MGMT4250 STRATEGIC MANAGEMENT 4
- MGMT4300 INTEGRATIVE SEMINAR 3
- MGMT4400 BUSINESS NEGOTIATION PRINCIPLES 3
- MGMT Elective Concentration Course IV 4
- HSS Elective 4

**Credits** 19

### ENGL/HSS Note

Day program students are required to complete:
- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the six humanities and social science electives, BSM students must include the following HSS Directed Electives:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON4152</td>
<td>MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECON4154</td>
<td>MICROECONOMICS</td>
<td>4</td>
</tr>
</tbody>
</table>

An Ethics elective

### Project Management, Entrepreneurship, or Cybersecurity Management Concentrations (Optional)

#### Project Management Concentration Courses

Complete the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT2060</td>
<td>INTRODUCTION TO TECHNOLOGY PROJECT MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>MGMT3060</td>
<td>TECHNOLOGY ACQUISITION</td>
<td>3</td>
</tr>
<tr>
<td>MGMT3560</td>
<td>GROUP PROCESSES &amp; TEAM BUILDING</td>
<td>4</td>
</tr>
<tr>
<td>MGMT4060</td>
<td>TECHNOLOGY PROJECT MANAGEMENT SEMINAR</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Credits** 14

#### Entrepreneurship Concentration Courses

Complete the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT2065</td>
<td>INTRODUCTION TO ENTREPRENEURSHIP</td>
<td>3</td>
</tr>
<tr>
<td>MGMT3065</td>
<td>ENTREPRENEURIAL MARKETING</td>
<td>3</td>
</tr>
<tr>
<td>MGMT3565</td>
<td>TECHNOLOGY ENTREPRENEURSHIP</td>
<td>4</td>
</tr>
<tr>
<td>MGMT4165</td>
<td>CREATING NEW VENTURES</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Credits** 14

#### Cybersecurity Management Concentration Courses

Complete the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP2500</td>
<td>SECURITY PRINCIPLES</td>
<td>4</td>
</tr>
<tr>
<td>MGMT2560</td>
<td>CYBERSECURITY LAW AND POLICY</td>
<td>3</td>
</tr>
<tr>
<td>MGMT2650</td>
<td>CYBERSECURITY PLANNING</td>
<td>3</td>
</tr>
<tr>
<td>MGMT2800</td>
<td>CYBERSECURITY MANAGEMENT</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Credits** 14

### Computer Information Systems Bachelor of Science
Leading to the Bachelor of Science Degree in Computer Information Systems

The B.S. in Computer Information Systems links the worlds of business and computer science. It is the study of business organizations and the programming, databases, and networks that support them. Functioning at the intersection of business and technology, it offers an interdisciplinary education that neither discipline alone can provide. Courses span computer science, business management, math, science, humanities, and social sciences. Three open electives (two in computer science and one in management) give students the option to choose courses from either business management (such as project management or finance) or computer science (such as databases or software development).

This program offers a solid background in the analysis, design, development, deployment, and administration of computer-based information systems within a business management context. Students will complement business skills with strong technical skills in databases, systems analysis and design, business processes, organizational behavior, networking and telecommunications, and project management, along with problem solving skills. Graduates will be well prepared for the growing number of opportunities in CIS and information technology.

Program Educational Objectives

Student Outcomes

By the time of graduation, students will be able to:

• Support the delivery and management of information systems within a specific application environment
• Analyze a problem, and identify and define the computing requirements appropriate to its solution
• Demonstrate effective professional communication skills
• Function effectively on teams to accomplish a common goal
• Analyze the global impact of technology on individuals, organizations, and society
• Make judgments and draw appropriate conclusions based on quantitative analysis
• Apply ethical principles to professional activities and duties

Total credits for degree: 134

This is a four-year program starting in the fall semester of the student’s first year and planned to end in the summer semester of the student’s fourth year. Management or Computer Electives are chosen in consultation with the student’s primary advisor.

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<thead>
<tr>
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<tr>
<td>MGMT1025</td>
<td>COMPUTER BUSINESS APPLICATIONS</td>
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<tr>
<td>MGMT1000</td>
<td>INTRODUCTION TO MANAGEMENT</td>
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Sophomore Year

Fall Semester

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<td>or MATH1030</td>
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<td>MGMT2500</td>
<td>SYSTEMS ANALYSIS &amp; DESIGN</td>
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<td>MGMT2550</td>
<td>APPLIED PROJECT MANAGEMENT</td>
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Junior Year

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Summer Semester

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<td>MGMT3650</td>
<td>BUSINESS LAW</td>
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Spring Semester

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<td>HSS Elective</td>
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Summer Semester

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<tr>
<td>MGMT3100</td>
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Project Management Master of Science

Leading to a Master of Science Degree in Project Management

The Master of Science in Project Management (MSPM) is offered as a fully online program which enables part-time students to complete the Masters degree in less than 2 years. The Master of Science in Project Management (MSPM) is designed for working professionals who want to advance their technical skills while learning the most up-to-date and innovative management strategies. In this program, students will gain valuable, hands-on experience in initiating, planning, executing, controlling, and closing a project on time and on budget; using the latest project management software and technology. Our unique mix of courses, including Troubled Projects, ERP and Virtual Project Management, will give you a competitive advantage in today’s rapidly changing IT environment and can get you well on the road to becoming a skilled project manager in as little as two years.

Topics covered in the MSPM include:

- Communications strategies
- Technology project management
- Leadership
- Leveraging technical innovation and intellectual property
- Accounting and finance
- New product development and commercialization
- Global operations

Program Educational Objectives

- Create, manage and deliver a project plan from inception to completion, including project scope, risk, quality and performance metrics
- Evaluate potential projects and justify the selection of an appropriate project portfolio
- Effectively communicate and ethically manage project teams, including virtual teams, using appropriate project management tools and techniques
- Manage ERP projects and gain efficiencies through business process integration and automation.

Student Outcomes

Upon completion, Master of Science in Project Management graduates will be able to:

- Create, manage and deliver a project plan from inception to completion, including project scope, risk, quality and performance metrics
- Evaluate potential projects and justify the selection of an appropriate project portfolio
- Effectively communicate and ethically manage project teams, including virtual teams, using appropriate project management tools and techniques
- Manage ERP projects and gain efficiencies through business process integration and automation

Required Courses

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<tr>
<th>Course</th>
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<td>MGMT7125</td>
<td>RISK MANAGEMENT</td>
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<tr>
<td>MGMT7225</td>
<td>PROJECT TEAM BUILDING &amp; LEADERSHIP</td>
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<tr>
<td>MGMT7325</td>
<td>AGILE PROJECT MANAGEMENT</td>
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<tr>
<td>MGMT7425</td>
<td>MANAGING TROUBLED PROJECTS</td>
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<tr>
<td>MGMT7450</td>
<td>COMMUNICATION STRATEGIES</td>
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<td>MGMT7525</td>
<td>GLOBAL &amp; VIRTUAL PROJECT MANAGEMENT</td>
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<tr>
<td>MGMT7625</td>
<td>MANAGING ERP SYSTEMS</td>
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<td>MGMT7725</td>
<td>PORTFOLIO &amp; PROGRAM MANAGEMENT</td>
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<td>MGMT7825</td>
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Recommended Schedule for MS in Project Management (MSPM)

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<tr>
<td>MGMT7025</td>
<td>PROJECT SCHEDULING &amp; COST PLANNING</td>
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<td>MGMT7125</td>
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<tr>
<td>MGMT7225</td>
<td>PROJECT TEAM BUILDING &amp; LEADERSHIP</td>
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Technology Management Master of Science

Leading to a Master of Science Degree in Technology Management

The Master of Science in Technology Management (MSTM) degree is designed to elevate students' business acumen, strategic thinking, and people skills, all within the context of the issues and challenges specific to the technical world. Graduates of the MSTM program will be equipped with the management skills, expertise, and ethics necessary to be successful within technology-based enterprises.

Mission

The MSTM program is designed to combine common general management techniques with current technology management practices and technologies. The curriculum will provide graduates with the tools and managerial decision-making processes related specifically to maintaining and managing in a technical environment. The MSTM program will be taught using a combination of technologies and team instruction. It is anticipated that courses will utilize both industry professionals as well as academic experts. The program will provide graduates with a clear understanding of the management skills, expertise and ethics necessary to be successful within the technology-based enterprises. Topics to be covered will include: communication strategies, technology project management, leadership, leveraging technical innovation and intellectual property, accounting and finance, new product development and commercialization, and global operations.

Program Educational Objectives

Graduates of the Master of Science in Technology Management program will be prepared for a variety of managerial positions in the technical world. The program will be to provide graduates with the knowledge and skill sets needed to function successfully in middle and upper level technology management positions.

Student Outcomes

Master of Science in Technology Management graduates will:

- Understand the theory and application of advanced business management theories
- Demonstrate an understanding of strategic technology management
- Demonstrate an understanding of finance and accounting
- Demonstrate leadership qualities
- Understand the critical success factors for leading teams and related organizational development issues
- Understand the relevance of the increasingly international business environment
- Demonstrate executive level decision-making and critical thinking skills
- Demonstrate the ability to deal with complex business challenges, and utilize best practices to arrive at solution sets required of mid and senior level technology managers

Required Courses

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<td>MGMT7050</td>
<td>BUSINESS FINANCE &amp; INVESTMENT</td>
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<tr>
<td>MGMT7100</td>
<td>PROJECT MANAGEMENT APPLICATIONS</td>
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<td>MGMT7150</td>
<td>BUSINESS OPERATIONS &amp; PROCESS MANAGEMENT</td>
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<tr>
<td>MGMT7200</td>
<td>LEADERSHIP</td>
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<td>MGMT7350</td>
<td>MARKETING MANAGEMENT</td>
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<td>MGMT7450</td>
<td>COMMUNICATION STRATEGIES</td>
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<td>TMGT8000</td>
<td>STRATEGIC TECHNOLOGY FOR BUSINESS MANAGEMENT</td>
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<td>TMGT8100</td>
<td>MANAGEMENT OF NEW PRODUCT DEVELOPMENT</td>
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Total credits for degree: 30

MSTM Recommended Schedule

Course Title Credits

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Semester Two

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Semester Three

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<td>MGMT7150</td>
<td>BUSINESS OPERATIONS &amp; PROCESS MANAGEMENT</td>
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Business Analytics Minor

The Business Analytics Minor teaches students how to interpret large data sets, develop actionable insights, and communicate those insights to stakeholders to make informed decisions that draw on market data.

Course Title Credits
Select one of the following courses
MGMT1500 DECISION ANALYSIS FOR BUSINESS 4
MATH1030 STATISTICS & APPLICATIONS 4
or MATH2100 PROBABILITY & STATISTICS FOR ENGINEERS
COMM4305 WEB ANALYTICS & MEDIA RESEARCH 4

Select 4 electives from the following courses: 3 of which must be from different departments.
Computer Science
COMP3125 DATA SCIENCE FUNDAMENTALS 4

Applied Mathematics
MATH1030 STATISTICS & APPLICATIONS 4
MATH1900 INTRODUCTION TO OPERATIONS RESEARCH 4
MATH2800 FINITE MATH 4

Humanities & Social Science
COMM4305 WEB ANALYTICS & MEDIA RESEARCH 4
ECON4152 MACROECONOMICS 4

Management
MGMT1500 DECISION ANALYSIS FOR BUSINESS 4
MGMT2000 MANAGEMENT INFORMATION SYSTEMS 4
MGMT2500 SYSTEMS ANALYSIS & DESIGN 3

Total Credits 16

Business Management Minor

There are three options for the Business Management minor. Each option includes three common core courses and two additional courses, for a total of five courses accounting for 17 to 18 credits, depending on the courses taken.

Course Title Credits
Required Courses
MGMT2700 FINANCIAL ACCOUNTING 3
MGMT3000 MANAGING & LEADING ORGANIZATIONS
MGMT2850 PRINCIPLES OF MARKETING 4

Select one of the following options: 6-7
Option 1: General Business
Select two of the following:
MGMT2500 SYSTEMS ANALYSIS & DESIGN 3
MGMT3650 BUSINESS LAW 4
MGMT3700 HUMAN RESOURCES & LABOR MANAGEMENT
MGMT4400 BUSINESS NEGOTIATION PRINCIPLES 3

Option 2: Entrepreneurship
Required courses:
MGMT2065 INTRODUCTION TO ENTREPRENEURSHIP 3
MGMT4165 CREATING NEW VENTURES 4

Option 3: Project Management
Required courses:
MGMT2060 INTRODUCTION TO TECHNOLOGY PROJECT MANAGEMENT 3
MGMT3560 GROUP PROCESSES & TEAM BUILDING 4

Total Credits 17-18

Cybersecurity Management Minor

Cybersecurity Management courses are designed not only to train managers for the cybersecurity industry, but also to provide cybersecurity skills to managers in every other industry. Cybersecurity is perhaps the single most mission-critical aspect of the world today – in business, government and the military. Computer networks, systems and data are at risk from many threat sectors; managers are needed who understand how to manage the cyber aspects of their organizations. Security principles are taught along with management, planning, and law & policy properties of cybersecurity. There is a worldwide cyber workforce gap of millions of important, high-paying jobs, the gap predicted to continue through at least 2030. These courses are interdisciplinary including both the Business Management and Cybersecurity programs.

Course Title Credits
Required Courses
COMP2500 SECURITY PRINCIPLES 4
MGMT2560 CYBERSECURITY LAW AND POLICY 3
MGMT2650 CYBERSECURITY PLANNING 3
MGMT2800 CYBERSECURITY MANAGEMENT 4
MGMT3000 MANAGING & LEADING ORGANIZATIONS 4

Total Credits 18

Sciences Department

Department Mission and Vision Statement

Mission
The Department of Sciences delivers a variety of challenging and motivating scientific experiences in chemistry, biology, and physics.
Through close work with our faculty and undergraduate research opportunities, we impart scientific literacy and support student success across all programs at the Institute.

Vision
Our vision is to empower students to think critically, evaluate the world through analysis of theory and experiment, and effectively communicate their findings. We seek to provide transformational experiences in the three fundamental fields of science. Using the EPIC (externally collaborative, project-based, interdisciplinary culture) Learning model, we create lifelong learners and foster a deep appreciation for the sciences.

Department Chair
• Franz Rueckert, Ph.D.

Professor
• Gergely Sirokman, Ph.D.

Associate Professor
• Laurie E. Grove, Ph.D.
• Robert Moran, Ph.D.
• Ryan Rogers, Ph.D.
• Franz Rueckert, Ph.D.
• Richard Shurtleff, M.S.

Assistant Professor
• Douglas Goodman, Ph.D.
• Joseph Harney, M.S.
• Ben Placek, Ph.D.
• Naomi Ridge, Ph.D.
• Nadine Stecher, Ph.D.
• Omair Zubairi, Ph.D.

Applied Sciences Bachelor of Science

Leading to the Bachelor of Science Degree in Applied Sciences

The Bachelor of Science in Applied Sciences (BSAS) program is an interdisciplinary and experiential degree that gives students solid grounding in biology, chemistry, and physics — ideal for those with an interest in the sciences and a curiosity to explore and create. Applied Sciences Majors gain competence in all three disciplines through dedicated coursework and active research projects. Students acquire extensive laboratory experience and the computational aptitude to analyze and report their findings. The interdisciplinary nature of the BSAS program is in line with the expectations of today’s varied job market, preparing students for careers in research and development, technical writing, or scientific computing. Interested students will be well qualified to continue their studies in graduate programs or medical school.

Program Educational Objectives
• Develop advanced technical skills in multiple scientific disciplines
• Integrate mathematics and computer science with both the physical and life sciences
• Obtain theoretical and experimental skill sets in both the classroom and the laboratory
• Effectively communicate scientific and technical findings to a wide audience in written and oral form
• Prepare for diverse career paths, including in-demand industries like biotechnology and pharmaceuticals, or continued graduate education

Total credits for degree: 132

This is a four year program, which starts in the fall semester of the student’s first year and is planned to end in the summer semester of the student’s fourth year.

Course | Title | Credits
--- | --- | ---
Freshman Year | | |
**Fall Semester** | | |
CHEM1100 | GENERAL CHEMISTRY I | 4
MATH1750 | ENGINEERING CALCULUS I | 4
PHYS1250 | ENGINEERING PHYSICS I | 4
FYS1000 | FIRST YEAR SEMINAR | 0
English Sequence | | 4

| Credits | 16 |

**Spring Semester** | | |
BIOL1100 | CELL & MOLECULAR BIOLOGY | 4
CHEM1600 | GENERAL CHEMISTRY II | 4
MATH1850 | ENGINEERING CALCULUS II | 4
English Sequence | | 4

| Credits | 16 |

**Sophomore Year** | | |
**Fall Semester** | | |
BIOL2200 | ADVANCED MOLECULAR BIOLOGY | 4
CHEM2500 | ORGANIC CHEMISTRY I | 4
MATH2500 | DIFFERENTIAL EQUATIONS | 4
COMP1000 | COMPUTER SCIENCE I | 4
PHYS1750 | ENGINEERING PHYSICS II | 4

| Credits | 20 |

**Summer Semester** | | |
COOP3000 | PRE CO-OP WORK TERM | 0

| Credits | 0 |

**Junior Year** | | |
**Fall Semester** | | |
BIOL3200 | CELL PHYSIOLOGY & SIGNALING | 4
CHEM4200 | ADVANCED LABORATORY TECHNIQUES IN CHEMISTRY | 4
PHYS3100 | MODERN PHYSICS | 4
HSS Elective | | 4

| Credits | 16 |

**Spring Semester** | | |
COOP3500 | COOP EDUCATION 1 | 4

| Credits | 0 |
Leading to the Bachelor of Science Degree in Biological Engineering

Program Mission Statement
The mission of the Biological Engineering program is to prepare students to become practicing engineers/scientists, who will go on to be innovative problem solvers in industry, government, and academia.

Program Overview
Biological engineering is at the leading edge of emerging engineering disciplines, applying the engineering principles of analysis, synthesis, and design to biology at the molecular and cellular levels to create new products and processes. By understanding biological functions at the fundamental level, and how systems and processes are structured, new technologies, materials, and systems can be created to improve quality of life through a broad array of sectors from health care to the environment.

The Biological Engineering program provides opportunities for students who wish to study engineering, but also want to study biology because it is the fundamental building block of life sciences. This program opens opportunities for students to study science and engineering and apply the principles of each area while working with diverse applications involving living organisms.

Program Educational Objectives
Within three to five years after graduation, graduates of the Biological Engineering program will:

- Contribute significantly in the design and development of complex biological systems.
- Work effectively as members of multidisciplinary teams that analyze data critically, synthesize information and implement ethical solutions for the betterment of society.
- Prepare and present technical and scientific information professionally to various audiences.
- Further their education either through directed or independent studies to advance them personally and professionally.

Student Outcomes
By the time of graduation, students enrolled in the Biological Engineering program will be able to demonstrate the following outcomes:

1. An ability to identify, formulate, and resolve complex engineering problems by applying principles of engineering, science and mathematics.
2. An ability to apply engineering design to produce solutions that meet specific needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
5. An ability function effectively on a team whose members together provide leadership, create collaborative and inclusive environment, and societal contexts.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Total credits for degree: 132

This is a four-year program, starting in the fall of the student's first year and ending in the summer semester of the student's fourth year.

**Biological Engineering (BSBE)**

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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<td>CHEM1100</td>
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<td>BIOSTATISTICS FOR BIOENGINEERS</td>
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<td>CHEM1600</td>
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<td>BIOE3500</td>
<td>GENETICS AND TRANSGENICS</td>
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<td>Biological Engineering Elective/EPIC</td>
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**Course Title Credits**

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<td>UNIT OPERATIONS &amp; PROCESS CONTROL</td>
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<td>CHEM3550</td>
<td>BIOCHEMISTRY</td>
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<td>Senior Year</td>
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<td>BIOL3200</td>
<td>CELL PHYSIOLOGY &amp; SIGNALING</td>
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<tr>
<td>BIOE4500</td>
<td>BIOTRANSPORT PHENOMENA</td>
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<tr>
<td>ENGR5000</td>
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<td>HSS Elective</td>
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<td>BIOI4400</td>
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<td>HSS Elective</td>
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<td><strong>Credits</strong></td>
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</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>132</td>
</tr>
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</table>

**ENGL/HSS Note**

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

**Bioinformatics Minor**

For students with an interest in the applications of bioinformatics in drug discovery, diagnostics, and disease management, this minor is expected to supplement their major with a stronger foundation in the life sciences, computer science, and mathematics, which allows the student to access and manipulate the wealth of data now emerging from new technologies relating to genes, genomes, and the molecules they produce in health and disease. This minor is offered in collaboration with the Biomedical Engineering and Computer Science and Networking departments.

To complete the minor, students must pass all three core courses and any two elective courses.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>required Courses</td>
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<tr>
<td>CHEM1600</td>
<td>GENERAL CHEMISTRY II</td>
</tr>
</tbody>
</table>
### Biology Minor

The minor in biology allows students with an interest in biology applications and/or research to supplement their major with a foundation in the biological sciences and the potential for participating in interdisciplinary research-based projects.

To earn the minor, students must pass two core courses and two elective courses. At least one of the minor courses must be a research-based directed study.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>BIOL1100</td>
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<tr>
<td>BIOL1700</td>
<td>ANATOMY &amp; PHYSIOLOGY I</td>
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<td>BIOL1750</td>
<td>ANATOMY &amp; PHYSIOLOGY II</td>
<td>4</td>
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<tr>
<td>BIOL2990</td>
<td>INDEPENDENT STUDY IN BIOLOGY</td>
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<tr>
<td>BIOL3800</td>
<td>SPECIAL TOPICS IN BIOLOGY</td>
<td>4</td>
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</tbody>
</table>

**Total Credits:** 16

1. When offered as minor electives.

### Chemistry Minor

This minor allows students to supplement their major with a stronger foundation in the physical sciences. Students will be exposed to the foundations of chemistry and laboratory techniques, including common analytical instrumentation. Students will also have the opportunity to explore a topic in a subfield of chemistry through directed research or independent study.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
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<td>BASICS OF ORGANIC &amp; BIOCHEMISTRY</td>
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<td>CHEM2500</td>
<td>ORGANIC CHEMISTRY I</td>
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<td>CHEM3550</td>
<td>BIOCHEMISTRY</td>
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<tr>
<td>CHEM3800</td>
<td>SPECIAL TOPICS IN CHEMISTRY</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Credits:** 16

1. May satisfy the directed research requirement. Please check with the instructor and/or department chair.

2. All 3800 courses will require a Course Substitution Form (https://wit.edu/ssc/forms) submitted to the SSC to insure they are applied to the Physics minor requirement/s. Contact the Department of Science for a list of courses available by semester.
COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

Ali Khabari, Interim Dean
Rubenstein Hall Room 207
(617) 989-4225

Vision
Our students change the world.

Mission
To foster the education of competent, creative, entrepreneurial engineering and computer science students by dedicated faculty in innovative programs.

Education Model
Our students develop a strong technical foundation, nurture their creativity and problem-solving skills on real-world projects, sharpen innovation and entrepreneurship skills in a collaborative diverse environment, and complete at least two required semesters of co-operative work experience.

Laboratory Experience
Our students apply the theory of their discipline in state-of-the-art laboratories throughout their time at the University.

Global Impact
Our students develop competencies necessary to impact business, academia, and government in the areas of engineering and computer science for the betterment of society with broad global perspective.

Biomedical Engineering Department

Mission
Wentworth's Biomedical Engineering program is intended to train future biomedical engineers through a practice-oriented education coupled with a solid theoretical background, providing graduates with the ability to utilize technological advancements, contribute to innovative biomedical engineering design solutions in a collaborative environment, and make appropriate decisions for their areas of professional responsibility, to improve the quality of human life.

Department Chair
• Shankar M. Krishnan, Ph.D.

Professor
• Shankar M. Krishnan, Ph.D.

Assistant Professor
• Uri Feldman, Ph.D.
• Ali Kiapour, Ph.D.
• Joseph Martel-Foley, Ph.D.

Biomedical Engineering Bachelor of Science

Leading to a Bachelor of Science Degree in Biomedical Engineering

The Bachelor of Science in Biomedical Engineering program is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).

The Biomedical Engineering program focuses on designing, building, and supporting biomedical instrumentation, devices, and systems that provide solutions at the intersection of biology and medicine. The program leverages the proximity and strength of the nearby medical community to allow students to engage in valuable learning experiences and prepare them for rewarding careers in healthcare-related industries, hospitals, academic, and government research laboratories, regulatory agencies, and service agencies. It will also prepare students who may want to pursue advanced studies in graduate education in Biomedical Engineering, as well as professional programs such as medicine, dentistry, law, and business. Students will learn and build skills and expertise in electronics, signals and systems, instrumentation, biomechanics, biomaterials, and biostatistics, and collaboratively carry out interdisciplinary Biomedical Engineering capstone projects.

Students will have a choice to select from an array of Biomedical Engineering courses, including Medical Devices and Systems, Medical Imaging and Optics, Medical Informatics and Telemedicine, Clinical Engineering Practice, Design of Prosthetics and Implants, Medical Robotics and Assistive Technologies, and Artificial Intelligence and Analytics in Healthcare. The program is designed with an emphasis on Medical Devices and Systems.

Program Educational Objectives (https://wit.edu/programs/bs-biomedical)
Graduates of the Biomedical Engineering Program will be able to:
• Advance in their careers or pursue higher education in biomedical engineering or a related field.
• Apply the acquired comprehensive knowledge and engage in lifelong learning opportunities to meet the needs of the profession.
• Contribute responsibly and ethically towards impacting the biomedical engineering profession and improving human health.

Student Outcomes (https://wit.edu/programs-bs-biomedical)
Graduates of Wentworth's Biomedical Engineering program will have attained the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety,
and welfare, as well as global, cultural, social, environmental, and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Total credits for degree: 136

This is a four-year program, starting in the fall of the student’s first year and ending in the summer semester of the student’s fourth year.

After taking the prerequisite courses in math, physics, chemistry, biology, anatomy and physiology, and basic organic and biochemistry, as well as in basic electrical and mechanical engineering, the students in the Biomedical Engineering major are required to take the core courses, namely, Biomedical Electronics and Instrumentation, Signals and Systems for Biomedical Engineering, Biomechanics, Biomaterials & Tissue Engineering, Biostatistics, Engineering in Biomedicine, and BME Senior Design I & II. Three Biomedical Engineering elective courses are required for this program. The Biomedical Engineering electives include courses such as: Medical Devices and Systems, Medical Imaging and Optics, Medical Informatics and Telemedicine, Artificial Intelligence & Analytics in Healthcare and Medical Robotics & Assistive Technologies. In addition, students may choose a suitable engineering elective course either within or outside of the Biomedical Engineering discipline for their Engineering Elective. It is recommended that students discuss with their faculty advisor prior to registering for courses.

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<td>ENGINEERING PHYSICS I</td>
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| Junior Year |
| Fall Semester |
| CHEM2000  | BASICS OF ORGANIC & BIOCHEMISTRY                     | 4       |
| MATH2750  | DIFFERENTIAL EQUATIONS & SYSTEMS MODELING            | 4       |
| Biomedical Engineering Elective |                                       | 4       |
| HSS Elective |                                                 | 4       |
| Credits   |                                                      | 16      |
| Spring Semester |
| COOP3500  | COOP EDUCATION 1                                     | 0       |
| Credits   |                                                      | 0       |
| Summer Semester |
| MECH3599  | ENGINEERING MECHANICS                                | 4       |
| Biomedical Engineering Elective |                                       | 4       |
| Engineering Elective |                                         | 4       |
| HSS Elective |                                                 | 4       |
| Credits   |                                                      | 16      |
| Senior Year |
| Fall Semester |
| COOP4500  | COOP EDUCATION 2                                     | 0       |
| Credits   |                                                      | 0       |
| Spring Semester |
| BMED5000  | BIOMEDICAL ENGINEERING SENIOR DESIGN I               | 3       |
| BMED4300  | SIGNALS AND SYSTEMS FOR BIOMEDICAL ENGINEERING       | 3       |
| BMED4400  | BIOMECHANICS                                        | 4       |
| BMED4200  | BIOMATERIALS & TISSUE ENGINEERING                    | 3       |
| HSS Elective |                                                 | 4       |
| Credits   |                                                      | 17      |
| Summer Semester |
| BMED5500  | BIOMEDICAL ENGINEERING SENIOR DESIGN II              | 3       |
| BMED4600  | BIOSTATISTICS                                        | 4       |
| BMED4500  | ENGINEERING IN BIOMEDICINE                           | 1       |
| Biomedical Engineering Elective |                                         | 4       |
Course Title Credits
HSS Elective 4

Credits 16

Total Credits 136

ENGL/HSS Note
Day program students are required to complete:

• At least one course in Humanities
• At least one course in the Social Sciences
• The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Civil Engineering Department
The Department of Civil Engineering is home to Wentworth’s ABET-accredited Bachelor of Science in Civil Engineering degree and the Master of Engineering in Civil Engineering degree. The department also offers a minor in Civil Engineering to non-civil engineering majors, and minors in Environmental Engineering and Surveying to civil engineers and other qualified students. Civil engineering students in the Bachelor of Science program may also concentrate their civil engineering elective courses in the areas of geotechnical engineering, structural engineering, transportation engineering or site development/project management.

Civil Engineers are entrusted by society to create a sustainable future and enhance the quality of life for individuals and communities as planners, designers, contractors, and operators of one of society’s economic and social engines—the built environment. They serve as stewards of the natural environment and its resources, as innovators and integrators of ideas and technology across public and private sectors, and as leaders in discussions and decisions shaping public, environmental, and infrastructure policy.

Vision
To build a better world.

Mission
To provide students with the necessary civil engineering, teamwork and communication skills to have career success designing and building safe, sustainable, effective, and efficient systems and infrastructure for the built environment and to protect natural resources for future generations.

Department Chair
• John W. Duggan, Ph.D., P.E.

Professor
• John W. Duggan, Ph.D., P.E.
• James R. Lambrechts, M.S.C.E., P.E.

Associate Professor
• Leonard Anderson, Ph.D.
• Gautham P Das, Ph.D.
• Anuja Kamat, Ph.D.

Assistant Professor
• Tugba Arsava, Ph.D.
• Abigail Charest, Ph.D., P.E.
• Hajar Jafferji, Ph.D.
• Hadi Kazemiroodsari, Ph.D.

Civil Engineering Bachelor of Science
Leading to the Bachelor of Science Degree in Civil Engineering

The Bachelor of Science in Civil Engineering program is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).

Program Description
The Civil Engineering program offers a rigorous curriculum designed to prepare students to enter this dynamic profession, pursue advanced studies, and become a licensed professional civil engineer.

Program Educational Objectives
After graduation, civil engineering graduates should demonstrate the following abilities:

• Lifelong Learning—to pursue professional development by obtaining professional licensure, certifications or by post-graduate study as appropriate to meet and adapt to emerging and evolving technology and infrastructure challenges.
• Successful Careers—to have a successful career in the field of civil engineering or a related field.
• Professionalism—to contribute to the field of civil engineering or a related field as a professional.

Student Outcomes
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
4. An ability to communicate effectively with a range of audiences.
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
6. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.
7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

Total credits for degree: 136
## Freshman Year
### Fall Semester
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## Sophomore Year
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<td>SOIL MECHANICS</td>
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<td>MGMT3200</td>
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### Summer Semester
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### Total Credits
- **136**

## ENGL/HSS Note
Day program students are required to complete:
- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the five humanities and social science electives, BSCE students must include the following **HSS Directed Electives**:

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>ECON4102</td>
<td>PRINCIPLES OF ECONOMICS</td>
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<tr>
<td>HUMN4355</td>
<td>BOSTON VOYAGES BY BOOK &amp; FOOT</td>
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## Civil Engineering Electives

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<tr>
<td>CIVE3150</td>
<td>ADVANCED SURVEYING</td>
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<tr>
<td>CIVE3250</td>
<td>GIS APPLICATIONS IN CIVIL ENGINEERING</td>
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<tr>
<td>CIVE3350</td>
<td>GREEN ENGINEERING</td>
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<tr>
<td>CIVE3450</td>
<td>LEGAL ASPECTS OF BOUNDARY SURVEYING</td>
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<td>CIVE4050</td>
<td>BOUNDARY SURVEYING</td>
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<tr>
<td>CIVE4100</td>
<td>WATER RESOURCES AND HYDROLOGY</td>
<td>3</td>
</tr>
<tr>
<td>CIVE4225</td>
<td>ENVIRONMENTAL UNIT OPERATIONS</td>
<td>3</td>
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<tr>
<td>CIVE4250</td>
<td>STRUCTURAL STEEL DESIGN</td>
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<td>CIVE4300</td>
<td>FOUNDATION ENGINEERING</td>
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<tr>
<td>CIVE4350</td>
<td>REINFORCED CONCRETE DESIGN</td>
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</tbody>
</table>
To meet the 12 Civil Engineering elective requirements, a student may take a combination of Civil Engineering electives, Master of Engineering in Civil Engineering courses and EPIC courses. With approval from the chair of Civil Engineering, Civil Engineering electives may be substituted with an engineering course from another program, another engineering course from an engineering program other than Wentworth or other relevant coursework.

### Civil Engineering Master of Engineering

#### Leading to a Master of Engineering in Civil Engineering Degree

The Master of Engineering in Civil Engineering (M.Eng.CE.) program is designed to educate technical professionals in post-graduate civil engineering principles. The program is designed for part-time students, provides maximum flexibility relative to academic delivery and format, and can be completed in less than two (2) years. The curriculum is organized into two (2) areas of specialization, construction engineering and infrastructure engineering.

#### Construction Specialization

Designed to provide the student with coursework in the construction area of civil engineering, including topics specified in the Civil-Construction PE exam: estimating and scheduling, construction operations, and relevant geotechnical, structural and environmental aspects of construction.

#### Infrastructure Specialization

Designed to provide the student with coursework focused on the design of major infrastructure projects. This curriculum emphasizes transportation and public works infrastructure projects and includes advanced transportation, structural, geotechnical, and environmental coursework.

### Mission

The Master of Engineering in Civil Engineering (M.Eng.CE.) program is designed to meet the criteria outlined by the American Society of Civil Engineers (ASCE) regarding post baccalaureate education in addressing current and future local, national, and global needs. The curriculum of the program has been developed to ensure the alignment of learning objectives with the skills, competencies, and attributes which industry and prospective employers are looking for in our graduates.

### Program Goals

The Master of Engineering in Civil Engineering (M.Eng.CE.) program places emphasis on addressing real-world engineering problems as a practicing professional engineer, while addressing the American Society of Civil Engineers (ASCE) recommended body of knowledge for future civil engineers. Per the recommendation of the ASCE ([www.asce.org](https://www.asce.org)) and as required by state by state regulations, civil engineering graduates and practitioners are strongly encouraged to become licensed engineers, which allows engineers to take personal responsibility for the work they perform for public and private clients.

### Student Learning Outcomes

Graduates of the Master of Engineering in Civil Engineering (MEng CE) program will be able to:

- Demonstrate competence in computer simulation in civil engineering.
- Demonstrate competence in sustainable engineering design.
- Identify, evaluate, and apply project management tools and techniques to engineering issues as they pertain to intra-disciplinary and inter-disciplinary teams.
- Research, analyze and communicate information related to advanced topics and designs.
- Demonstrate the knowledge, tools and techniques associated with advanced topics and designs.

### M.Eng. CE. Courses and Areas of Specialization

The Master of Engineering in Civil Engineering (M.Eng. CE.) program contains three (3) required courses that are common to each area of specialization, Project Management Principles and Practices, Engineering Modeling and Analysis Methods and Environmental Systems. To complete the thirty (30) credit graduate program students are required to take four (4) courses in their area of M.Eng. CE. specialization and two (2) other relevant graduate courses. The culminating experience of the M.Eng. CE. program is a final capstone design course.

#### Required Courses

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<thead>
<tr>
<th>Course</th>
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<tr>
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<tr>
<td>CIVE8100</td>
<td>ENGINEERING MODELING &amp; ANALYSIS</td>
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<td>CIVE8200</td>
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<td>CIVE8950</td>
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#### Construction Area of Specialization

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<tbody>
<tr>
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<tr>
<td>CIVE8350</td>
<td>CONSTRUCTION OPERATIONS, METHODS &amp; QUALITY CONTROL</td>
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<td>CIVE8450</td>
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<td>CIVE8550</td>
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#### Infrastructure Area of Specialization

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<td>HIGHWAY DESIGN &amp; TRANSPORTATION PLANNING</td>
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<td>CIVE8500</td>
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<tr>
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### Degree Details

Total credits for degree: 30

MEng CE students may select courses with the approval of the Department Chair, graduate courses from Wentworth's Master of Science in Construction Management (MSCM) and Master of Science in Facility Management (MSFM) graduate programs, specifically;

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### Construction Specialization

All courses are three (3) credits unless otherwise noted

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<td>CIVE8600 ADVANCED STEEL &amp; CONCRETE DESIGN</td>
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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year One</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester One</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIVE8000</td>
<td>PROJECT MANAGEMENT PRINCIPLES &amp; PRACTICES</td>
<td>3</td>
</tr>
</tbody>
</table>

1 Subject to availability.

### Infrastructure Specialization

All courses are three (3) credits unless otherwise noted

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year One</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester One</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIVE8000</td>
<td>PROJECT MANAGEMENT PRINCIPLES &amp; PRACTICES</td>
<td>3</td>
</tr>
</tbody>
</table>
### Civil Engineering Minor

The Minor in Civil Engineering encompasses three objectives:

- Provide a meaningful experience in civil engineering, including advanced undergraduate courses, to students outside of the Civil Engineering major
- Allow students in other majors to explore and analyze topics in the built environment that civil engineering encompasses
- Enhance the learning experience of all students, including Civil Engineering majors, by having students from multiple majors in civil engineering courses, facilitating the interdisciplinary project work

To complete the minor, students must take five civil engineering courses. Students must complete all prerequisites (or be registered for any corequisites) required for the courses. Available courses include but are not limited to:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVE2205</td>
<td>INTRODUCTION TO GEOMATICS</td>
<td>4</td>
</tr>
<tr>
<td>CIVE2400</td>
<td>CIVIL ENGINEERING MATERIALS</td>
<td>3</td>
</tr>
</tbody>
</table>

Other courses from the Civil Engineering program may be used to complete minor requirements with approval from the Civil Engineering Department.

### Environmental Engineering Minor

The Environmental Engineering minor creates a new professional opportunity for engineering students. The minor is designed for engineering students who would like to expand their area of expertise by incorporation of the appraisal of human activity impacts on the environment, minimization and mitigation of such impact and the tending to the natural environment as the earth’s life support system.

To complete the minor, students must take four civil engineering courses. Students must complete all prerequisites (or be registered for any corequisites) required for the courses. Available courses include but are not limited to:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVE3350</td>
<td>GREEN ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>CIVE4100</td>
<td>WATER RESOURCES AND HYDROLOGY</td>
<td>3</td>
</tr>
<tr>
<td>CIVE4225</td>
<td>ENVIRONMENTAL UNIT OPERATIONS</td>
<td>3</td>
</tr>
<tr>
<td>CIVE4375</td>
<td>WATER AND WASTEWATER TREATMENT</td>
<td>3</td>
</tr>
</tbody>
</table>

Other courses from the Civil Engineering program may be used to complete minor requirements with approval from the Civil Engineering Department.

### Surveying Minor

To complete the minor, students must take four civil engineering courses. Students must complete all prerequisites (or be registered for any corequisites) required for the courses. Available courses include but are not limited to:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVE2205</td>
<td>INTRODUCTION TO GEOMATICS</td>
<td>4</td>
</tr>
</tbody>
</table>
### Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CIVE3150</td>
<td>ADVANCED SURVEYING</td>
<td>4</td>
</tr>
<tr>
<td>CIVE3250</td>
<td>GIS APPLICATIONS IN CIVIL ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>CIVE3450</td>
<td>LEGAL ASPECTS OF BOUNDARY SURVEYING</td>
<td>3</td>
</tr>
<tr>
<td>CIVE4050</td>
<td>BOUNDARY SURVEYING</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td>13</td>
</tr>
</tbody>
</table>

### Computer Science & Networking Department

#### Vision

Our graduates will solve challenging problems facing society, adapt to changing technologies, promote diversity and inclusivity, and be responsible and enlightened citizens of today’s interconnected world.

#### Mission

The Department of Computer Science and Networking prepares graduates for productive and impactful careers in computing through experiential learning and co-operative educational experiences.

#### Department Overview

The Department of Computer Science and Networking is dedicated to providing its students with a foundation for continuous learning and an understanding of contemporary computer science, computer networking, and cybersecurity applications and concepts. The department introduces students to this field by using introductory programming, networking, and security coursework. Students develop the necessary skills to acquire and apply new knowledge in courses such as data structures, algorithms, databases, programming languages, operating systems, routing, security, and system administration. The department strives to prepare its graduates for productive and challenging careers in private practice, industry, and government, and to provide a solid foundation for lifelong professional development, including graduate programs.

Students in the department learn through hands-on activities, practical labs, and long-term projects. The department’s dedicated networking laboratory provides students with an innovative learning environment. Students have the opportunity to work with state-of-the-art servers, switches, and routers both for network design and administration. The department also involves students in their professions through its support of related student organizations and co-operative educational experiences.

#### Department Chair

- Charles Wiseman, Ph.D.

#### Professor

- Leonidis Deligiannidis, Ph.D.
- Hongsheng Wu, Ph.D.

#### Associate Professor

- Raymond Hansen, M.S.
- Durga Suresh-Menon, M.S.
- Charles Wiseman, Ph.D.
- Chen-Hsiang Yu, Ph.D.
- Mira Yun, Ph.D.

### Assistant Professor

- Magdy M. Ellabidy, M.S.
- Mehmet Ergezer, Ph.D.
- Salem Othman, Ph.D.
- Cuong Pham, Ph.D.
- Micah Schuster, Ph.D.
- Ming Zhang, Ph.D.

### Computer Networking Bachelor of Science

#### Leading to the Bachelor of Science Degree in Computer Networking

The Bachelor of Science in Computer Networking program is accredited by the Computing Accreditation Commission of ABET (http://www.abet.org).

Students in Computer Networking (BSCN) gain valuable skills in switching and routing, network and computer security, administration, web development, databases, and scripting. Coursework emphasizes practical applications of these skills in designing, configuring, documenting, and maintaining complex systems. Students also apply these skills directly in the work environment through two required co-op work semesters beginning junior year.

#### Program Educational Objectives

Within three to five years of graduation:

- Graduates are proficient at solving computer networking problems in the workplace.
- Graduates pursue productive careers in computer networking or a related computing field.
- Graduates are engaged in continuing professional development or professional societies in computer networking, or a related computing field.
- Graduates follow standards set forth by professional societies of which they are members.

#### Student Outcomes

Graduates of the program will have an ability to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program’s discipline.
Total credits for degree: 128

This is a four-year program, starting in the fall semester of the student’s first year and planned to end in the summer semester of the student’s fourth year. The courses are as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Freshman Year</strong></td>
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<tr>
<td><strong>Fall Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP1000</td>
<td>COMPUTER SCIENCE I</td>
<td>4</td>
</tr>
<tr>
<td>COMP1100</td>
<td>INTRODUCTION TO NETWORKS</td>
<td>4</td>
</tr>
<tr>
<td>English Sequence</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>MATH1500</td>
<td>PRECALCULUS</td>
<td>4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Spring Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP1050</td>
<td>COMPUTER SCIENCE II</td>
<td>4</td>
</tr>
<tr>
<td>COMP1150</td>
<td>ROUTING AND SWITCHING</td>
<td>4</td>
</tr>
<tr>
<td>MATH2300</td>
<td>DISCRETE MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>English Sequence</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Sophomore Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP1200</td>
<td>COMPUTER ORGANIZATION</td>
<td>4</td>
</tr>
<tr>
<td>COMP2500</td>
<td>SECURITY PRINCIPLES</td>
<td>4</td>
</tr>
<tr>
<td>MATH1030</td>
<td>STATISTICS &amp; APPLICATIONS</td>
<td>4</td>
</tr>
<tr>
<td>HSS Elective</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Spring Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP2150</td>
<td>NETWORK ADMINISTRATION</td>
<td>4</td>
</tr>
<tr>
<td>COMP2650</td>
<td>DATABASES</td>
<td>4</td>
</tr>
<tr>
<td>COMP2160</td>
<td>WIRELESS NETWORKS</td>
<td>4</td>
</tr>
<tr>
<td>HSS Elective</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Summer Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COOP3000</td>
<td>PRE CO-OP WORK TERM</td>
<td>0</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>0</strong></td>
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<tr>
<td><strong>Junior Year</strong></td>
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<tr>
<td><strong>Fall Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP3100</td>
<td>SYSTEM ADMINISTRATION</td>
<td>4</td>
</tr>
<tr>
<td>COMP3500</td>
<td>NETWORK SECURITY</td>
<td>4</td>
</tr>
<tr>
<td>NET Elective (p. 106)</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>HSS Elective</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Spring Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COOP3500</td>
<td>COOP EDUCATION 1</td>
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</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>0</strong></td>
</tr>
<tr>
<td><strong>Summer Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP3550</td>
<td>COMPUTER SECURITY</td>
<td>4</td>
</tr>
<tr>
<td>NET Elective (p. 106)</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>MATH1900</td>
<td>INTRODUCTION TO OPERATIONS RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>HSS Elective</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

1 Computer Networking students take a total of five major electives. At least one of these electives must be selected from the Advanced Security Elective list below. The Computer Networking Elective courses to be offered in a particular semester will be selected by the Computer Science and Networking department. Note that some courses are required in other programs. Students may take these courses provided that they have passed the course prerequisites.

2 Computer Networking students are required to take one science elective. The science elective can be a 4-credit course in Biology, Chemistry, or Physics for which the student has the prerequisite courses.

**ENGL/HSS Note**

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the five listed humanities and social science electives, BSCN students must include the following HSS Directed Elective:

- An Ethics elective

**Networking and Security Electives**

The Computer Networking Elective courses may include, but are not limited to:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP2000</td>
<td>DATA STRUCTURES</td>
<td>4</td>
</tr>
<tr>
<td>COMP2350</td>
<td>ALGORITHMS</td>
<td>4</td>
</tr>
</tbody>
</table>
Computer Science Bachelor of Science

Leading to the Bachelor of Science Degree in Computer Science

Bachelor of Science in Computer Science program is accredited by the Computing Accreditation Commission of ABET (http://www.abet.org).

Students in Computer Science (BCOS) gain valuable skills in software design, programming languages, systems, and development in high-level computer languages. Related courses including databases, software engineering, networking, and operating systems are also integral in this program. Elective courses are available in a wide variety of computing areas including web development, mobile development, embedded computing, artificial intelligence, machine learning, and cybersecurity. Students also apply these skills directly in the work environment through two required co-op work semesters beginning junior year.

Program Educational Objectives

Within three to five years of graduation:

- Graduates are proficient in applying computer science principles and best practices to problems in the workplace.
- Graduates attain productive and challenging computer science and/or software engineering careers in private practice, industry, or government.
- Graduates are engaged in continuing professional development or professional societies in computer science or a related computing field.
- Graduates follow standards set forth by professional societies of which they are members.

Student Outcomes

Graduates of the program will have an ability to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

Total credits for degree: 128

This is a four-year program, starting in the fall semester of the student's first year and planned to end in the summer semester of the student's fourth year. The courses are as follows:

### Course Title Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP1000</td>
<td>COMPUTER SCIENCE I</td>
<td>4</td>
</tr>
<tr>
<td>MATH2300</td>
<td>DISCRETE MATHEMATICS</td>
<td>4</td>
</tr>
<tr>
<td>MATH1750 or MATH1775</td>
<td>ENGINEERING CALCULUS I or INTEGRATED ENGINEERING CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>English Sequence</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>COMP1050</td>
<td>COMPUTER SCIENCE II</td>
<td>4</td>
</tr>
<tr>
<td>COMP1200</td>
<td>COMPUTER ORGANIZATION</td>
<td>4</td>
</tr>
<tr>
<td>MATH1850 or MATH1875</td>
<td>ENGINEERING CALCULUS II or INTEGRATED ENGINEERING CALCULUS II</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP3125</td>
<td>DATA SCIENCE FUNDAMENTALS</td>
<td>4</td>
</tr>
<tr>
<td>COMP3200</td>
<td>ASSEMBLY LANGUAGE</td>
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</tr>
<tr>
<td>COMP3350</td>
<td>PROGRAMMING LANGUAGES</td>
<td>4</td>
</tr>
<tr>
<td>COMP3400</td>
<td>OPERATING SYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>COMP3450</td>
<td>PARALLEL COMPUTING AND DISTRIBUTED COMPUTING</td>
<td>4</td>
</tr>
<tr>
<td>COMP3575</td>
<td>SCRIPTING FOR CYBERSECURITY AND FORENSICS</td>
<td>4</td>
</tr>
<tr>
<td>COMP3580</td>
<td>DIGITAL FORENSICS</td>
<td>4</td>
</tr>
<tr>
<td>COMP3590</td>
<td>APPLIED CRYPTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>COMP3660</td>
<td>MOBILE APP DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>COMP3750</td>
<td>INTRODUCTION TO BIOSTATISTICS</td>
<td>4</td>
</tr>
<tr>
<td>COMP3800</td>
<td>SPECIAL TOPICS IN COMPUTER NETWORKING OR COMPUTER SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>COMP4050</td>
<td>MACHINE LEARNING</td>
<td>4</td>
</tr>
<tr>
<td>COMP4150</td>
<td>ADVANCED SYSTEM ADMINISTRATION</td>
<td>4</td>
</tr>
<tr>
<td>COMP4450</td>
<td>SYSTEMS PROGRAMMING</td>
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</tr>
<tr>
<td>COMP4460</td>
<td>COMPILERS</td>
<td>4</td>
</tr>
<tr>
<td>COMP4500</td>
<td>OFFENSIVE SECURITY</td>
<td>4</td>
</tr>
<tr>
<td>COMP4550</td>
<td>INCIDENT RESPONSE &amp; BUSINESS CONTINUITY</td>
<td>4</td>
</tr>
<tr>
<td>COMP4580</td>
<td>NETWORK FORENSICS</td>
<td>4</td>
</tr>
<tr>
<td>COMP4700</td>
<td>ARTIFICIAL INTELLIGENCE</td>
<td>4</td>
</tr>
<tr>
<td>COMP4750</td>
<td>EMBEDDED ARTIFICIAL INTELLIGENCE</td>
<td>4</td>
</tr>
<tr>
<td>COMP4775</td>
<td>ADVANCED PARALLEL COMPUTING</td>
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<tr>
<td>COMP4960</td>
<td>SOFTWARE ENGINEERING</td>
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The Advanced Security Elective courses may include, but are not limited to:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMP3800</td>
<td>SPECIAL TOPICS IN COMPUTER NETWORKING OR COMPUTER SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>COMP3575</td>
<td>SCRIPTING FOR CYBERSECURITY AND FORENSICS</td>
<td>4</td>
</tr>
<tr>
<td>COMP3580</td>
<td>DIGITAL FORENSICS</td>
<td>4</td>
</tr>
<tr>
<td>COMP3590</td>
<td>APPLIED CRYPTOGRAPHY</td>
<td>4</td>
</tr>
<tr>
<td>COMP4500</td>
<td>OFFENSIVE SECURITY</td>
<td>4</td>
</tr>
<tr>
<td>COMP4550</td>
<td>INCIDENT RESPONSE &amp; BUSINESS CONTINUITY</td>
<td>4</td>
</tr>
<tr>
<td>COMP4580</td>
<td>NETWORK FORENSICS</td>
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</table>
### Course Title Credits

#### English Sequence

<table>
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<tr>
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<tbody>
<tr>
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#### Sophomore Year

<table>
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<tr>
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<tbody>
<tr>
<td>Fall</td>
<td>COMP2000 DATA STRUCTURES</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>COMP2100 NETWORK PROGRAMMING</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MATH2860 LINEAR ALGEBRA &amp; MATRIX THEORY</td>
<td>4</td>
</tr>
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<td>HSS Elective</td>
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<table>
<thead>
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<table>
<thead>
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<th>Spring</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>COMP2350 ALGORITHMS</td>
<td>4</td>
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<tr>
<td></td>
<td>COMP2650 DATABASES</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MATH2100 PROBABILITY &amp; STATISTICS FOR ENGINEERS</td>
<td>4</td>
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</table>

<table>
<thead>
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</thead>
</table>

<table>
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<table>
<thead>
<tr>
<th>Summer</th>
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<tbody>
<tr>
<td></td>
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#### Junior Year

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#### Senior Year

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<th>Summer</th>
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<tr>
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<td></td>
<td>MATH or SCIENCE Elective</td>
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<table>
<thead>
<tr>
<th>Credits</th>
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</table>

### Computer Science Electives

The Computer Science Elective courses may include, but are not limited to:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>COMP1150 ROUTING AND SWITCHING</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COMP2150 NETWORK ADMINISTRATION</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COMP2160 WIRELESS NETWORKS</strong></td>
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<td></td>
<td><strong>COMP2500 SECURITY PRINCIPLES</strong></td>
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<tr>
<td></td>
<td><strong>COMP3100 SYSTEM ADMINISTRATION</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COMP3125 DATA SCIENCE FUNDAMENTALS</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COMP3200 ASSEMBLY LANGUAGE</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COMP3500 NETWORK SECURITY</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COMP3550 COMPUTER SECURITY</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COMP3575 SCRIPTING FOR CYBERSECURITY AND FORENSICS</strong></td>
<td><strong>4</strong></td>
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<tr>
<td></td>
<td><strong>COMP3580 DIGITAL FORENSICS</strong></td>
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<tr>
<td></td>
<td><strong>COMP3590 APPLIED CRYPTOGRAPHY</strong></td>
<td><strong>4</strong></td>
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<tr>
<td></td>
<td><strong>COMP3660 MOBILE APP DEVELOPMENT</strong></td>
<td><strong>4</strong></td>
</tr>
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1. Computer Science students take a total of five computer science electives. At least two of these electives must be selected from the Advanced Computer Science Elective list below. The Computer Science Elective courses to be offered in a particular semester will be selected by the Computer Science and Networking department. Note that some courses are required in other programs. Students may take these courses provided that they have passed the course prerequisites.

2. BCOS students must take three math or science electives total. Of these, at least one must be a 3-2-4 science elective with the exception of PHYS1000 COLLEGE PHYSICS I (4 credits), and PHYS1500 COLLEGE PHYSICS II (4 credits). Math electives include any Applied Math minor course.

---

### ENGL/HSS Note

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the five listed humanities and social science electives, BCOS students must include the following **HSS Directed Elective**:

- An Ethics elective

---

### Computer Science Electives

The Computer Science Elective courses may include, but are not limited to:
The Advanced Computer Science Elective courses may include, but are not limited to:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP3200</td>
<td>ASSEMBLY LANGUAGE</td>
<td>4</td>
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<tr>
<td>COMP4450</td>
<td>SYSTEMS PROGRAMMING</td>
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<tr>
<td>COMP4460</td>
<td>COMPILERS</td>
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<tr>
<td>COMP4700</td>
<td>ARTIFICIAL INTELLIGENCE</td>
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<td>COMP4750</td>
<td>EMBEDDED ARTIFICIAL INTELLIGENCE</td>
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<td>COMP4775</td>
<td>ADVANCED PARALLEL COMPUTING</td>
<td>4</td>
</tr>
<tr>
<td>COMP4950</td>
<td>PROJECT MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>COMP5750</td>
<td>EMBEDDED ARTIFICIAL INTELLIGENCE</td>
<td>4</td>
</tr>
<tr>
<td>COMP5775</td>
<td>ADVANCED PARALLEL COMPUTING</td>
<td>4</td>
</tr>
</tbody>
</table>

The Advanced Computer Science Elective courses may include, but are not limited to:

The Cybersecurity Bachelor of Science Leading to the Bachelor of Science Degree in Cybersecurity

Students in Cybersecurity (BSCY) learn how systems, devices, and networks operate and how to identify potential security vulnerabilities in those environments. Students will experience the entire security process from incident response and forensics, to offensive and defensive security, to policy and management. Electives allow students to dive deeper into areas of cybersecurity that they are most interested in. Students also apply these skills directly in the work environment through two required co-op work semesters beginning junior year.

Program Educational Objectives

Within three to five years of graduation:

- Graduates are able to analyze and evaluate systems with respect to maintaining operations in the presence of risks and threats.
- Graduates are able to apply necessary oversight of systems based on legal, compliance, regulatory, or governance requirements.
- Graduates are able to define privacy, trust, confidentiality, and security as it relates to people, personnel, and organizations.

Student Outcomes

Graduates of the program will have an ability to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply security principles and practices to the environment, hardware, software, and human aspects of a system.
7. Analyze and evaluate systems with respect to maintaining operations in the presence of risks and threats.

Total credits for degree: 133-135

This is a four-year program, starting in the fall semester of the student's first year and planned to end in the summer semester of the student's fourth year. The courses are as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
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<tr>
<td>COMP1000</td>
<td>or COMP2100</td>
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<tr>
<td>MATH2300</td>
<td>DISCRETE MATHEMATICS</td>
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<td>English Sequence</td>
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<td>COMPUTER SCIENCE II</td>
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<td>COMP1050</td>
<td>or MATH1750</td>
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<td>MATH1775</td>
<td>or MATH1750</td>
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<td>Sophomore Year Fall Semester</td>
<td>COMPUTER ORGANIZATION or DIGITAL LOGIC</td>
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<td>COMP2000</td>
<td>DATA STRUCTURES</td>
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<td>MGMT2560</td>
<td>CYBERSECURITY LAW AND POLICY</td>
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<tr>
<td>MATH1875</td>
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109
### Course Title Credits

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<td>COMP2350</td>
<td>ALGORITHMS</td>
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<td>LINEAR ALGEBRA &amp; MATRIX THEORY</td>
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<td>COMP3100</td>
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<td>OPERATING SYSTEMS</td>
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<td>NETWORK SECURITY</td>
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<td>MATH or SCIENCE Elective 2</td>
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<td>COMP3550</td>
<td>COMPUTER SECURITY</td>
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<tr>
<td>MATH2100</td>
<td>PROBABILITY &amp; STATISTICS FOR ENGINEERS</td>
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<tr>
<td>CRYPTOGRAPHY Elective 3</td>
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<td>MATH or SCIENCE Elective 2</td>
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<td>HSS Elective 1</td>
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<tr>
<td>COMP4550</td>
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<td>COMP5500</td>
<td>SENIOR PROJECT</td>
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<td>3 or 4</td>
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<tr>
<td>HSS Elective 1</td>
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<td>4</td>
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<tr>
<td></td>
<td><strong>Credits</strong></td>
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</tr>
<tr>
<td></td>
<td><strong>Total Credits</strong></td>
<td><strong>133-135</strong></td>
</tr>
</tbody>
</table>

2. Students must take two math or science electives total. Of these, at least one must be a 3-2-4 science elective with the exception of PHYS1000, and PHYS1500. Math electives include any Applied Math minor course.

3. Cybersecurity students take a total of four computer science electives: two cybersecurity electives, one cryptography elective and one computer science.

### ENGL/HSS Note

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the five listed humanities and social science electives BSCY students must include the following HSS Directed Elective

- An Ethics elective

### Cryptography and Cybersecurity Electives

The Cryptography and Cybersecurity Elective courses may include, but are not limited to:

<table>
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<td>MATH2425</td>
<td>CRYPTOLOGY</td>
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<tr>
<td>Cybersecurity Electives may be 3 or 4 credit courses selected from this list</td>
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<td></td>
</tr>
<tr>
<td>COMP3575</td>
<td>SCRIPTING FOR CYBERSECURITY AND FORENSICS</td>
<td>4</td>
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<tr>
<td>COMP3580</td>
<td>DIGITAL FORENSICS</td>
<td>4</td>
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<td>COMP4580</td>
<td>NETWORK FORENSICS</td>
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<tr>
<td>ELEC4025</td>
<td>HARDWARE SECURITY</td>
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### Applied Computer Science Master of Science

Leading to a Master of Science in Applied Computer Science Degree

Due to curriculum changes, applications for the Master of Science in Applied Computer Science (MSCS) are not being accepted for the current academic year. For questions about the MSCS program, contact Department of Computer Science & Networking Department Chair Charles Wiseman at 617-989-4704 or wisemanc@wit.edu.

The Master of Science in Applied Computer Science (MSCS) program is an online program designed for part-time students and can be completed in under two (2) years. Candidates should be able to demonstrate
competencies in three (3) areas: programming, fundamentals of computer science (including computer organization, operating systems, databases, and data communication), as well as statistics.

Mission
The Master of Science in Applied Computer Science (MSCS) program at Wentworth Institute of Technology is designed to educate professionals in the application of technical computing and management skills required to plan, design, implement, deploy and operate computer-based solutions within an organization.

Program Educational Objectives
The MSCS program will provide graduates with the knowledge and skill sets needed to successfully function in middle and upper level Applied Computer Science positions with a technical focus, including leading teams of professionals. The MSCS will be to link theory and practice to create real world applications and value, create and introduce new software and technology, and apply basic managerial skills to provide leadership to a computing team.

Student Outcomes
Graduates of the Master of Science in Applied Computer Science graduates will:

- Demonstrate and function effectively in a team, engage in the process of modeling, designing, and implementing computer-based systems of varied complexity utilizing multiple technologies.
- Maintain effective communication with stakeholders in a typical software development environment by preparing and delivering effective technical presentations using appropriate technologies writing clear and accurate technical documents.
- Learn new models, techniques, and technologies as they emerge, and appreciate the necessity for continuing professional development.
- Demonstrate an ability to model, analyze and design computing processes and systems.
- Analyze a current significant software technology, articulate its strengths and weaknesses, and specify and promote improvements or extensions to that technology.
- Recognize and analyze social and professional issues and responsibilities faced by computing professionals.

Course Title Credits
Required Courses
COMP7000 FOUNDATIONS OF COMPUTER SCIENCE 3
COMP7050 PROGRAMMING PARADIGMS & SYSTEMS 3
COMP7100 MANAGING SOFTWARE DEVELOPMENT 3
COMP7150 DATA SCIENCE & WEB SERVICES 3
COMP7200 MOBILE APPLICATION DEVELOPMENT 3
COMP7250 ENTERPRISE COMPUTING 3
COMP7300 COMPUTER SECURITY 3
COMP7500 CAPSTONE 3
Computing Electives
Select one of the following: 3
COMP7400 BIG DATA
COMP7425 DATA MINING

Management Electives
Select one of the following: 3
MGMT7100 PROJECT MANAGEMENT APPLICATIONS
MGMT7200 LEADERSHIP
TMGT8000 STRATEGIC TECHNOLOGY FOR BUSINESS MANAGEMENT
TMGT8100 MANAGEMENT OF NEW PRODUCT DEVELOPMENT

Total Credits 30

Total credits for degree: 30

Recommended Schedule
Course Title Credits
Year One
Semester One
COMP7000 FOUNDATIONS OF COMPUTER SCIENCE 3
COMP7050 PROGRAMMING PARADIGMS & SYSTEMS 3
Credits 6
Semester Two
COMP7100 MANAGING SOFTWARE DEVELOPMENT 3
COMP7150 DATA SCIENCE & WEB SERVICES 3
Credits 6
Semester Three
COMP7200 MOBILE APPLICATION DEVELOPMENT 3
COMP7250 ENTERPRISE COMPUTING 3
Credits 6

Year Two
Semester One
COMP Elective 3
MGMT/TMGT Elective 3
Credits 6
Semester Two
COMP Elective 3
COMP7500 CAPSTONE 3
Credits 6
Total Credits 30

Due to curriculum changes, applications for the Master of Science in Applied Computer Science (MSCS) are not being accepted for the current academic year. For questions about the MSCS program, contact Department of Computer Science & Networking Department Chair Charles Wiseman at 617-989-4704 or wisemanc@wit.edu.

Computer Networking Minor
The minor in Computer Networking provides students with an opportunity to learn how the Internet works. Students will gain a solid grounding in the protocols that allow networking devices and systems to communicate. This includes the configuration and management of core networking hardware such as routers and switches as well as end systems such as servers, laptops, and mobile devices. Programming and
scripting also plays an important role in the ongoing management and automation of systems, and students are therefore required to take a single course from that area.

To earn the Minor in Computer Networking, students must complete the courses (20 total credits) as outlined below. All courses are four credits.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP1100</td>
<td>INTRODUCTION TO NETWORKS</td>
<td>4</td>
</tr>
<tr>
<td>COMP1150</td>
<td>ROUTING AND SWITCHING</td>
<td>4</td>
</tr>
<tr>
<td>COMP2150</td>
<td>NETWORK ADMINISTRATION</td>
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</table>

Scripting Courses

Select one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMP1000</td>
<td>COMPUTER SCIENCE I</td>
<td>4</td>
</tr>
<tr>
<td>COMP3100</td>
<td>SYSTEM ADMINISTRATION</td>
<td>4</td>
</tr>
<tr>
<td>COMP4150</td>
<td>ADVANCED SYSTEM ADMINISTRATION</td>
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</tr>
<tr>
<td>ELEC3150</td>
<td>OBJECT ORIENTED PROGRAMMING FOR ENGINEERS</td>
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Advanced Courses

Select one of the following:

<table>
<thead>
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<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMP2160</td>
<td>WIRELESS NETWORKS</td>
<td>4</td>
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<tr>
<td>COMP2500</td>
<td>SECURITY PRINCIPLES</td>
<td>4</td>
</tr>
<tr>
<td>COMP2650</td>
<td>DATABASES</td>
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<td>COMP3100</td>
<td>SYSTEM ADMINISTRATION</td>
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<tr>
<td>COMP3125</td>
<td>DATA SCIENCE FUNDAMENTALS</td>
<td>4</td>
</tr>
<tr>
<td>COMP3575</td>
<td>SCRIPTING FOR CYBERSECURITY AND FORENSICS</td>
<td>4</td>
</tr>
<tr>
<td>COMP3590</td>
<td>APPLIED CRYPTOGRAPHY</td>
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<tr>
<td>COMP3680</td>
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<tr>
<td>COMP4450</td>
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<tr>
<td>COMP4580</td>
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<tr>
<td>COMP4750</td>
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<tr>
<td>COMP4960</td>
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Total Credits

20

Computer Science Minor

The minor in Computer Science provides students with the fundamentals of computer programming and design. Students will become proficient with problem solving and algorithmic thinking.

The minor itself requires 16 total credits; however, to enroll in the minor a student must complete each of the prerequisite courses.

Prerequisite Courses

<table>
<thead>
<tr>
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<tr>
<td>COMP1000</td>
<td>COMPUTER SCIENCE I</td>
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<tr>
<td>or ELEC3150</td>
<td>OBJECT ORIENTED PROGRAMMING FOR ENGINEERS</td>
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<tr>
<td>COMP1050</td>
<td>COMPUTER SCIENCE II</td>
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<td>DISCRETE MATHEMATICS</td>
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Core Requirements

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<tr>
<td>COMP2000</td>
<td>DATA STRUCTURES</td>
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<tr>
<td>COMP2350</td>
<td>ALGORITHMS</td>
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Elective Courses

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<tr>
<td>COMP2100</td>
<td>NETWORK PROGRAMMING</td>
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</tr>
<tr>
<td>COMP2650</td>
<td>DATABASES</td>
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<td>COMP3125</td>
<td>DATA SCIENCE FUNDAMENTALS</td>
<td>4</td>
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<tr>
<td>COMP3660</td>
<td>MOBILE APP DEVELOPMENT</td>
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<tr>
<td>COMP3750</td>
<td>INTRODUCTION TO BIOSTATISTICS</td>
<td>4</td>
</tr>
<tr>
<td>COMP4050</td>
<td>MACHINE LEARNING</td>
<td>4</td>
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Advanced Electives

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<thead>
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<tr>
<td>COMP3350</td>
<td>PROGRAMMING LANGUAGES</td>
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<tr>
<td>COMP3400</td>
<td>OPERATING SYSTEMS</td>
<td>4</td>
</tr>
<tr>
<td>COMP3450</td>
<td>PARALLEL COMPUTING AND DISTRIBUTED COMPUTING</td>
<td>4</td>
</tr>
<tr>
<td>COMP3575</td>
<td>SCRIPTING FOR CYBERSECURITY AND FORENSICS</td>
<td>4</td>
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<td>COMP3580</td>
<td>DIGITAL FORENSICS</td>
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<td>COMP3590</td>
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<td>COMP4580</td>
<td>NETWORK FORENSICS</td>
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</tr>
<tr>
<td>COMP4700</td>
<td>ARTIFICIAL INTELLIGENCE</td>
<td>4</td>
</tr>
<tr>
<td>COMP4750</td>
<td>EMBEDDED ARTIFICIAL INTELLIGENCE</td>
<td>4</td>
</tr>
<tr>
<td>COMP4775</td>
<td>ADVANCED PARALLEL COMPUTING</td>
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<tr>
<td>COMP4960</td>
<td>SOFTWARE ENGINEERING</td>
<td>4</td>
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</tbody>
</table>

Total Credits

16

Data Science Minor

The Data Science minor provides students with the necessary analytical skills to gather and analyze (big) data and introduces principal components of machine learning to infer from processed data and share results in a meaningful way.

To earn the Data Science minor, students must successfully complete 20 credits (5 courses, 4 credits each). To enroll in the minor, students must successfully complete each of the two prerequisite courses.

Course   | Title                                      | Credits |
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>COMP1000</td>
<td>COMPUTER SCIENCE I</td>
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</tr>
<tr>
<td>or ELEC3150</td>
<td>OBJECT ORIENTED PROGRAMMING FOR ENGINEERS</td>
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<tr>
<td>MATH1030</td>
<td>STATISTICS &amp; APPLICATIONS</td>
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<tr>
<td>or MATH2100</td>
<td>PROBABILITY &amp; STATISTICS FOR ENGINEERS</td>
<td>4</td>
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Core Courses

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<td>MATH2860</td>
<td>LINEAR ALGEBRA &amp; MATRIX THEORY</td>
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Elective Courses

Select 3 from the following electives (Required to choose electives from 3 different departments)

Computer Science
### Course Title Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tr>
<td>COMP3750</td>
<td>INTRODUCTION TO BIOSTATISTICS</td>
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<tr>
<td>COMP4050</td>
<td>MACHINE LEARNING</td>
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<td></td>
<td>Applied Mathematics</td>
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</tr>
<tr>
<td>MATH2250</td>
<td>TIME SERIES</td>
<td>4</td>
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<tr>
<td>MATH3700</td>
<td>OPERATIONS RESEARCH</td>
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<tr>
<td>MATH4050</td>
<td>MACHINE LEARNING</td>
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</tr>
<tr>
<td></td>
<td>Applied Science</td>
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<tr>
<td>SCIN2500</td>
<td>SCIENTIFIC COMPUTING</td>
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<td></td>
<td>Humanities &amp; Social Sciences</td>
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<tr>
<td>COMM4305</td>
<td>WEB ANALYTICS &amp; MEDIA RESEARCH</td>
<td>4</td>
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<td></td>
<td>Management</td>
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<tr>
<td>MGMT1500</td>
<td>DECISION ANALYSIS FOR BUSINESS</td>
<td>4</td>
</tr>
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<td>MGMT2000</td>
<td>MANAGEMENT INFORMATION SYSTEMS</td>
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</tr>
<tr>
<td>MGMT2500</td>
<td>SYSTEMS ANALYSIS &amp; DESIGN</td>
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</tr>
<tr>
<td></td>
<td>Total Credits</td>
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</table>

### Electrical and Computer Engineering Department

#### Vision
The department strives to prepare its students for productive and challenging careers, and to provide a solid foundation for lifelong professional development.

#### Mission
The mission of the department is to develop students’ analytical and technical skills to enable them to identify and solve problems for the benefit of society, the environment, and quality of life. The department curricula equip students for successful professional practice in their respective technical disciplines. Through a rigorous balance of theory and practice, our programs aim to cultivate in students the ability to adapt to workplace changes, communicate proficiently, and to work effectively in a team environment.

#### Department Chair
- James McCusker, Ph.D.

#### Professor
- Douglas Dow, Ph.D.
- Ali Khabari, Ph.D.

#### Associate Professor
- Scott Grenquist, Ph.D.
- James McCusker, Ph.D.
- Joseph F. Santacroce, M.S.E.E., P.E.
- Jiahui (Jenny) Song, Ph.D.

### Assistant Professor
- Wayne Bynoe, Ph.D.
- Aaron Carpenter, Ph.D.
- Afsaneh Ghanavati, Ph.D.
- Marisha Rawlins, Ph.D.
- Yugu Yang-Keathley, Ph.D.

### Dean Emeritus
- Fred Driscoll, M.S.

### Computer Engineering Bachelor of Science

#### Leading to the Bachelor of Science Degree in Computer Engineering

The Bachelor of Science in Computer Engineering program is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).

Computer engineering builds on the fundamentals of the electrical engineering and computer science fields. Computer engineers are involved in many hardware and software aspects of computing, from the design of digital circuits to computer networks. They design, build, analyze, and evaluate computer systems. Students in this program take courses in logic design, computer organization and architecture, embedded computer systems, operating systems, computer networks, digital signal processing, software engineering, database systems, circuits, electronics, and engineering design. The curriculum incorporates both theory and practice in a learning environment that emphasizes hands-on experience and teamwork. Our graduates are well prepared for pursuing both an advanced degree and a professional career.

#### Program Educational Objectives
After graduation, program graduates should demonstrate these abilities:

- Lifelong learning—Pursue professional development to meet and adapt to the emerging and evolving technology.
- Successful careers—Embark on a successful career in the field of computer engineering or related fields.
- Professionalism—Graduates will contribute to their fields or professions.

#### Student Outcomes
Students should demonstrate the following abilities upon graduation:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Total credits for degree: 134

This is a four-year program, starting in the fall semester of the student's first year and planned to end in the summer semester of the student's fourth year.

**Special Requirement for Graduation**

In addition to the general graduation requirements of the Institute, specific graduation requirements from the Computer Engineering (BSCO) program with a Bachelor of Science degree include maintaining a minimum cumulative grade point average of 2.0 for all technical courses. The courses used to determine the cumulative grade point average for all BSCO technical courses are courses with ELEC and ENGR prefixes. If another Wentworth course is substituted for one of these listed courses, the substitute course will be calculated into this cumulative grade point average for all technical courses.

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<tr>
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<tr>
<td>ENGR1000</td>
<td>INTRODUCTION TO ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>ENGR1800</td>
<td>PROGRAMMING WITH MATLAB or ENGR1600</td>
<td>1</td>
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<tr>
<td>MATH1750</td>
<td>ENGINEERING CALCULUS I</td>
<td>4</td>
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<tr>
<td>PHYS1250</td>
<td>ENGINEERING PHYSICS I</td>
<td>4</td>
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<tr>
<td>English Sequence</td>
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<tr>
<td><strong>Spring Semester</strong></td>
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<tr>
<td>ENGR1500</td>
<td>INTRODUCTION TO ENGINEERING DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>ENGR1800</td>
<td>PROGRAMMING WITH MATLAB or FUNDAMENTALS OF CAD &amp; CAM</td>
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<td>MATH1850</td>
<td>ENGINEERING CALCULUS II</td>
<td>4</td>
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<td>PHYS1750</td>
<td>ENGINEERING PHYSICS II</td>
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**Summer Semester**

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<td>OBJECT ORIENTED PROGRAMMING FOR ENGINEERS</td>
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<td>ANALOG CIRCUIT DESIGN</td>
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<td>ELEC3725</td>
<td>COMPUTER ARCHITECTURE</td>
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<td>Technical or EPIC Elective</td>
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<td>HSS Elective</td>
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<td>ELEC3200</td>
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<td>ELEC3225</td>
<td>APPLIED PROGRAMMING CONCEPTS</td>
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<td>ELEC3550</td>
<td>COMPUTER NETWORKS FOR ENGINEERS</td>
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<td>ELEC3600</td>
<td>SIGNALS AND SYSTEMS</td>
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<td>Technical or EPIC Elective</td>
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<td>PROBABILITY &amp; STATISTICS FOR ENGINEERS</td>
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<tbody>
<tr>
<td>Day program students are required to complete:</td>
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<tr>
<td>• At least one course in Humanities</td>
<td></td>
</tr>
<tr>
<td>• At least one course in the Social Sciences</td>
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</tr>
<tr>
<td>• The remaining courses from either the Humanities or Social Sciences category.</td>
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</tbody>
</table>
Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

**Electrical Engineering Bachelor of Science**

**Leading to the Bachelor of Science Degree in Electrical Engineering**

The Bachelor of Science in Electrical Engineering program is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).

Electrical engineers study, model, analyze, and design the electrical and electronic systems on which modern society relies. The curriculum includes a solid foundation in mathematics, science, and engineering principles. Students in this program take courses in analog and digital circuit design, electronics, electromagnetics, signal processing, communications, power systems, control systems, embedded computer systems, and engineering design. The curriculum incorporates both theory and practice in a learning environment that emphasizes hands-on experience and teamwork. Our graduates are well prepared for pursuing both an advanced degree and a professional career.

**Program Educational Objectives**

After graduation, program graduates should demonstrate these abilities:

- Lifelong learning—Pursue professional development to meet and adapt to the emerging and evolving technology.
- Successful Careers—Enjoy a successful career in the field of electrical engineering or related fields.
- Professionalism—Graduates will contribute to their fields or professions.

**Student Outcomes**

Students should demonstrate the following abilities upon graduation:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Total credits for degree: 135

This is a four-year program, starting in the fall semester of the student’s first year and planned to end in the summer semester of the student’s fourth year.

**Special Requirement for Graduation**

In addition to the general graduation requirements of the Institute, specific graduation requirements from the Electrical Engineering (BSEE) program with a Bachelor of Science degree include maintaining a minimum cumulative grade point average of 2.0 for all technical courses. The courses used to determine the cumulative grade point average for all BSEE technical courses are courses with ELEC and ENGR prefixes. If another Wentworth course is substituted for one of these listed courses, the substitute course will be calculated into this cumulative grade point average for all technical courses.

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<thead>
<tr>
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<tr>
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<tr>
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<tr>
<td>MATH1750 ENGINEERING CALCULUS I</td>
<td>4</td>
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<td>PHYS1250 ENGINEERING PHYSICS I</td>
<td>4</td>
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<tr>
<td>English Sequence</td>
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<td>ENGR1800 or ENGR1600 PROGRAMMING WITH MATLAB or FUNDAMENTALS OF CAD &amp; CAM</td>
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</tr>
<tr>
<td>MATH1850 ENGINEERING CALCULUS II</td>
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<tr>
<td>PHYS1750 ENGINEERING PHYSICS II</td>
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<td>English Sequence</td>
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<td>CHEM1100 GENERAL CHEMISTRY I</td>
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<td>MATH2500 DIFFERENTIAL EQUATIONS</td>
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<td>HSS Elective</td>
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<table>
<thead>
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<th>Credits</th>
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<td>ELEC2850 MICROCONTROLLERS USING C PROGRAMS</td>
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<td>MATH2025 MULTIVARIABLE CALCULUS</td>
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</thead>
<tbody>
<tr>
<td>COOP3000 PRE CO-OP WORK TERM</td>
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</table>
### 2019-2020 Academic Catalog

#### Electrical Engineering Minor

The minor in electrical engineering provides additional knowledge in the field for non-majors, which will help students integrate electrical engineering into their course of study and allow the student to explore a wider array of careers upon graduation.

To earn the minor, the student must pass the following four courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC2250</td>
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<td>ELEC2275</td>
<td>DIGITAL LOGIC</td>
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<td>ELEC3250</td>
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<tr>
<td><strong>Total Credits</strong></td>
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</table>

### Interdisciplinary Engineering Department

#### Vision

Our students solve global challenges and change lives.

#### Mission

To provide students multidisciplinary analytical and technical engineering skills complemented by non-engineering skills to solve global challenges and practice positive global citizenry. Our programs allow students to custom design their degree, embark on study abroad and diversify their skill sets.

#### Department Chair
- Nakisa Alborz, Ph.D.

#### Associate Professor
- Christopher J. Brigham, Ph.D.

#### Assistant Professor
- Nakisa Alborz, Ph.D.
- Alireza Mahdavi Nejad, Ph.D.
- David Simpson, Ph.D.

### Engineering Bachelor of Science

#### Leading to the Bachelor of Science Degree in Engineering

The Bachelor of Science in Engineering is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).

The Bachelor of Science in Engineering (BSEN) degree program is a four-year innovative curriculum providing students the flexibility to customize their engineering degree. Students are able to integrate an engineering concentration course of study with directed studies (minors) of their choice to broaden their education for their professional and personal goals. Students work with the department chair and/or a full-time faculty mentor to customize their education. Advice shall be provided for both their specialized area of engineering study (concentration) and an area.

---

### Course Title Credits

#### Junior Year

**Fall Semester**
- ELEC3250 ANALOG CIRCUIT DESIGN 4
- ELEC3600 SIGNALS AND SYSTEMS 4
- MECH3599 ENGINEERING MECHANICS 4
- Elective Technical or EPIC 3
- HSS Elective 4
- **Credits** 19

**Spring Semester**
- COOP3500 COOP EDUCATION 1 0
- **Credits** 0

**Summer Semester**
- ELEC3150 OBJECT ORIENTED PROGRAMMING FOR ENGINEERS 4
- ELEC3350 SOLID STATE DEVICES 3
- ELEC4050 MOTORS AND CONTROLS 4
- ELEC4475 FEEDBACK AND CONTROL 4
- Elective Technical or EPIC 3
- **Credits** 18

**Total Credits** 135

#### Senior Year

**Fall Semester**
- COOP4500 COOP EDUCATION 2 0
- **Credits** 0

**Spring Semester**
- ENGR5000 ENGINEERING SENIOR DESIGN I 4
- MGMT3200 ENGINEERING ECONOMY 3
- MATH2100 PROBABILITY & STATISTICS FOR ENGINEERS 4
- HSS Elective 4
- **Credits** 15

**Summer Semester**
- ELEC4300 ENGINEERING COMMUNICATION SYSTEMS 4
- ENGR5500 ENGINEERING SENIOR DESIGN II 4
- ELMC3250 ELECTROMAGNETIC FIELD THEORY 3
- HSS Elective 4
- **Credits** 15

**Total Credits** 135

### ENGL/HSS Note

Day program students are required to complete:
- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.
of directed studies (minor). The BSEN program allows students to
compliment an engineering curriculum with directed study courses to
expand their education beyond a single area of study.

Students in the BSEN program are required to select one area of
engineering concentration at the end of their freshman year from
the following concentrations: Biomedical, Civil, Computer, Electrical,
Mechanical or Manufacturing, as well as a minor/directed studies.
Recommended plans of study are indicated below in the concentration
curriculum sheets for the various engineering concentration tracks.
Students are required to consult with their academic advisors to identify
their concentration track and directed studies path. Students may plan
to study abroad for one semester, ideally during the fall semester of their
junior year.

All concentrations of the BSEN curriculum include the following:

- A set of core engineering concentration courses
- A set of mathematics and science courses that support the
  engineering discipline
- A set of general education courses that provide the foundation to
  understand the role and responsibility of an engineer in society, and in
  a global environment
- A set of directed study courses/minor courses that provide a pathway
  for a student’s future goals. A set of interdisciplinary design courses
  allowing students to collaborate with one another on a variety of
  projects

BSEN curriculum total credit hours for all concentration tracks:

- Engineering Concentration courses: 52 credits
- Mathematics and Basic Science: 32 credits
- General Education: 28 credits
- Directed Studies and other electives: 16 credits
- Business / Management: 6 credits

BSEN Program Mission Statement
The mission of the BSEN engineering program is to prepare students to
become practicing engineers who are entrepreneurs, innovative problem
solvers, engineering managers, system engineers, engineers having
multidisciplinary skills, and engineering design professionals.

Program Educational Objectives
The educational objectives of this program, which describe the
expectations of our graduates a few years after graduation, are as follows:

- Develop creative solutions for the benefit of society while working in
  multidisciplinary engineering teams
- Communicate effectively to present technical information to various
  audiences
- Pursue directed or independent study to advance professionally

Student Outcomes
Upon graduation, BSEN graduates demonstrate the following outcomes:

1. An ability to identify, formulate, and solve complex engineering
   problems by applying principles of engineering, science, and
   mathematics.
2. An ability to apply engineering design to produce solutions that
   meet specified needs with consideration of public health, safety,
   and welfare, as well as global, cultural, social, environmental, and
   economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in
   engineering situations and make informed judgments, which must
   consider the impact of engineering solutions in global, economic,
   environmental, and societal contexts.
5. An ability to function effectively on a team whose members together
   provide leadership, create a collaborative and inclusive environment,
   establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation,
   analyze and interpret data, and use engineering judgment to draw
   conclusions.
7. An ability to acquire and apply new knowledge as needed, using
   appropriate learning strategies.

Career Opportunities
The Bachelor of Science in Engineering (BSEN) is a co-operative
education program that provides students with one of the most important
aspects of a Wentworth education. BSEN students must complete at
least two non-consecutive semesters of full-time co-operative work
experience in industry in fields related to their engineering concentration
and directed study courses. Graduates may continue their studies at the
graduate level or pursue an industrial career. Wentworth BSEN graduates
are multidisciplinary engineers, and as such, are in high demand and well
prepared to meet the professional challenges of a constantly changing
and increasingly global workforce.

Total credits for degree: 134

Wentworth’s Bachelor of Science in Engineering (BSEN) is a 4-year
innovative interdisciplinary degree for students who wish to create a
curriculum integrating their engineering and non-engineering interests in
a structured manner. Study Abroad is also highly encouraged with various
study abroad and co-op abroad options to select from.

BSEN students are required to select a concentration from six possible
engineering areas (1) Biomedical, (2) Civil, (3) Computer, (4) Electrical,
(5) Mechanical, (6) Manufacturing; and directed studies/minors areas
(please check each department for minors offered).

Minor Option
Students may select a minor from a variety of departments through
the College of Engineering and Computer Science, College of Arts and
Sciences, College of Architecture, Design and Construction Management
to fulfill their directed studies requirements.

Directed Studies Option
Students may select electives that match their personal interests and
broaden their career options. The combinations are varied and limited
only by student interests and imagination. Our engineering students
have focused on fields ranging from Sustainability, Life Cycle Analysis,
Business Management, Computer Science, Applied Math and Sciences,
Music, and Art.

Working closely with the Department Chair and/or a full-time
faculty member, students design an engineering education meeting
individualized personal and professional goals.
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<th>Title</th>
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<td>ENGR1500</td>
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<td>MATH1850</td>
<td>ENGINEERING CALCULUS II</td>
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<td>PHYS1750</td>
<td>ENGINEERING PHYSICS II</td>
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<td>English Sequence</td>
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<td>Sophomore Year</td>
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<td>Directed Studies Elective</td>
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<td>COMP Computer Science Elective</td>
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<td>Management Elective</td>
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### ENGL/HSS Note

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- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

### BSEN Program Timeline

<table>
<thead>
<tr>
<th>Action</th>
<th>Year</th>
<th>Term</th>
<th>Next Step</th>
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<tr>
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<td>FALL (BMED)/SPRING</td>
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<tr>
<td>Minor Declaration</td>
<td>Freshman</td>
<td>FALL (BMED)/SPRING</td>
<td>Meet with Advisor/Academic Coordinator</td>
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<tr>
<td>Study Abroad interest</td>
<td>Freshman/Sophomore</td>
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<td>Meet with Advisor/Academic Coordinator</td>
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</tbody>
</table>
Biological Engineering Bachelor of Science

Leading to the Bachelor of Science Degree in Biological Engineering

Program Mission Statement
The mission of the Biological Engineering program is to prepare students to become practicing engineers/scientists, who will go on to be innovative problem solvers in industry, government, and academia.

Program Overview
Biological engineering is at the leading edge of emerging engineering disciplines, applying the engineering principles of analysis, synthesis, and design to biology at the molecular and cellular levels to create new products and processes. By understanding biological functions at the fundamental level, and how systems and processes are structured, new technologies, materials, and systems can be created to improve quality of life through a broad array of sectors from health care to the environment. The Biological Engineering program provides opportunities for students who wish to study engineering, but also want to study biology because it is the fundamental building block of life sciences. This program opens opportunities for students to study science and engineering and apply the principles of each area while working with diverse applications involving living organisms.

Program Educational Objectives
Within three to five years after graduation, graduates of the Biological Engineering program will:

• Contribute significantly in the design and development of complex biological systems.
• Work effectively as members of multidisciplinary teams that analyze data critically, synthesize information and implement ethical solutions for the betterment of society.
• Prepare and present technical and scientific information professionally to various audiences.
• Further their education either through directed or independent studies to advance them personally and professionally.

Student Outcomes
By the time of graduation, students enrolled in the Biological Engineering program will be able to demonstrate the following outcomes:

1. An ability to identify, formulate, and resolve complex engineering problems by applying principles of engineering, science and mathematics.
2. An ability to apply engineering design to produce solutions that meet specific needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
5. An ability function effectively on a team whose members together provide leadership, create collaborative and inclusive environment, and societal contexts.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Total credits for degree: 132

This is a four-year program, starting in the fall of the student’s first year and ending in the summer semester of the student’s fourth year.

Biological Engineering (BSBE)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<td><strong>Spring Semester</strong></td>
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<td>ENGR1600</td>
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<tr>
<td><strong>Sophomore Year</strong></td>
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<td><strong>Spring Semester</strong></td>
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<td>CHEM1600</td>
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Total credits for degree: 132
### Electromechanical Engineering Bachelor of Science

#### Course Title Credits

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<td>UNIT OPERATIONS &amp; PROCESS CONTROL</td>
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</table>

**Total Credits:** 132

### ENGL/HSS Note

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

### Electromechanical Engineering Program Mission Statement

The mission of this interdisciplinary electrical and mechanical program is to prepare students to become practicing engineers who will become innovative problem solvers in robotics, industry, government, and academia.

### Program Educational Objectives

The educational objectives of this program, which describe the expectations of our graduates a few years after graduation, are as follows:

- Contribute significantly in the design and development of complex electromechanical systems
- Work effectively as members of multidisciplinary teams that analyze data critically, synthesize information and implement ethical solutions for the betterment of society
- Prepare and present technical information professionally and effectively to various audiences
- Further their education through directed or independent studies to advance themselves personally and professionally

The Electromechanical Engineering program at Wentworth is committed to both a collaborative teaching model and a committee management structure, thereby providing the students access to many innovative interdisciplinary educational opportunities.

### Student Outcomes

Students should demonstrate these abilities upon graduation:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety,
and welfare, as well as global, cultural, social, environmental, and economic factors.

3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Career Opportunities

Electromechanical Engineering is a co-operative education program that provides students with one of the most important aspects of a Wentworth education. Electromechanical Engineering students will complete at least two non-consecutive semesters of full-time co-operative work experience in industry related to electromechanical engineering. Graduates may continue their studies at the graduate level or pursue an industrial career. Wentworth Electromechanical Engineering graduates are multidisciplinary engineers, with expertise in electrical and mechanical engineering, and as such, are in high demand and well prepared to meet the professional challenges of a constantly changing and increasingly global work force.

Total credits for degree: 174 credits

This is a five-year program, starting in the fall semester of the student’s first year and planned to end in the spring semester of the student’s fifth year.

Electromechanical Engineering (BELM) Curriculum

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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<td><strong>Freshman Year</strong></td>
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<tr>
<td>ENGR1000</td>
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<td>ENGR1800</td>
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<td>MATH1750</td>
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<td>ENGINEERING PHYSICS I</td>
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<td>ELEC2275</td>
<td>DIGITAL LOGIC</td>
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<td>ELEC2750</td>
<td>NETWORK THEORY II</td>
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<td>MECH2000</td>
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<td>ELEC3250</td>
<td>ANALOG CIRCUIT DESIGN</td>
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<td>MECH2250</td>
<td>ENGINEERING THERMODYNAMICS</td>
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<td>MECH2500</td>
<td>MECHANICS OF MATERIALS</td>
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<td>ELEC3920</td>
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<td>ELEC4050</td>
<td>MOTORS AND CONTROLS</td>
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<td>MECH3900</td>
<td>ENGINEERING HEAT TRANSFER</td>
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<td>ELEC4475</td>
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<td>MECH3850</td>
<td>ENGINEERING DYNAMICS</td>
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<td>MECH4400</td>
<td>ENGINEERING THERMAL DESIGN</td>
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Course | Title | Credits
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**HSS Elective** | | 4
**Summer Semester** | | 16
COOP4500 | COOP EDUCATION 2 | 0
**Fifth Year** | | 0
**Fall Semester** | | 4
ELMC5005 | ELECTROMECHANICAL SYSTEMS I | 4
ELMC5000 | SENIOR DESIGN I | 4
ELECTIVE Technical or EPIC | | 3
HSS Elective | | 4
**Spring Semester** | | 15
ELMC5000 | SENIOR DESIGN II | 4
ELMC5050 | ELECTROMECHANICAL SYSTEMS II | 4
MGMT3200 | ENGINEERING ECONOMY | 3
HSS Elective | | 4
**Total Credits** | | 174

ENGL/HSS Note

Day program students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining courses from either the Humanities or Social Sciences category.

Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.

A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

**Mechanical Engineering Department**

**Department Vision and Mission Statement**

The vision of the Department of Mechanical Engineering is to be recognized by industries hiring the department’s graduates as providing an application-driven core curriculum based on the traditions of a Wentworth practice-based education. Through hands-on laboratory-based projects and a cooperative work experience, graduates will be recognized by employers as productive contributors in their respective fields immediately after graduation.

The mission of Wentworth’s engineering programs builds upon Wentworth’s educational mission and curricular model used to assess the effectiveness of the educational programs. Central to Wentworth’s cooperative education is the use of design and project courses throughout the curriculum to assist students in the integration and application of new knowledge into their developing professional practice skills. Wentworth’s engineering programs are intended to educate future engineers at the undergraduate level. Through a practice-oriented education, they will be able to utilize technological advancements, contribute to innovative design solutions in a collaborative environment, and make appropriate decisions for their respective areas of professional responsibility.

**Department Chair**

- Michael E. Jackson, M.Ed.

**Professor**

- Xiaobin Le, Ph.D.
- Gloria Ma, Ph.D.
- Masoud Olia, Ph.D.
- Ilie Talpasanu, Ph.D.
- Mansour Zenouzi, Ph.D.

**Associate Professor**

- Anthony Duva, M.S.
- Haifa El-Sadi, Ph.D.
- Theodore Greene, M.S.
- Michael E. Jackson, M.Ed.
- Richard L. Roberts, M.S.
- Peter S. Rourke, M.S.
- Douglas Sondak, Ph.D.
- Bo Tao, Ph.D.

**Assistant Professor**

- Stephen Chomyzak, M.S.
- David Perkins, M.S.M.E.
- John Voccio, Ph.D.

**Mechanical Engineering Bachelor of Science**

**Leading to the Bachelor of Science Degree in Mechanical Engineering**

The Bachelor of Science in Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET. (http://www.abet.org)

The Mechanical Engineering (BSME) program is a four-year engineering program with an integrated project- and laboratory-based experience that provides a unique approach to applied learning. Grounded in a solid foundation of mathematics, science, and the humanities and social sciences, this program incorporates all the essential elements of a mechanical engineering curriculum. The program additionally integrates practical engineering design into courses throughout its study, extensive use of computers to solve engineering problems (including developing detailed documentation for manufacturing), and a faculty committed to maintaining a curriculum that parallels industrial changes.

BSME students spend a great deal of time working in our state-of-the-art laboratories, using computers and test equipment to verify and develop principles of engineering in diverse areas such as statics, thermodynamics, material science, data acquisition, structural analysis, and machine design.

Mechanical Engineering students complete two semesters of cooperative industrial work experience in fields related to mechanical engineering,
giving Wentworth students an advantage over their peers at graduation. Graduates may continue their studies at the graduate level or pursue an industrial career. Wentworth BSME graduates are practical engineers, with expertise in mechanical engineering, and who are in high demand and well-prepared to meet the professional challenges of a constantly changing and increasingly global workforce.

Program Educational Objectives
The long-term objectives of the program are to ensure graduates succeed in their chosen field by:

• Contributing significantly in the design and development of complex systems within the field of engineering.
• Working effectively as members of multidisciplinary teams that analyze data critically, synthesize information, and implement ethical solutions for the betterment of society.
• Preparing and presenting technical information professionally to various audiences.
• Furthering their education either through directed or independent studies to advance them personally and professionally.

Student Outcomes
As an extension of the Institute's philosophy, the Mechanical Engineering program's mission is to admit qualified high school graduates and prepare them for productive professional careers in mechanical engineering. To fulfill this goal, the program offers students a rigorous, mathematically-based engineering education with a balanced laboratory experience that provides the technical knowledge and problem-solving skills needed for them to grow as intellectually inquisitive individuals, and as critically involved members of our society with a lifelong commitment to continued learning.

Graduates are expected to leave Wentworth with:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The Mechanical Engineering program at Wentworth is committed to a collaborative teaching model supported by its Industrial Program Advisory Committee, which provides students access to many innovative educational opportunities.

Total credits for degree: 136

Special Requirement for Graduation
In addition to the general graduation requirements of the University, specific graduation requirements from the Mechanical Engineering (BSME) program with a Bachelor of Science degree include maintaining a minimum cumulative grade point average of 2.0 for all technical courses. The courses used to determine the cumulative grade point average for all BSME technical courses are courses with ELEC and MECH prefixes. If another Wentworth course is substituted for one of these listed courses, the substitute course will be calculated into this cumulative grade point average for all technical courses.
Aerospace Engineering Minor

The Aerospace Engineering minor develops the engineering-analysis and design skills necessary for creating and understanding aerospace vehicles and their subsystems. The minor includes diverse topics relevant to applications in aerodynamics. Students in this minor will take at least three core aerospace courses.

Required Courses

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<td>ENGINEERING GRAPHICS</td>
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<tr>
<td>MECH2750</td>
<td>ENGINEERING THERMODYNAMICS II</td>
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<tr>
<td>MECH3200</td>
<td>NUMERICAL SIMULATION &amp; CFD</td>
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<tr>
<td>MECH3350</td>
<td>GAS DYNAMICS</td>
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<tr>
<td>MECH3650</td>
<td>AERODYNAMICS</td>
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</table>

Total Credits 19

Manufacturing Minor

Students selecting a minor in Manufacturing are required to take the Fundamentals of Manufacturing Exam administered by the Society of Manufacturing Engineers (SME). The exam covers math, manufacturing processes, manufacturing management, automation, and related subjects. Successfully passing the exam certifies those students as Manufacturing Technologists (CMfgT), and qualifies them to take the certification exam as a Manufacturing Engineer (CMfgE) two years after graduation.

Required Courses

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<tr>
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<td>MANUFACTURING PROCESSES</td>
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<td>MANF2000</td>
<td>COMPUTER AIDED MANUFACTURING</td>
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<td>MANF3000</td>
<td>MANUFACTURING ENGINEERING</td>
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<td>ENGINEERING GRAPHICS</td>
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<tr>
<td>PSYC4552</td>
<td>INDUSTRIAL ORGANIZATION PSYCHOLOGY</td>
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</table>

Total Credits 21
COLLEGE OF PROFESSIONAL AND CONTINUING EDUCATION

College Vision and Mission Statement

By committing to serve the needs of part-time students, alumni, employers, and the community we live in, the College of Professional and Continuing Education (CPCE) is the gateway to lifelong learning. CPCE is recognized as a leader in providing part-time educational opportunities as well as corporate training, and continuing education in management, the build environment, and in STEM fields. The success of our alumni provides abundant testimony to the strength of our educational programs, and our commitment to providing our communities and employers with a talented and prepared workforce. The college will continue to develop new initiatives to serve the needs of changing industries.

Lifelong learning is a tradition at Wentworth Institute of Technology. The College of Professional and Continuing Education (CPCE) is committed to helping students achieve their educational and career goals with part-time evening, weekend, and online courses designed to accommodate their busy lifestyles. In addition to our degree programs, the College works directly with corporations, industry experts, and our community in developing specific educational programs that address the needs of our professional students. Students applying for associate, bachelor’s, master’s degrees, or certificate programs are academically counseled and considered for admission by the College.

Wentworth has a long tradition of offering specialized workforce training and development programs to people in various technical fields. Certificates, training, and seminars provided through CPCE are rigorous and relevant to the industry. Taught by instructors who are active and experienced in their disciplines, these courses provide students with the experience and credentials needed to make them competitive in today’s job market. Several programs offer skills for licensing and certification. Students who have successfully completed a professional certificate program are eligible for transfer credit in specific CPCE degree programs. Please view the CPCE website (http://wit.edu/continuing-ed) or call CPCE at (617) 989-4300 for information on upcoming courses and programs of study.

Associate Degree Programs

Building Construction Management Associate Degree

Leading to the Associate Degree in Building Construction Management

This program provides a solid foundation in the fundamentals of scheduling, surveying, CAD, estimating, programming, codes, and contracts. Graduates leave with a broad perspective on construction, including wood, masonry, concrete and steel, plumbing, electrical, and HVAC systems. Graduates are prepared to work on large commercial projects as well as residential construction. Possible job opportunities include job supervisors, inspectors, estimators, office managers, and field superintendents.

Graduates of this program may enter Wentworth’s bachelor’s degree programs in Building Construction Management or Project Management.

Students who have earned a Massachusetts State Supervisors License are eligible to receive four (4) credits of advanced standing for BLDG1050 CONTRACTS & CODES. Students who have completed Wentworth’s non-credit Construction Certificate are eligible to receive advanced standing for BLDG1100 CONSTRUCTION METHODS and BLDG1500 CONSTRUCTION ESTIMATING.

Total credits for degree: 64

Course | Title | Credits
--- | --- | ---
BLDG1015 | CONSTRUCTION GRAPHICS | 4
BLDG1050 | CONTRACTS & CODES | 4
BLDG1100 | CONSTRUCTION METHODS | 4
BLDG1500 | CONSTRUCTION ESTIMATING | 4
BLDG1900 | BASIC BUILDING SERVICES | 4
BLDG2000 | STRUCTURAL DESIGN I | 4
BLDG3200 | CONSTRUCTION PROJECT SCHEDULING | 4
BLDG3700 | CONSTRUCTION SAFETY & RISK MANAGEMENT | 3
MGMT3050 | LEADERSHIP & MANAGEMENT | 4
MGMT3650 | BUSINESS LAW | 4
SURV1000 | CONSTRUCTION SURVEYING | 4

General Education Requirements

ENGL1050 | ENGLISH COMPOSITION | 3
ENGL2050 | LITERATURE AND COMPOSITION | 3
MATH1005 | COLLEGE MATHEMATICS A | 3
MATH1035 | COLLEGE MATHEMATICS B | 3
MATH1065 | COLLEGE MATHEMATICS C | 3
PHYS1005 | PHYSICS A | 3
Elective | Humanities or Social Science | 3

Total Credits 64

Engineering Technology Associate in Applied Science

Leading to the Associate in Applied Science Degree in Engineering Technology

This program provides students with the opportunity to explore a variety of technology disciplines. With the advice and approval of their assigned academic advisor, students can customize a program of study to meet individual needs and interests in engineering, science, technology and/or management.

Graduates of this program may enter Wentworth’s bachelor degree programs in Building Construction Management, Facilities Management, or Project Management. Admission to other bachelor degree programs would require specific technical electives. Consultation with the student’s assigned academic advisor is essential to degree planning.

Total credits for degree: 60
Bachelor Degree Programs

Building Construction Management Bachelor of Science Degree

Leading to the Bachelor of Science Degree in Building Construction Management

This program emphasizes the business and management aspects of construction, preparing graduates for upper-level management positions and management of large complex projects. It provides the skills necessary to carry out a construction project from conception to completion, which includes maximizing human resource potential and monitoring and controlling, time, cost and quality.

Construction and building design firms have hired graduates of this program. Possible job opportunities include construction managers, project managers, field engineers, estimators, schedulers, and superintendents.

Program Educational Objectives

- The BBM program prepares students for management-level positions in construction and building design firms, as well as for graduate-level coursework, including in Wentworth's Master of Science in Construction Management program.
- Students leave with the skills necessary to carry out a construction project from conception to completion, which includes maximizing human resource potential and monitoring and controlling, time, cost and quality.
- Graduates of this program are prepared to pursue such positions as construction managers, project managers, field engineers, estimators, schedulers, and superintendents.
- According to the Bureau of Labor Statistics, construction managers' median annual salary in Massachusetts was approximately $101,250 in 2012; nationally, the occupation is projected to grow at a faster than average rate of 16% through 2020.

Total credits for degree: 128

Facility Management Bachelor of Science Degree

Leading to the Bachelor of Science Degree in Facility Management

This program offers instruction which reflects the integrated nature of today's built environment and is designed to prepare students for professional careers in facility management for public, private and institutional organizations. Facility Management practice can be regarded as the management of a company's or institution's physical assets. The management of these assets involves long-term, as well
as short-term, planning for physical facilities and real properties that integrates the organization’s strategic business plan and the technical components for that plant.

Facility managers are involved in the short- and long-term planning that coordinates the physical workplace with the people and the work produced by an organization.

**Program Educational Objectives**

- Learn the fundamental principles in business and management together with current technologies necessary for entry level facility planning professional practice
- Practice applying quantitative decision support tools and knowledge of the build environment to reach facilities planning decisions
- Gain understanding in formulation of FM professional teams to deliver quality building services

Total credits for degree: 128

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credits</th>
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<tr>
<td>BLDG1900</td>
<td>BASIC BUILDING SERVICES</td>
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<tr>
<td>BLDG2500</td>
<td>PROJECT ESTIMATING &amp; SCHEDULING</td>
<td>4</td>
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<tr>
<td>COMM3100</td>
<td>PROFESSIONAL COMMUNICATION</td>
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<tr>
<td>CPFM2000</td>
<td>INTRODUCTION TO FACILITY MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>CPFM2300</td>
<td>SPACE PLANNING</td>
<td>3</td>
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<tr>
<td>CPFM2200</td>
<td>PROJECT MANAGEMENT FOR FACILITY MANAGERS</td>
<td>3</td>
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<td>CPFM3300</td>
<td>BUILDING OPERATIONS</td>
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<td>MGMT2700</td>
<td>FINANCIAL ACCOUNTING</td>
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<td>CPFM4100</td>
<td>FACILITY ASSESSMENT &amp; FORECASTING</td>
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<td>ENERGY &amp; SUSTAINABILITY</td>
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<td>CPFM4600</td>
<td>PRINCIPLES OF REAL ESTATE &amp; PROJECT MANAGEMENT</td>
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<td>CAPSTONE IN FACILITY MANAGEMENT</td>
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<tr>
<td>MGMT3000</td>
<td>MANAGING &amp; LEADING ORGANIZATIONS</td>
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<td>MGMT3625</td>
<td>LABOR RELATIONS (CPCE)</td>
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**Project Management Bachelor of Science Degree**

**Leading to the Bachelor of Science Degree in Project Management**

This program aims to produce leaders for business, industry, and government. Students are introduced to contemporary theories of project management, leadership, and teamwork, as well as accounting, computer software systems, marketing, finance, and communication skills. Courses in planning, policy, and practice are geared to running today’s enterprises.

A broad range of companies including computer, electronic, health, and manufacturing firms have hired graduates of this program. Possible job opportunities include project managers, business analysts, project engineers, operations coordinators and field service engineers. The Project Management degree is available in both hybrid and fully online formats.

**Student Outcomes**

- Evaluate critical success factors for projects and programs
- Demonstrate how teams are assigned and formed and describe the stages of team development
- Evaluate factors important to project selection and prioritization within available resource capacity
- Able to comprehend and use basic tools and techniques to plan, organize and manage a project.
- Evaluate and assess the importance of ethics and professionalism in every aspect of the project’s operation
- Interpret the advantages, disadvantages, and issues that are typical of virtual projects

Total credits for degree: 128

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<thead>
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<th>Title</th>
<th>Credits</th>
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<td>INTRODUCTION TO PROJECT MANAGEMENT</td>
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<td>MGMT2100</td>
<td>MANAGEMENT COMMUNICATIONS</td>
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<td>MGMT2200</td>
<td>RESEARCH METHODS IN BUSINESS</td>
<td>4</td>
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<td>MGMT2300</td>
<td>ORGANIZATIONAL BEHAVIOR</td>
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<td>MGMT2600</td>
<td>PROJECT RISK MANAGEMENT</td>
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<td>MGMT2700</td>
<td>FINANCIAL ACCOUNTING</td>
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<td>MGMT2850</td>
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<td>PROJECT PLANNING, SCHEDULING &amp; CONTROL</td>
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<td>FINANCIAL MANAGEMENT</td>
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<td>MGMT3750</td>
<td>PROJECT EVALUATION &amp; PERFORMANCE</td>
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<td>SENIOR PROJECT</td>
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Master Degree Programs

Applied Computer Science Master of Science

Leading to a Master of Science in Applied Computer Science Degree

Due to curriculum changes, applications for the Master of Science in Applied Computer Science (MSCS) are not being accepted for the current academic year. For questions about the MSCS program, contact Department of Computer Science & Networking Department Chair Charles Wiseman at 617-989-4704 or wisemanc@wit.edu.

The Master of Science in Applied Computer Science (MSCS) program is an online program designed for part-time students and can be completed in under two (2) years. Candidates should be able to demonstrate competencies in three (3) areas: programming, fundamentals of computer science (including computer organization, operating systems, databases, and data communication), as well as statistics.

Mission

The Master of Science in Applied Computer Science (MSCS) program at Wentworth Institute of Technology is designed to educate professionals in the application of technical computing and management skills required to plan, design, implement, deploy and operate computer-based solutions within an organization.

Program Educational Objectives

The MSCS program will provide graduates with the knowledge and skill sets needed to successfully function in middle and upper level Applied Computer Science positions with a technical focus, including leading teams of professionals. The MSCS will be to link theory and practice to create real world applications and value, create and introduce new software and technology, and apply basic managerial skills to provide leadership to a computing team.

Student Outcomes

Graduates of the Master of Science in Applied Computer Science graduates will:

- Demonstrate and function effectively in a team, engage in the process of modeling, designing, and implementing computer-based systems of varied complexity utilizing multiple technologies.
- Maintain effective communication with stakeholders in a typical software development environment by preparing and delivering effective technical presentations using appropriate technologies writing clear and accurate technical documents.
- Learn new models, techniques, and technologies as they emerge, and appreciate the necessity for continuing professional development.
- Demonstrate an ability to model, analyze and design computing processes and systems.
- Analyze a current significant software technology, articulate its strengths and weaknesses, and specify and promote improvements or extensions to that technology.
- Recognize and analyze social and professional issues and responsibilities faced by computing professionals.

Course | Title | Credits
--- | --- | ---
MATH1030 | STATISTICS & APPLICATIONS | 4
MATH1035 | COLLEGE MATHEMATICS B | 3
Elective | Humanities | 6
Elective | Natural/Physical Science | 3
Elective | Social Science | 9
Elective | General Education | 8

General Education Electives

| Elective | General Education Electives | 38
| --- | --- | ---

Total Credits | 128

---

Course | Title | Credits
--- | --- | ---
COMP7000 | FOUNDATIONS OF COMPUTER SCIENCE | 3
COMP7050 | PROGRAMMING PARADIGMS & SYSTEMS | 3
COMP7100 | MANAGING SOFTWARE DEVELOPMENT | 3
COMP7150 | DATA SCIENCE & WEB SERVICES | 3
COMP7200 | MOBILE APPLICATION DEVELOPMENT | 3
COMP7250 | ENTERPRISE COMPUTING | 3
COMP7300 | COMPUTER SECURITY | 3
COMP7500 | CAPSTONE | 3

Computing Electives

Select one of the following: 3

COMP7400 | BIG DATA | COMP7425 | DATA MINING | COMP7450 | SOFTWARE ENGINEERING

Management Electives

Select one of the following: 3

MGMT7100 | PROJECT MANAGEMENT APPLICATIONS | MGMT7200 | LEADERSHIP | TMGT8000 | STRATEGIC TECHNOLOGY FOR BUSINESS MANAGEMENT | TMGT8100 | MANAGEMENT OF NEW PRODUCT DEVELOPMENT

Total Credits | 30

Total credits for degree: 30

Recommended Schedule

Course | Title | Credits
--- | --- | ---
Year One | | |
Semester One | | |
COMP7000 | FOUNDATIONS OF COMPUTER SCIENCE | 3
COMP7050 | PROGRAMMING PARADIGMS & SYSTEMS | 3
| Credits | 6
Semester Two | | |
COMP7100 | MANAGING SOFTWARE DEVELOPMENT | 3
COMP7150 | DATA SCIENCE & WEB SERVICES | 3
| Credits | 6
Semester Three | | |
COMP7200 | MOBILE APPLICATION DEVELOPMENT | 3
Civil Engineering Master of Engineering
Leading to a Master of Engineering in Civil Engineering Degree

The Master of Engineering in Civil Engineering (M.Eng.CE.) program is designed to educate technical professionals in post-graduate civil engineering principles. The program is designed for part-time students, provides maximum flexibility relative to academic delivery and format, and can be completed in less than two (2) years. The curriculum is organized into two (2) areas of specialization, construction engineering and infrastructure engineering.

Construction Specialization
Designed to provide the student with coursework in the construction area of civil engineering, including topics specified in the Civil-Construction PE exam: estimating and scheduling, construction operations, and relevant geotechnical, structural and environmental aspects of construction.

Infrastructure Specialization
Designed to provide the student with coursework focused on the design of major infrastructure projects. This curriculum emphasizes transportation and public works infrastructure projects and includes advanced transportation, structural, geotechnical, and environmental coursework.

Mission
The Master of Engineering in Civil Engineering (MEng CE) program is designed to meet the criteria outlined by the American Society of Civil Engineers (ASCE) regarding post baccalaureate education in addressing current and future local, national, and global needs. The curriculum of the program has been developed to ensure the alignment of learning objectives with the skills, competencies, and attributes which industry and prospective employers are looking for in our graduates.

Program Goals
The Master of Engineering in Civil Engineering (MEng CE) program places emphasis on addressing real-world engineering problems as a practicing professional engineer, while addressing the American Society of Civil Engineers (ASCE) recommended body of knowledge for future civil engineers. Per the recommendation of the ASCE (https://www.asce.org) and as required by state by state regulations, civil engineering graduates and practitioners are strongly encouraged to become licensed engineers, which allows engineers to take personal responsibility for the work they perform for public and private clients.

The MEng CE program addresses ASCE’s strategic initiative entitled “Competency – Raise the Bar” through the master’s degree in civil engineering for students seeking professional licensure, which is an important credential in the field of civil engineering. The MEng CE program is designed to meet criteria outlined by ASCE regarding post baccalaureate education by addressing current and future local, national, and global needs and is widely supported by representatives of the private, public and academic sectors of the civil engineering profession.

Student Learning Outcomes
Graduates of the Master of Engineering in Civil Engineering (MEng CE) program will be able to:

- Demonstrate competence in computer simulation in civil engineering.
- Demonstrate competence in sustainable engineering design.
- Identify, evaluate, and apply project management tools and techniques to engineering issues as they pertain to intra-disciplinary and inter-disciplinary teams.
- Research, analyze and communicate information related to advanced topics and designs.
- Demonstrate the knowledge, tools and techniques associated with advanced topics and designs.

M.Eng. CE. Courses and Areas of Specialization
The Master of Engineering in Civil Engineering (M.Eng. CE.) program contains three (3) required courses that are common to each area of specialization; Project Management Principles and Practices, Engineering Modeling and Analysis Methods and Environmental Systems. To complete the thirty (30) credit graduate program students are required to take four (4) courses in their area of M.Eng. CE. specialization and two (2) other relevant graduate courses. The culminating experience of the M.Eng. CE. program is a final capstone design course.

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CIVE8000</td>
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<tr>
<td>CIVE8100</td>
<td>ENGINEERING MODELING &amp; ANALYSIS</td>
<td>3</td>
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<td>CIVE8200</td>
<td>ENVIRONMENTAL SYSTEMS</td>
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<td>CIVE8950</td>
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Construction Area of Specialization

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<tbody>
<tr>
<td>CIVE8250</td>
<td>ENGINEERING ESTIMATING &amp; SCHEDULING</td>
<td>3</td>
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<tr>
<td>CIVE8350</td>
<td>CONSTRUCTION OPERATIONS, METHODS &amp; QUALITY CONTROL</td>
<td>3</td>
</tr>
</tbody>
</table>
Course | Title | Credits
--- | --- | ---
CIVE8450 | TEMPORARY STRUCTURES | 3
CIVE8550 | SITE PLANNING & DEVELOPMENT | 3

**Infrastructure Area of Specialization**

Course | Title | Credits
--- | --- | ---
CIVE8300 | TRAFFIC ANALYSIS & SAFETY | 3
CIVE8400 | HIGHWAY DESIGN & TRANSPORTATION PLANNING | 3
CIVE8500 | GEOTECHNICAL ENGINEERING FOR INFRASTRUCTURE | 3
CIVE8600 | ADVANCED STEEL & CONCRETE DESIGN | 3
CIVE8700 | BRIDGE DESIGN | 3
CIVE8800 | INFRASTRUCTURE RENEWAL | 3

**Degree Details**

Total credits for degree: 30

MEng CE students may select courses with the approval of the Department Chair, graduate courses from Wentworth’s Master of Science in Construction Management (MSCM) and Master of Science in Facility Management (MSFM) graduate programs, specifically:

Course | Title | Credits
--- | --- | ---
CONM7100 | MODERN CONSTRUCTION DELIVERY METHODS | 3
CONM7200 | CONSTRUCTION LAW | 3
CONM7300 | REAL ESTATE DEVELOPMENT | 3
FMGT7200 | ENERGY & SUSTAINABILITY | 3
FMGT7300 | FACILITY OPERATIONS | 3

**Construction Specialization**

All courses are three (3) credits unless otherwise noted

Course | Title | Credits
--- | --- | ---
CIVE8000 | PROJECT MANAGEMENT PRINCIPLES & PRACTICES | 3
CIVE8200 | ENVIRONMENTAL SYSTEMS | 3

Credit total: 6

Course | Title | Credits
--- | --- | ---
CIVE8100 | ENGINEERING MODELING & ANALYSIS | 3
CIVE8250 | ENGINEERING ESTIMATING & SCHEDULING | 3

Credit total: 6

Course | Title | Credits
--- | --- | ---
CIVE8450 | TEMPORARY STRUCTURES | 3

Select one of the following CIVE/CONM/FMGT courses

Course | Title | Credits
--- | --- | ---
CIVE8300 | TRAFFIC ANALYSIS & SAFETY | 3
CIVE8350 | CONSTRUCTION OPERATIONS, METHODS & QUALITY CONTROL | 3
CIVE8400 | HIGHWAY DESIGN & TRANSPORTATION PLANNING | 3
CIVE8500 | GEOTECHNICAL ENGINEERING FOR INFRASTRUCTURE | 3
CIVE8600 | ADVANCED STEEL & CONCRETE DESIGN | 3
CIVE8700 | BRIDGE DESIGN | 3
CIVE8800 | INFRASTRUCTURE RENEWAL | 3
CONM7100 | MODERN CONSTRUCTION DELIVERY METHODS | 3
CONM7200 | CONSTRUCTION LAW | 3
CONM7300 | REAL ESTATE DEVELOPMENT | 3
FMGT7200 | ENERGY & SUSTAINABILITY | 3
FMGT7300 | FACILITY OPERATIONS | 3

Credit total: 6

Course | Title | Credits
--- | --- | ---
CIVE8950 | CAPSTONE | 3

Select one of the following CIVE/CONM/FMGT courses

Course | Title | Credits
--- | --- | ---
CIVE8300 | TRAFFIC ANALYSIS & SAFETY | 3
CIVE8400 | HIGHWAY DESIGN & TRANSPORTATION PLANNING | 3
CIVE8500 | GEOTECHNICAL ENGINEERING FOR INFRASTRUCTURE | 3
CIVE8600 | ADVANCED STEEL & CONCRETE DESIGN | 3
CIVE8700 | BRIDGE DESIGN | 3
CIVE8800 | INFRASTRUCTURE RENEWAL | 3
CONM7100 | MODERN CONSTRUCTION DELIVERY METHODS | 3
CONM7200 | CONSTRUCTION LAW | 3
CONM7300 | REAL ESTATE DEVELOPMENT | 3
FMGT7200 | ENERGY & SUSTAINABILITY | 3
FMGT7300 | FACILITY OPERATIONS | 3

Credit total: 6

Total Credits: 30
Subject to availability.

Infrastructure Specialization

All courses are three (3) credits unless otherwise noted

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<tr>
<td>Year Two</td>
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Total Credits 30

Students may opt to replace a maximum of two courses with any available (3) credit CIVE course and/or any of the following electives:

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<td>CONSTRUCTION LAW</td>
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<td>FMGT7200</td>
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<tr>
<td>FMGT7300</td>
<td>FACILITY OPERATIONS</td>
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Mission

The Master of Science in Construction Management (MSCM) program at Wentworth Institute of Technology is accredited by the American Council for Construction Education (ACCE). The primary goal of ACCE is to promote and improve construction education in colleges and universities. By working together through ACCE, representatives of the total construction community and the public at large, construction educators and constructors establish and maintain standards and criteria for accreditation. ACCE provides guidance to those programs seeking to achieve accredited status, and carry out the accreditation process.

ACCE accreditation serves the interests of:

- Students: by helping them identify institutions and programs that offer quality education in construction education,
- The Construction Industry: by enabling employers to identify persons who have the potential for making lasting contributions to the construction industry and their profession, and
- Owners / Users of Constructed Facilities and the Public at Large: by raising the professional caliber of constructors and thus the quality of the construction for which they assume responsibility.

Specifically, accreditation of a construction education program by ACCE assures:

- Students and prospective employers that the program has met stringent industry standards of content and quality,
- That program graduates have been provided a quality education enabling them to perform a broad range of professional responsibilities, and
- The construction industry and students that the program performs periodic self-evaluations to keep current with emerging technologies and requirements of the construction industry.

Accreditation by ACCE assists an institution and its construction education program in maintaining contact with other programs and practicing construction professionals, and enables the program to:

- Keep current with emerging technologies in the field,
- Increase awareness of current courses, facilities, and services provided by other accredited programs,
- Improve instructional techniques, and
- Access construction industry contacts nationwide.

Program Educational Objectives

To accomplish the mission of the Master of Science in Construction Management program, the following program goals have been developed
in order to prepare students academically for personal and professional success in the built environment. The attainment of goals is evaluated through the program's outcome assessment program.

- Present opportunities to develop meta-cognitive and life-long learning skills for students seeking increasingly complex management responsibilities, new leadership roles and overall career advancement,
- Expose students to subject matter and industry experts and the latest technological and managerial/leadership advancements and their effects on the Construction Industry, and
- Prepare and develop students from related disciplines to advance into the field of Construction Management.

**Student Outcomes**
The operation, academic integrity and improvement of the MSCM program is based on the relationship of MSCM Program Course and Learning Outcomes to the American Council for Construction Educators (ACCE) Required Program Learning Outcomes (PLO). MSCM Course and Student Learning Outcomes (SLO) are mapped to the ten (10) PLOs required by American Council for Construction Educators (ACCE).

1. Critical thinking and creativity – MSCM students analyze and integrate information to conduct critical, reasoned arguments.
2. Problem solving and decision making - MSCM students design, evaluate, and implement strategies using advanced construction management concepts and practices.
3. Effective and professional oral and written communications - MSCM students produce effective and professional communication in written and oral formats
4. Use of information and communication technology - MSCM students put into practice computer systems, productivity tools, software, and other information and communication technology.
5. Principles of leadership in business and management - MSCM students apply practical management decision-making tools and techniques and leadership best practices.
6. Current issues in construction - MSCM students demonstrate knowledge from industry experiences and keep up to date on developments, best practices, as well as tools and techniques in the field.
7. Complex project decision making and associated risk management - MSCM students recognize, weigh, and analyze risks associated with complex construction projects.
8. Professional ethics including application to situations and choices - MSCM students identify ethical dilemmas in construction and apply practical skills to ethical situations.
9. Advanced construction management practices - MSCM students demonstrate knowledge of contemporary construction industry methods and construction management principles and practices.
10. Research methods - MSCM students recognize and conduct valid, data-supported, and appropriate research in construction management.

This is a five-semester program that begins in the fall semester of the student’s first year and is planned to end after the spring semester of their second year. An optional thesis may be taken in the following summer semester.

**Construction Management Electives**
During the MSCM program, students take one elective in the spring semester of the second year from offerings that may include: CONM7250

**MSCM Recommended Schedule**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONM7000</td>
<td>EXECUTIVE MANAGEMENT FOR CONSTRUCTION MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>CONM7100</td>
<td>MODERN CONSTRUCTION DELIVERY METHODS</td>
<td>3</td>
</tr>
<tr>
<td>CONM7200</td>
<td>CONSTRUCTION LAW</td>
<td>3</td>
</tr>
<tr>
<td>CONM7300</td>
<td>REAL ESTATE DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td>CONM7400</td>
<td>ADVANCE PROJECT CONTROLS</td>
<td>3</td>
</tr>
<tr>
<td>CONM8000</td>
<td>CAPSTONE PROJECT IN CONSTRUCTION MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>MGMT7000</td>
<td>BUSINESS RELATIONS &amp; HUMAN RESOURCE MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>MGMT7050</td>
<td>BUSINESS FINANCE &amp; INVESTMENT</td>
<td>3</td>
</tr>
<tr>
<td>MGMT7150</td>
<td>BUSINESS OPERATIONS &amp; PROCESS MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>CONM8900</td>
<td>CONSTRUCTION MANAGEMENT THESIS</td>
<td>3</td>
</tr>
<tr>
<td>CONM7050</td>
<td>RESEARCH METHODOLOGY FOR CONSTRUCTION MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>CONM7250</td>
<td>CONFLICT RESOLUTION &amp; NEGOTIATION FOR CONSTRUCTION MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>CONM7500</td>
<td>INTERNATIONAL CONSTRUCTION</td>
<td>3</td>
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<tr>
<td>MGMT7300</td>
<td>ECONOMICS &amp; INTERNATIONAL BUSINESS</td>
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</table>

**Course Title Credits**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONM7400</td>
<td>ADVANCED PROJECT CONTROLS</td>
<td>3</td>
</tr>
<tr>
<td>MGMT7050</td>
<td>BUSINESS FINANCE &amp; INVESTMENT</td>
<td>3</td>
</tr>
<tr>
<td>CONM7100</td>
<td>MODERN CONSTRUCTION DELIVERY METHODS</td>
<td>3</td>
</tr>
</tbody>
</table>

Total credits for degree: 30 (36 with optional thesis)
Facility Management Master of Science

Leading to a Master of Science in Facility Management Degree

The Master of Science in Facility Management (MSFM) program is designed to educate students in foundational post-graduate management principles and enhanced facility management skills and knowledge. Students will learn the leadership and business skills necessary to respond to the demand to keep their facilities highly efficient and functional. Coursework will also integrate elements of several related disciplines, including: project management, finance, real estate, humans and their working environment, space planning, building operations and maintenance, and quality assessment. Graduates of the MSFM program will be prepared for leadership roles in facility management and related industries.

Mission

A key feature of the program is the opportunity to build strong professional relationships. Our instructors are proven leaders in the field and many of them work full-time in facility management and closely related areas. Our students also work in facility management and related industries, which creates an ideal learning environment in which students learn from both their instructor and their peers. Many of the concepts learned in the classroom can be immediately applied on the job. Facility Management is the holistic management of real property and the infrastructure of an organization with the aim of improving the productivity of its core business. It is the practice of coordinating the physical workplace with the people and work of the organization; it integrates the principles of business administration, project management, architecture and the behavioral and engineering sciences.

Program Educational Objectives

The Master of Science in Facility Management (MSFM) program is designed to combine common general management techniques with current facility management practices and technologies. The curriculum will provide graduates with the tools and managerial decision-making processes related specifically to maintaining and managing the built environment. The MSFM program is designed for working professionals, as an on-campus format (as well as an online format) with convenient evening classes and a cohort format that allows students to complete the degree in less than two years while still being able to work full-time and fulfill their personal responsibilities.

Student Outcomes

Graduates of the Master of Science in Facility Management (MSFM) program will be able to:

- Describe and demonstrate the implementation of management principles relating specifically to maintaining and managing the built environment.
- Formulate effective communication strategies/processes for delivering concepts, financial information, and strategic and tactical information regarding real property, equipment and staffing to all levels of staff in a business organization.
- Demonstrate leadership skills by leading a team from conception through completion and closeout of an assigned project.
- Demonstrate teamwork skills by participating constructively as a team member on an assigned project.
- Develop a facilities technology strategy for a business or other organization that demonstrates knowledge of different technology platforms, workplace management systems and CAFM; and of the larger social, ethical, and legal issues related to information, telecommunications and other supporting technologies.
- Demonstrate knowledge of research tools appropriate for analyzing and developing solutions for facilities management problems.
- Describe what constitutes effective sustainable policy and use that knowledge to develop a corporate sustainable program.
- Create an energy policy for a business or organization that reflects knowledge of how buildings use energy, and of proven methods to reduce energy consumption.
- Formulate and complete a complex project that demonstrates mastery of both the technical and managerial aspects of strategic facility management.

This is a five-semester program, starting in the fall of the student's first year and planned to end in the summer semester of the student's second year. Students may choose to complete an optional thesis during a sixth semester; it is not required for graduation.

Course Title Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>MGMT7150</td>
<td>BUSINESS OPERATIONS &amp; PROCESS MANAGEMENT</td>
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</tr>
<tr>
<td></td>
<td>Semester One</td>
<td></td>
</tr>
<tr>
<td>CONM7200</td>
<td>CONSTRUCTION LAW</td>
<td>3</td>
</tr>
<tr>
<td>CONM7300</td>
<td>REAL ESTATE DEVELOPMENT</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Semester Two</td>
<td></td>
</tr>
<tr>
<td>Construction Management Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CONM8000</td>
<td>CAPSTONE PROJECT IN CONSTRUCTION MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Thesis Option Only</td>
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</tr>
<tr>
<td>CONM8900</td>
<td>CONSTRUCTION MANAGEMENT THESIS</td>
<td>3</td>
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<td>6 credits of CONM8900 required to fulfill Thesis Option</td>
<td>3</td>
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<td>Total Credits</td>
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</table>

Total credits for degree: 30 (36 with optional thesis)
the Masters degree in less than 2 years. The Master of Science in Project Management (MSPM) is designed for working professionals who want to advance their technical skills while learning the most up-to-date and innovative management strategies. In this program, students will gain valuable, hands-on experience in initiating, planning, executing, controlling, and closing a project on time and on budget; using the latest project management software and technology. Our unique mix of courses, including Troubled Projects, ERP and Virtual Project Management, will give you a competitive advantage in today's rapidly changing IT environment and can get you well on the road to becoming a skilled project manager in as little as two years.

Topics covered in the MSPM include:

- Communications strategies
- Technology project management
- Leadership
- Leveraging technical innovation and intellectual property
- Accounting and finance
- New product development and commercialization
- Global operations

**Program Educational Objectives**

- Create, manage and deliver a project plan from inception to completion, including project scope, risk, quality and performance metrics
- Evaluate potential projects and justify the selection of an appropriate project portfolio
- Effectively communicate and ethically manage project teams, including virtual teams, using appropriate project management tools and techniques
- Manage ERP projects and gain efficiencies through business process integration and automation.

**Student Outcomes**

Upon completion, Master of Science in Project Management graduates will be able to:

- Create, manage and deliver a project plan from inception to completion, including project scope, risk, quality and performance metrics
- Evaluate potential projects and justify the selection of an appropriate project portfolio
- Effectively communicate and ethically manage project teams, including virtual teams, using appropriate project management tools and techniques
- Manage ERP projects and gain efficiencies through business process integration and automation

**Required Courses**

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>MGMT7025</td>
<td>PROJECT SCHEDULING &amp; COST PLANNING</td>
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</tr>
<tr>
<td>MGMT7125</td>
<td>RISK MANAGEMENT</td>
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<tr>
<td>MGMT7225</td>
<td>PROJECT TEAM BUILDING &amp; LEADERSHIP</td>
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</tr>
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<td>MGMT7325</td>
<td>AGILE PROJECT MANAGEMENT</td>
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<tr>
<td>MGMT7425</td>
<td>MANAGING TROUBLED PROJECTS</td>
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<tr>
<td>MGMT7450</td>
<td>COMMUNICATION STRATEGIES</td>
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### Course Title Credits
- MGMT7525 GLOBAL & VIRTUAL PROJECT MANAGEMENT 3
- MGMT7625 MANAGING ERP SYSTEMS 3
- MGMT7725 PORTFOLIO & PROGRAM MANAGEMENT 3
- MGMT7825 M.S. PROJECT MANAGEMENT CAPSTONE 3

### Technology Management Master of Science

Leading to a Master of Science Degree in Technology Management

The Master of Science in Technology Management (MSTM) degree is designed to elevate students’ business acumen, strategic thinking, and people skills, all within the context of the issues and challenges specific to the technical world. Graduates of the MSTM program will be equipped with the management skills, expertise, and ethics necessary to be successful within technology-based enterprises.

### Mission

The MSTM program is designed to combine common general management techniques with current technology management practices and technologies. The curriculum will provide graduates with the tools and managerial decision-making processes related specifically to maintaining and managing in a technical environment. The MSTM program will be taught using a combination of technologies and team instruction. It is anticipated that courses will utilize both industry professionals as well as academic experts. The program will provide graduates with a clear understanding of the management skills, expertise and ethics necessary to be successful within the technology-based enterprises. Topics to be covered will include: communication strategies, technology project management, leadership, leveraging technical innovation and intellectual property, accounting and finance, new product development and commercialization, and global operations.

### Program Educational Objectives

Graduates of the Master of Science in Technology Management program will be prepared for a variety of managerial positions in the technical world. The program will be to provide graduates with the knowledge and skill sets needed to function successfully in middle and upper level technology management positions.

### Student Outcomes

Master of Science in Technology Management graduates will:

- Understand the theory and application of advanced business management theories
- Demonstrate an understanding of strategic technology management.
- Demonstrate an understanding of finance and accounting.
- Demonstrate leadership qualities.
- Understand the critical success factors for leading teams and related organizational development issues.
- Understand the relevance of the increasingly international business environment.
- Demonstrate executive level decision-making and critical thinking skills.
- Demonstrate the ability to deal with complex business challenges, and utilize best practices to arrive at solution sets required of mid and senior level technology managers.

### Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MGMT7000</td>
<td>BUSINESS RELATIONS &amp; HUMAN RESOURCE MANAGEMENT</td>
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<tr>
<td>MGMT7050</td>
<td>BUSINESS FINANCE &amp; INVESTMENT</td>
<td>3</td>
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<tr>
<td>MGMT7100</td>
<td>PROJECT MANAGEMENT APPLICATIONS</td>
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<tr>
<td>MGMT7150</td>
<td>BUSINESS OPERATIONS &amp; PROCESS MANAGEMENT</td>
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<tr>
<td>MGMT7200</td>
<td>LEADERSHIP</td>
<td>3</td>
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<tr>
<td>MGMT7350</td>
<td>MARKETING MANAGEMENT</td>
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<tr>
<td>MGMT7450</td>
<td>COMMUNICATION STRATEGIES</td>
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<tr>
<td>TMGT8000</td>
<td>STRATEGIC TECHNOLOGY FOR BUSINESS MANAGEMENT</td>
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<tr>
<td>TMGT8100</td>
<td>MANAGEMENT OF NEW PRODUCT DEVELOPMENT</td>
<td>3</td>
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</table>
Undergraduate Professional Certificates

Facilities Management Professional Certificate

Student Learning Outcomes

Earning a certificate in Facilities Management from Wentworth enables you to:

- Be eligible for 19 credits toward our Bachelor of Science in Facility Management
- Prepare for the Certified Facilities Manager exam, which offers a competitive career advantage

Wentworth's Facilities Management Certificate program is designed for both professionals in the field looking for credentials to prepare for the Certified Facility Manager exam from the International Facilities Management Association (IFMA) and for professionals who are looking to apply and build their experience toward a new, but related career.

Students will learn critical project management, real estate, property development, and financial skills that will enable you to rapidly advance your career in facilities management. Additionally, all the courses transfer into the Bachelor of Science in Facility Management degree when you decide to continue your studies.

The certificate in Facilities Management is awarded upon successful completion of the required six (6) courses. Each course takes only seven weeks to complete and they range from 3-to-4 credits. Throughout the program, you will enjoy access to all of Wentworth's resources and support services, including the library, academic advising, career counseling and technical support. 19 credits transferrable toward the CPCE Bachelor of Science in Facility Management Degree Seven weeks per course.

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BLDG1900</td>
<td>BASIC BUILDING SERVICES</td>
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<tr>
<td>CPFM2000</td>
<td>INTRODUCTION TO FACILITY MANAGEMENT</td>
<td>3</td>
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<tr>
<td>CPFM3200</td>
<td>PROJECT MANAGEMENT FOR FACILITY MANAGERS</td>
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<td>CPFM4100</td>
<td>FACILITY ASSESSMENT &amp; FORECASTING</td>
<td>3</td>
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<tr>
<td>CPFM4200</td>
<td>ENERGY &amp; SUSTAINABILITY</td>
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<tr>
<td>CPFM4600</td>
<td>PRINCIPLES OF REAL ESTATE &amp; PROJECT MANAGEMENT</td>
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</tr>
<tr>
<td>Total Credits</td>
<td></td>
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</tr>
</tbody>
</table>

Land Surveying (PLS) Professional Certificate

This Professional Land Surveying Certificate is intended for professionals currently working in the land surveying field, who are seeking to become a registered Professional Land Surveyor in Massachusetts. Competencies learned will be field measurement, survey calculations, evidence gathering and assessment, boundary determination, publication and presentation of final survey results, and the applicability of emerging technologies.

The PLS program is designed to be completed in one academic year when students complete 2 courses per semester. Students may opt to complete the program over a two-year period.

Students are allowed to transfer in one course in the PLS program.
Professional Land Surveying (PLS)

Year One

Semester One

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<thead>
<tr>
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<tr>
<td>SURV1100</td>
<td>OVERVIEW OF SURVEYING TECHNOLOGY</td>
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<tr>
<td>SURV1200</td>
<td>SURVEYING MEASUREMENT I</td>
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Semester Two

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<tbody>
<tr>
<td>SURV1500</td>
<td>LEGAL ASPECTS OF LAND SURVEYING I</td>
<td>3</td>
</tr>
<tr>
<td>SURV2200</td>
<td>SURVEYING MEASUREMENT II</td>
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Semester Three

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<tbody>
<tr>
<td>SURV2250</td>
<td>MA. REGULATIONS AFFECTING SURVEYING PROFESSIONALS</td>
<td>3</td>
</tr>
<tr>
<td>SURV2500</td>
<td>LEGAL ASPECTS OF LAND SURVEYING II</td>
<td>3</td>
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</table>

Total Credits 20

Project Management Professional Certificate

Student Learning Outcomes

Earning a certificate in construction management from Wentworth enables you to:

- Be eligible for 21 credits toward our Bachelor of Science in Project Management
- Prepare for the Project Management CAPM exam, which offers a competitive career advantage
- Master the fundamentals of handling the variety of resources for project management
- Gain valuable leadership and management skills

The online Project Management Certificate at Wentworth Institute of Technology provides professionals with the career-enhancing skills needed to assume project management and related positions in the private, non-profit, and government sectors. Through this certificate students are exposed to strategic leadership methods, project planning and control techniques, team management skills, and risk control.

Certificate Details

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>MGMT1010</td>
<td>INTRODUCTION TO PROJECT MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MGMT2100</td>
<td>MANAGEMENT COMMUNICATIONS</td>
<td>4</td>
</tr>
<tr>
<td>MGMT2300</td>
<td>ORGANIZATIONAL BEHAVIOR</td>
<td>3</td>
</tr>
<tr>
<td>MGMT2600</td>
<td>PROJECT RISK MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>MGMT3300</td>
<td>PROJECT PLANNING, SCHEDULING &amp; CONTROL</td>
<td>4</td>
</tr>
<tr>
<td>MGMT3750</td>
<td>PROJECT EVALUATION &amp; PERFORMANCE</td>
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</tr>
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</table>

Total Credits 21

Non-Credit (CEU) Certificates

Building Information Modeling (BIM)

Courses must be taken one at a time and in sequence. A certificate will be awarded upon successful completion of the required upon completion of the required two core courses and one of the electives. Students earn 6.3 Continuing Education Units (CEUs) and can transfer up to 4 credits in general electives toward a bachelor degree program.

Construction

Courses are designed to be taken one at a time and in sequence. A certificate will be awarded upon successful completion of the required four courses. Students earn 14 Continuing Education Units (CEUs) and are eligible to receive 8 credits toward the associate degree in Building
Construction. Credit will be granted for the Construction Methods and Construction Estimating undergraduate courses.

**Workforce Training Programs: Non-Credit (CEU) Courses**

**Cisco Certified Network Associate (CCNA)**
Courses must be taken one at a time and in sequence. Students will be prepared to take the Cisco CCENT or Cisco CCNA certification exam. A certificate of completion will be awarded upon successful completion of the required four courses. Students earn 11.2 Continuing Education Units (CEU's).

**Journeyman Electrician**
Courses are designed to be taken one level per semester in 4 semesters.

**Electrician and System Installer Exam Information**
For exam information please call PSI at 800-733-9267 or visit their website [http://www.psiexams.com](http://www.psiexams.com) or visit the State Licensing Board [http://www.mass.gov/ocabr/licensee/dpl-boards/el/forms/examinations](http://www.mass.gov/ocabr/licensee/dpl-boards/el/forms/examinations).

**AutoCAD**
Students earn 4.8 Continuing Education Units (CEUs).

**State Construction Supervisor License Commercial**
Students earn 2.1 Continuing Education Units (CEUs). Once students pass and provide a certified copy of the Massachusetts State Construction Supervisor License, they are eligible to receive four (4) credits of advanced standing towards the associate degree in Building Construction Management for Contracts and Codes.

**Machine Tooling and Set Up**
Courses are designed to be taken one level at a time and in sequence. Students earn 31.5 Continuing Education Units (CEUs).

**Welding**
Courses are designed to be taken one level at a time and in sequence. Students earn 9.0 Continuing Education Units (CEUs) per course. Students are assisted in completing American Welding Society (AWS) certifications. They are also instructed on how to maintain certification every six months. For more information about the certification, please visit their website [http://www.aws.org/certification](http://www.aws.org/certification).
TRUSTEES AND ADMINISTRATION

Institute Administration

President’s Office
• Mark A. Thompson, President
• Amy M. Intille, Vice President for Executive Affairs
• Susan Green, Executive Director for Trustee and Adviser Relations
• Erik Cote, Assistant Vice President for Strategy and Policy
• Courtney L. McKenna, Assistant Vice President for Strategy and Policy
• Michelle R. Davis, Chief Marketing Officer

Provost’s Office
• Richard Hansen, Interim Provost and Vice President of Academic Affairs

Academic Departments
• Nakisa Alborz, Department Chair, Interdisciplinary Engineering
• Ronald R. Bernier, Department Chair, Humanities and Social Sciences
• Leonard Delosh, Department Chair, Business Management
• John Duggan, Department Chair, Civil Engineering
• Amanda Hattaway, Department Chair, Applied Math
• Patrick Hafford, Dean, College of Arts and Sciences and Interim Dean, College of Professional and Continuing Education
• Chuck Hotchkiss, Dean, College of Architecture, Design and Construction Management
• Michael Jackson, Department Chair, Mechanical Engineering
• Ali Khabari, Interim Dean, College of Engineering and Computer Science
• Shankar Krishnan, Department Chair, Biomedical Engineering
• Seunghae Lee, Department Chair, Interior Design
• James McCusker, Interim Department Chair, Electrical and Computer Engineering
• Samuel Montague, Department Chair, Industrial Design
• Mark Mulligan, Department Chair, Architecture
• Franz Rueckert, Department Chair, Sciences
• E. Scott Sumner, Department Chair, Construction Management
• Charles Wiseman, Department Chair, Computer Science and Networking

Administrative Departments
• Keiko Broomhead, Vice President of Enrollment Management
• Bob Burns, Associate Vice President of Physical Facilities
• Carol Estes-Schwartz, Associate Vice President of Institutional Advancement
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Architecture (ARCH)

ARCH0100 SUMMER FAB: THINKING & MAKING
This summer fabrication program bridges and connects thinking of architecture with making architecture. Students experience in a short timeframe all phases of a complete architectural project: from initial design concepts through development and refinement and including realization as a full-scale construction site. By intertwining thinking and making a process of design from beginning to end, we convey understanding, crucial for designers, that making is a form of thinking. Project sites typically will be located in Boston, either campus or community based. Projects, typically conceived as temporary, will generally be small in size, scale or both. They might include, for example, installations (as within a gallery setting), furniture (including near-furniture or furniture-like elements), or site-specific interventions (either outdoors or within existing structures). Prerequisites: High School Summer Program (4 credits) Summer

ARCH1000 STUDIO 01
This foundation studio focuses on techniques of visualization and representation (freehand drawing skills and model making) as they pertain to beginning design. Students develop fundamental design skills through orthographic drawing (plan, section & elevation), perspective drawing, model making and diagramming. (6 credits) fall

ARCH1500 STUDIO 02
This foundation studio studies general concepts of space, form, material and structure by using techniques in architectural representation and visualization, through a series of design problems. Prerequisite: ARCH1000 (6 credits) spring

ARCH2000 STUDIO 03
This studio course explores conceptual design through a series of elemental architectural exercises. Topics pertinent to the student’s concentration are addressed. Prerequisite: ARCH1500 (6 credits) fall

ARCH2100 HISTORY/THEORY 01
This lecture course surveys world architecture, urbanism and landscapes from the ancient world through roughly 1700 CE. Lectures shall discuss architecture as a form of cultural expression and in relation to the artistic, political, religious, scientific, technological, and social developments. (4 credits) fall
ARCH2200 TECHNOLOGY 01
This lecture and workshop-based course focuses on site design skills and concepts, in urban and non-urban environments. The course also includes principles of building siting/orientation and an introduction to passive environmental building strategies. (4 credits) fall

ARCH2222 AXP ARCHITECTURE EXPERIENCE PROGRAM
Students entering into the first semester of the junior year are required to register for the Intern Development Program (IDP) of the National Council of Architectural Registration Boards (NCARB) and establish an NCARB file number before the end of the semester. Prerequisite: enrollment in BSA program (0 credits)

ARCH2225 PRO-PRACTICE PREP
Through independent learning, this roughly ten-hour course introduces a systematic approach to architectural contract drawing (CDs), architects' drawings to communicate design intent clearly. "Picking up redline" marks - refining CDs reiteratively - is a most common assignment for entry-level staff. Materials in this course provide basic vocabulary and technical logic in the organization of a set of drawings that includes: 1) many scales (from the site plan to the detail drawing) and; 2) many disciplines (the building engineering disciplines - structural and MEP design - as well as other such as landscape architecture). Materials provide two different types of resources: readings and quizzes about the contract drawing set, and drawing a project using the software Revit. (0 credits) fall

ARCH2500 STUDIO 04
This studio course explores architectural design through a series of problems increasing in scale, complexity and length throughout the semester. Prerequisites: ARCH2000 and ARCH2200 (6 credits) summer

ARCH2600 HISTORY/THEORY 02
This lecture course surveys world architecture, urbanism and landscapes from 1700 CE to the 1960's. Lectures discuss architecture as a form of cultural expression and in relation to artistic, political, religious, scientific, technological and social developments. (4 credits) summer

ARCH2700 TECHNOLOGY 02
This lecture and workshop-based course focuses on architectural methods for achieving visual, thermal and acoustical comfort in buildings using climate, form, orientation, materials and structure. Prerequisite: ARCH2200 (4 credits) fall

ARCH3000 STUDIO 05
This studio course explores architectural design through a series of problems increasing in scale, complexity and length throughout the semester. Prerequisite: ARCH2500 (6 credits) fall

ARCH3200 TECHNOLOGY 03
This lecture and workshop-based course focuses on architectural methods for achieving visual, thermal and acoustical comfort in buildings using passive and active systems. Building system technologies are addressed. Prerequisite: ARCH2700 (4 credit) fall

ARCH3400 STRUCTURES I
Students learn how loads are applied and distributed, and how to analyze beams and trusses. Both the method of joints and the method of sections will be used. Basic principles of strength of materials, structural mechanics and structural analysis are presented. Prerequisite: ARCH2000 (3 credits) fall

ARCH3500 STUDIO 06
This studio course explores architectural design through a series of problems increasing in scale, complexity and length throughout the semester. Prerequisite: ARCH3000, ARCH3200 and ARCH3400; Corequisite: ARCH3900 (6 credits) spring

ARCH3700 CONCENTRATION STUDIES 01
This course addresses introductory topics to the students' chosen concentration (Adaptive Interventions, Emerging Technologies, or Urbanism). Contemporary issues in the field are addressed through readings, discussions, analysis, writing and projects. (4 credits) fall

ARCH3750 CONCENTRATION STUDIES 02
This course addresses advanced topics pertinent to the students' chosen concentration (Adaptive Interventions, Emerging Technologies, or Urbanism). Contemporary issues in the field are addressed through readings, discussion, analysis, writing and projects. (4 credits) fall

ARCH3800 SPECIAL TOPICS IN ARCHITECTURE
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (4 credits) fall, spring

ARCH3850 SPECIAL TOPICS IN ARCHITECTURE
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (4 credits) fall, spring

ARCH3900 STRUCTURES II
Students analyze more complex systems and design beams and columns in wood, steel, and concrete. Topics include analysis of continuous beams and rigid frames, loads on structural systems, grids & pattern layout and funicular structures (cables and arches). Prerequisite: ARCH3400 (3 credits) spring

ARCH4000 STUDIO 07 (URBANISM)
This studio course introduces topics of design in the urban realm. Students engage with complex issues and agendas, and develop proposals in response to the physical, cultural, and social contexts that inform design at the urban scale. Topics pertinent to the Urbanism concentration are addressed. Prerequisites: ARCH3500; and Urbanism concentration status (6 credits) fall

ARCH4025 STUDIO 07 (EMERGING TECHNOLOGY)
This studio course introduces topics of design in the urban realm. Students engage with complex issues and agendas, and develop proposals in response to the physical, cultural, and social contexts that inform design at the urban scale. Topics pertinent to the Emerging Technologies concentration are addressed. Prerequisites: ARCH3500; junior status in B.S.Arch, and Emerging Technologies concentration status (6 credits) fall

ARCH4050 STUDIO 07 (ADAPTIVE INTERVENTIONS)
This studio course introduces topics of design in the urban realm. Students engage with complex issues and agendas, and develop proposals in response to the physical, cultural, and social contexts that inform design at the urban scale. Topics pertinent to the Adaptive Interventions concentration are addressed. Prerequisites: ARCH3500; junior status in B.S.Arch, and Adaptive Interventions concentration status (6 credits) fall

ARCH5500 STUDIO 08
This studio course proposes design topics grounded in a research agenda that informs the design process. The range and scale of projects vary; students initiate a single original design project. Prerequisites: ARCH4000 or ARCH4025 or ARCH4050 (6 credits) Spring
ARCH7000 GRADUATE FOUNDATION STUDIO 01
This studio addresses graduate level design topics dedicated to students in the two year Master of Architecture program. **Prerequisite:** Enrollment in two year Master of Architecture program; Please refer to the Design Studio Grade Requirement regarding the final grade for this course (6 credits) fall

ARCH7250 GRADUATE HISTORY THEORY LECTURE
This lecture course surveys world architecture, urbanism and landscapes from the ancient world through roughly 1600 CE. Lectures shall discuss architecture as a form of cultural expression and be presented in relation to artistic, political, religious, scientific, technological, and social developments. (4 credits) fall

ARCH7300 TECHNOLOGY I
This lecture and workshop-based course focuses on site design skills and concepts, in urban and non-urban environments. The course also includes principles of building siting/orientation and an introduction to passive environmental building strategies. (4 credits) fall

ARCH7350 2D + 3D MEDIA & PROCESSES
Requirement for incoming 3 year graduate students. The course introduces and applies fundamental manual drawing techniques and logics essential to the development of spatial and critical thinking skill sets and practice as well as digital 2D and 3D translations. (4 credits) fall

ARCH7500 GRADUATE FOUNDATIONS STUDIO 02
This studio focuses on techniques of visualization and representation (freehand drawing skills and model-making) as they pertain to beginning design. Students continue to develop fundamental design skills through orthographic drawing (plan, section and elevation), perspective drawing, model-making and diagramming. Fundamental digital skills are explored. General concepts of space, form, material and structure are investigated by using techniques in architectural representation and visualization in a series of design problems. **Prerequisite:** ARCH7000 (6 credits) spring

ARCH7550 GRADUATE HISTORY THEORY SEMINAR
This seminar builds on core themes and topics introduced in the Graduate History Theory Lecture, surveying world architecture, urbanism and landscapes from roughly 1600 CE to present. Graduate students concentrate on focused research and themes, critical writing and research at the graduate level is emphasized. Required for three year graduate students. **Prerequisite:** ARCH7250; for two year students: previous relevant history theory course work

ARCH7600 TECHNOLOGY 02
Technology 02 introduces the theory and application of climate, energy use and comfort as determinants of architectural form. Emphasis is on architectural methods for climate adaptation using non-mechanical means (climate, shape, orientation, material and structure) for ventilating, cooling, heating and lighting envelope-load dominated buildings. (4 credits) spring

ARCH8000 ADVANCED GRADUATE DESIGN STUDIO 01
This design course focuses on the development of highly detailed design proposals, integrating knowledge of building materials and systems within the framework of well-articulated and advanced design intentions. **Prerequisites:** ARCH7000 and ARCH7300 (6 credits) fall

ARCH8250 ADVANCED TECHNOLOGY & MATERIALS
This lecture and workshop-based course focuses on site and architecture design skills and concepts, in urban and non-urban environments. The course also includes principles of building siting/orientation and an introduction to passive environmental building strategies. Emphasis on materials, formal logics and structural relationships at multiple scales will be investigated. (4 credits) spring

ARCH8300 APPLIED RESEARCH & DESIGN 01
Focus on advanced studies Research & Design methodologies through a series of explorative projects & presentations. Methodologies & Strategies are explored so as to instill a clear understanding of advanced research at the graduate level. (4 credits) fall

ARCH8400 STRUCTURES I
Students learn how loads are applied and distributed, and how to analyze beams and trusses. Both the method of joints and the method of sections will be used. Basic principles of strength of materials, structural mechanics and structural analysis are presented. **Prerequisite:** M.Arch status (3 credits) fall

ARCH8500 ADVANCED GRADUATE DESIGN STUDIO 02
This design course focuses on the development of highly detailed design proposals, integrating knowledge of building materials and systems within the framework of well-articulated and advanced design intentions. **Prerequisite:** ARCH8000 (6 credits) spring

ARCH8650 FABRICATION METHODS
With a focus on making as a means of applied research, graduate students work with both manual + digital fabrication tools, techniques and fabrication methodologies. Design and Applied Research will range in scale and scope from the making of artifacts to prototyping to one to one scale manufacturing. (4 credits) spring

ARCH8700 APPLIED RESEARCH & DESIGN 02
Applied Research & Design 02 focuses on visual methodologies through a series of explorative projects & presentations. Visual research methodologies & strategies are introduced through a series of case studies and precedents. Graduate level criteria & expectation are to be met. **Prerequisite:** ARCH3000 (4 credits) spring

ARCH8750 CONCENTRATION STUDIES
Concentration Studies offers topics pertinent to Urbanism, Emerging Technologies or Adaptive Interventions with an emphasis on relevant models of research within the selected discipline of the concentration. Contemporary issues in the field are addressed through readings, discussions, analysis, writing and projects. **Prerequisite:** ARCH7000 (4 credits) fall; spring

ARCH8800 STRUCTURES 02
Introduction to behavior and analysis of more complex systems and design of beams and columns in wood, steel and concrete. Topics include analysis of continuous beams/rigid frames, loads on structural systems, grids/pattern layout and funicular structures (cables and arches). **Prerequisite:** ARCH8400 (3 credits) spring

ARCH9000 STUDIO 09: SPECIAL TOPICS
This studio addresses design topics relevant to graduate level study. Students integrate the major architectural issues emphasized in the previous studios in a single design project. **Prerequisite:** M.Arch status; **Corequisite:** ARCH9200 and ARCH9300 (6 credits) fall

ARCH9200 THESIS PREPARATION 01
This course examines the theoretical underpinnings and methodologies pertinent to research in architecture. Students come to understand how researchers conduct architectural research, with the goal of preparing their own thesis agendas. **Prerequisite:** M.Arch Status; **Corequisite:** ARCH9300 (4 credits) fall

ARCH9300 THESIS PREPARATION 02
Students prepare the groundwork for their thesis project through research and development of an architectural program, site analysis, and design methods that support an original design project in ARCH9500. **Prerequisite:** M.Arch status; **Corequisite:** ARCH9200 (4 credits) fall
ARCH9500  THESIS STUDIO
Students pursue a final thesis design of a project of their own definition, as developed during the fall semester in ARCH9200 and ARCH9300.
Prerequisite: ARCH9200 & ARCH9300 (6 credits) spring

ARCH9600  PROFESSIONAL PERSPECTIVES
A comprehensive study of architectural practice, including project management, financial planning, organizational structure, scheduling, marketing, legal issues, and the roles and responsibilities of design professionals. Prerequisite: M.Arch status (4 credits)

ARCH9700  ADVANCED TOPICS 01
This course addresses topics relevant to graduate study. Readings, discussion and analytical projects address contemporary issues in the field. Prerequisites: M.Arch status; ARCH9000, ARCH9200, and ARCH9300; Corequisite: ARCH9600 (4 credits)

Biological Engineering (BIOE)

BIOE2000  FUNDAMENTALS OF BIOLOGICAL ENGINEERING
This course introduces students to the fundamental concepts of Biological Engineering. Knowledge of thermodynamics and fluid mechanics is critical for students to solve biological engineering problems. Students will learn about energy, entropy and enthalpy in their various forms in a biological setting. Students will also learn basic fluid statics and dynamics. These topics will be applied in assignments, exams and in the laboratory to solve biomedical and biochemical engineering problems. Case studies are presented to allow student to put together their knowledge gained in these topics to solve problems pertaining to human organ systems like heart, lungs and kidneys. Prerequisites: CHEM1100 and ENGR1800; Corequisite: PHYS1750 (4 credits) fall

BIOE2100  BIOSTATISTICS FOR BIOENGINEERS
This course is intended for Biological Engineering students and introduces statistical models for analyzing data in the life and health sciences. The course examines descriptive statistics, probability, sampling, probability distributions, estimation, hypothesis testing, analysis of variance and other statistics models. Prerequisites: BIOL1100 and MATH1850 (4 credits) spring

BIOE2500  BIOLOGICAL INSTRUMENTATION & MEASUREMENT
Methods of using instrumentation for measurements in biological engineering are investigated in this course. Topics include the scientific method, sensors and physical phenomenon, data acquisition, analysis and statistics, and instruments for biological engineering. The laboratory exercises focus on the sensor interface, data acquisition, and development of software algorithms to analyze the data. Prerequisites: ENGR1800, BIOL1100 and BIOE2000; Corequisite: CHEM1600 (4 credits) spring

BIOE2550  MICROFLUIDS
Introduction to fundamental principles and methods of microfluidics including capillarity, low Reynolds number flows, diffusion, osmosis, electrical fields, flow through porous media, microfabrication and lateral flow assays with an emphasis on global health diagnostic technologies. Fluid dynamics concepts for bulk flows both in physiological systems and in terms of microfluidic tools for exploring transport phenomena of single cells and tissue scale systems will be covered. Prerequisites: BIOE3025 (4 credits) spring

BIOE3025  BIOMATERIALS & TISSUE ENGINEERING
The chemical and mechanical properties of materials for biological systems are investigated. Cell culture, scaffolds and constructs for tissue engineering application are explored. Prerequisites: BIOE2000 and CHEM3550 (4 credits) summer

BIOE3100  METABOLIC ENGINEERING
An engineering approach to microbiology and bio-based products. As bioengineering continues to grow as a discipline, biomanufacturing using "microbial cell factories" continues to pique the interests of the entrepreneur. Commodity compounds, from amino acids to biopolymers, can be manufactured fermentatively. With a growing list of organismal genome sequences available for analysis and manipulation, organisms (mainly microorganisms) will be utilized and subsequently manipulated by the growing number of molecular biology and synthetic biology techniques available. Students will utilize the methods and concepts taught in this course for problem solving in biotechnology, biomanufacturing and the biopharmaceutical fields. This course discusses cellular and organismal metabolic networks and the mathematical and experimental manipulation of those networks. The techniques of synthetic biology and metabolic flux analysis, core concepts in metabolic engineering, are focused on here. Prerequisites: BIOL1000 and BIOE2000 (4 credits)

BIOE3500  GENETICS AND TRANSGENICS
This course provides students with an introduction to the fundamental principles of molecular biotechnology and methodologies used for gene manipulation. The didactic portion of this course will cover topics including recombinant DNA technology and molecular cloning, bioinformatics, genome and protein engineering and transgenic plants and animals. The laboratory portion will introduce students to methods commonly used for gene manipulation studies including: cell culture, DNA isolation, restriction enzymes and mapping, cloning strategies, immunological screening of proteins and other essential techniques. Prerequisites: BIOL2200 (4 credits) fall

BIOE3550  UNIT OPERATIONS & PROCESS CONTROL
This course introduces fundamental design and operation principles of biological engineering systems, including bioreactors, phase transfer, separation and other mass transfer operations. (4 credits) summer

BIOE3650  COMPUTATIONAL BIOLOGY
Introductions to concepts, techniques and programming skills for computational biology, including simulation and game theory. The system models include central control, multiple actor based, deterministic, stochastic, differential equations, and spatial representation and graphics (at least two dimensional). Prerequisites: MATH2500 and BIOE2500 (4 credits)

BIOE3800  SPECIAL TOPICS IN BIOLOGICAL ENGINEERING
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the faculty assigned for more information about the course topic. (1 - 4 credits)

BIOE4000  CELL PHYSIOLOGY AND SIGNALING
This course focuses on intercellular communication via chemical, electrical and mechanical stimuli. Topics include membrane-bound and intracellular receptor proteins, cellular responses to receptor activation, membrane potentials, sensory receptors and the endocrine and nervous organ systems. Prerequisite: BIOL1100 (4 credits) spring

BIOE4500  BIOTRANSPORT PHENOMENA
This course explores transport phenomena (momentum, heat, and mass transfer) as related to biological systems. This includes microscale and molecular processes for membrane transport and perfusion, such as diffusion, osmosis, passive and active transport, and electrohydrodynamics. Dynamics of mechanical flow for fluid and heat are introduced for cells, tissues and organ systems. Prerequisites: BIOE2000, BIOE2500 and MATH2500 (4 credits) spring
Biology (BIOL)

BIOL1000 GENERAL BIOLOGY
Introduces basic principles of biology, including cell structure and function, and metabolism; genetics; reproduction; theories of evolution; classifications of organisms; plant form and function, animal form and function; community ecology and ecosystems dynamics. Emphasis placed on scientific inquiry. (4 Credits)

BIOL1050 GENERAL BIOLOGY II
Introduction to the evolution, biology and classification of vertebrates, including fish, amphibians, reptiles, birds and mammals. A comparative approach will be used to examine the respiratory, circulatory, endocrine, skeletal, nervous reproductive and digestive systems of vertebrates. Emphasis on evolution, speciation, behavior, spatial patterns, migration. Communications, thermal adaptations, communication, coloration and behavior of vertebrates may be emphasized. Lecture and laboratory components are included. Prerequisite: BIOL1000 (4 credits)

BIOL1100 CELL & MOLECULAR BIOLOGY
This course introduces basic principles of cellular and molecular biology. Topics include: properties of life, organic molecules, general features of cells, membrane structure, synthesis and transport, introduction to energy, enzymes and metabolism, cell respiration, photosynthesis, cell communication, extra cellular matrices, cell junctions, tissues, nucleic acid structure, DNA replication and chromosome structure, gene expression and regulation, mutation, the eukaryotic cell cycle, mitosis and meiosis, viruses and bacteria. (4 credits) fall, spring

BIOL1500 INTRODUCTION TO MEDICAL BIOTECHNOLOGY
This course introduces students to the central dogma of molecular biology and to insights on how medical biotechnology applications can be used to solve important social and medical problems for the benefit of humankind. Students will learn essential molecular biology techniques commonly used in modern research labs, including preparation of biological reagents, use of expression vectors, selective growth and transformation of bacteria, DNA synthesis and polymerase chain reactions (PCR), subcloning, electrophoresis and the use of bioinformatics databases and algorithms to design and perform successful cloning experiments. Prerequisite: BIOL1100 (4 credits)

BIOL1700 ANATOMY & PHYSIOLOGY I
This course covers the basic structure and function of the human body as an integrated set of systems. Topics include: functional compartments of the cells and body, tissues, mechanisms of communication, integration and homeostasis, an overview of the endocrine, nervous and sensory systems and the integrative control and mechanisms of body movement. Prerequisite: BIOL1100 (4 credits) fall, spring

BIOL1750 ANATOMY & PHYSIOLOGY II
This course covers the basic structure and function of the human body as an integrated set of systems. Topics include an overview of the cardiovascular, circulatory, respiratory, excretory and digestive systems and energy balance. Prerequisite: BIOL1700 (4 credits) fall, spring

BIOL2200 ADVANCED MOLECULAR BIOLOGY
This course takes an in depth look at the principles of modern molecular biology. Topics include: Organization of DNA into genomes, gene replication, recombination, repair, and cellular responses to DNA damage, RNA transcription, structure, function, processing and transport, protein translation and transport, cell cycle regulation, developmental regulation, and modern applications of molecular biology. Labs will provide functional training for a range of techniques commonly employed in molecular biology and genetics followed by application of methods to complete inquiry-based projects. The first portion of the semester student will investigate the impact of RNAI on transcription and translation; whereas, in the second half of the semester students will develop and execute a research project. Prerequisite: BIOL1100 (4 credits) fall

BIOL2990 INDEPENDENT STUDY IN BIOLOGY
This course investigates a topic of special interest to faculty and students that is outside regular course offerings. Prerequisites: Consent of the department head and instructor (1 - 4 credits)

BIOL3000 APPLICATIONS IN GENETICS
This course will explore the vast applications of genetics in biomedical science. Students will survey recently published primary research articles, read and discuss selected scientific literature and view relevant biomedical films or attend symposia in the Boston area, which emphasize the importance of genetics in biomedical progress. Topics will include: classical molecular genetics, genetic disease, genomics, genetic engineering, epigenetics and the social, moral, and ethical issues surrounding biomedicine. Prerequisite: BIOL1100 (4 credits) spring

BIOL3100 MICROBIOLOGY
This course introduces those concepts that are basic to viruses and prokaryotic and eukaryotic cells. Topics include microbial growth, evolution, and classification; descriptions of different prokaryotic, eukaryotic and other lifeforms and how the utilize these principles; the natural ecology of microorganism; the human use of microorganism; and how microorganism function in disease. Prerequisite: BIOL2200 (4 credits) summer

BIOL3200 CELL PHYSIOLOGY & SIGNALING
This course provides a conceptual framework of cell signaling processes that shape the behavior of single-celled and multicellular organisms. Topics include: protein-protein interaction, receptor molecules, molecular conformation, interaction, localization, modification and degradation, signaling networks, examples of important physiological pathways. Prerequisites: BIOL2200 and CHEM2500 (4 credits) fall

BIOL3750 MOLECULAR GENETICS & TRANSGENETICS
This course will explore the vast applications of genetics in biomedical science. Students will survey recently published primary research articles, read selected scientific literature and view relevant biomedical films or attend symposia in the Boston area, which emphasize the importance of genetics in biomedical process. Topics will include: classical molecular genetics, genetic disease, genetic engineering, epigenetics and the social, moral and ethical issues surrounding biomedicine. Laboratories will be primarily research-driven using Drosophila melanogaster as a model organism. Prerequisites: BIOL1100, BIOL2200 and CHEM3550 (4 credits)

BIOL3800 SPECIAL TOPICS IN BIOLOGY
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the semester schedule for the courses offered. (1 - 4 credits)
BIOL4400 SYNTHETIC BIOLOGY
This course explores the artificial design and engineering of macromolecules, molecular motors, biological systems and living organisms. Computational tools are utilized and developed in the course for synthetic biology. Prerequisites: CHEM3550, BIOE2000 and BIOE2500 (4 credits) summer

BIOL4500 MOLECULAR NEUROBIOLOGY
This course focuses on the molecular, cellular and biochemical events that underlie neuronal function. Specialization of nerve cells, neural development, and maturation of the central nervous system is taught at the cellular level. Emphasis is placed on the molecular pathways that facilitate the specialized function of neuronal cells and the molecular aspects of neural disease process. Prerequisites: BIOL2200; Corequisites: CHEM3550 (4 credits) spring

Biomedical Engineering (BMED)

BMED1000 INTRODUCTION TO BIOMEDICAL ENGINEERING
The course introduces the field of biomedical engineering with class activities that expose students to biomedical engineering careers, devices and systems related to medical diagnosis, treatment and rehabilitation. The course will include guest lectures by professional experts such as practicing biomedical engineers, physicians, and healthcare industry representatives. (2 credits)

BMED1599 QUANTITATIVE PHYSIOLOGY FOR ENGINEERS
Physiology of humans is explored from cells and tissues to organs and systems. Understanding of physiology is sought from the aspects of functional and control systems, and quantitative relationships. Topics include cell structure and function, mechanisms of homeostasis, membrane transport and biopotentials, skeletal muscle and motor control, nervous system, cardiovascular system, respiratory system, integrative physiology, and applications of engineered designs interacting with physiological systems. The course is intended to prepare students who are not in the Biomedical Engineering (BBME) program, and wish to work on interdisciplinary engineering projects involving biomedical applications. Prerequisite: MATH1750 or MATH1775; Corequisite: PHYS1750 (4 credits)

BMED2099 PHYSIOLOGY FOR ENGINEERS I
Provides the foundations of biochemistry, cell metabolism, reproduction and genetics, microorganisms, cells as organ subsystems, cells’ interaction with the environment. Will include laboratory projects and simulations. Prerequisites: CHEM1100 and PHYS1250; and MATH1750 or MATH1775 (4 credits)

BMED2500 BIOMEDICAL ELECTRONICS & INSTRUMENTATION
Introduction to biomedical electronics and instrumentation for clinical applications. Topics will include sensors for measurement of biomedical signals, bioelectric phenomena, nerve and muscle potentials, electrodes and amplifiers, electrocardiography, blood pressure, heart sounds, respiratory pressure, gas concentration, blood-gases, electromyography, electroencephalography, therapeutic and prosthetic devices, electrical safety of medical devices, and advances in medical instrumentation. Corequisites: ELEC2699 and BIOL1750 (4 credits) spring

BMED3099 PHYSIOLOGY FOR ENGINEERS II
Covers human physiology and anatomy, comparative physiology, the mechanism, types and prevention of diseases, and the environmental effects on human physiology. Will include laboratory projects and simulations. Prerequisite: BMED2099 (4 credits)

BMED3100 CLINICAL ENGINEERING PRACTICE
This course covers the basic models of clinical engineering practices and the role of clinical engineers in health care delivery organizations such as hospitals and clinics. Topics include clinical engineering department operations, managing safety programs, technology assessment, medical equipment planning, acquisition, commissioning, and management, selection of equipment in the design of clinical facilities, safe, effective and ethical use of medical devices in compliance with applicable regulatory standards and a clinical engineering design project. Prerequisite: BMED2500; Corequisite: MATH2750 (4 credits)

BMED3200 MEDICAL DEVICES AND SYSTEMS
This course covers various types of medical devices and systems. The topics include biosensors, signal processing and analysis, cardiac diagnostic and therapeutic devices involving electrophysiology and hemodynamics, respiratory, renal and neural devices and systems in clinical practice, life support and life saving devices, implants and artificial organs, imaging systems, anesthesiology machines, electrosurgical units, clinical laboratory equipment, Q.A., standards, regulatory affairs, FDA approval and medical device design. Prerequisite: BMED2500; Corequisite: MATH2750 (4 credits)

BMED3800 SPECIAL TOPICS IN BIOMEDICAL ENGINEERING
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (1 - 4 credits)

BMED4099 BIOMEDICAL SYSTEMS ENGINEERING
Covers biomedical modeling, design, applications: instrumentation, clinical experiments, biostatistics, ethics, biomechanics, biomaterials, bio-fluids, bioelectricity, bio-signal and image processing, physiological control systems. Will include laboratory projects and simulations. Prerequisites: Fifth-year status in BELM; BMED3099 (4 credits)

BMED4200 BIOMATERIALS & TISSUE ENGINEERING
This course covers the usage of biomaterials in biomedical engineering. Topics include the chemical structures, physical and mechanical properties of biomaterials, biomaterial degradation and processing, surface properties, protein and cell interactions with biomaterials, biomaterials implantation and acute inflammation, wound healing, immune response to biomaterials, biomaterials and thrombosis as well as infection, tumorigenesis and calcification of biomaterials. An overview of biomaterials applications and tissue engineering is provided and a biomaterials design project is required. Prerequisites: BIOL1100 and CHEM1100 and MECH3599 (3 credits)

BMED4300 SIGNALS AND SYSTEMS FOR BIOMEDICAL ENGINEERING
This course covers bioengineering signals and systems, signal processing, Fourier and Laplace transforms, transfer function, frequency selective filters, real time processing, adaptive filters, time-frequency and time-scale analysis, linear system identification, optimization, fuzzy models, compartment models and control systems. Selected biomedical applications include pulse oximetry, defibrillator output, blood pressure monitoring and closed-loop drug infusion control. Prerequisites: BMED2500 and MATH2750 (3 credits) spring
BMED4400 BIOMECHANICS
The overall objective of this course is to train students on problem-posing and problem-solving skills and illustrating how the fundamentals of mechanics are applied to biological problems. This course offers insight into the mechanics of hard tissue, musculoskeletal soft tissue, joint articulating surface motion, analysis of gait, mechanics of head and neck, biomechanics of chest and abdomen impact, cardiac biomechanics, heart and valve dynamics, molecular transport and regulation in microcirculation, modeling in cellular biomechanics and introduction to sports biomechanics. **Prerequisites:** MECH3599 and MATH2750 (4 credits) spring

BMED4450 DESIGN OF PROSTHETICS & IMPLANTS
This course covers the design process of prosthetic devices and implants from concept development to launch from technical perspective to regulatory approvals. The students will learn how to use the engineering principles to develop prosthetic devices and implants for treatment of different disorders. Topics include concept development, design for manufacturing, design optimization and validation, material selection and regulatory approval. **Corequisites:** BMED4200 and BMED4400 (4 credits) summer

BMED4500 ENGINEERING IN BIOMEDICINE
This course includes lectures by practicing professionals from medical devices research and development, manufacturing, hospitals, and regulatory agencies. It also includes presentations on ongoing biomedical research projects on campus and student co-operative work experiences. The course will also address current trends and emerging challenges in the biomedical engineering field. **Prerequisite:** senior status (1 credit) summer

BMED4550 MEDICAL ROBOTICS & ASSISTIVE TECHNOLOGY
This course covers the design, control and application of medical robotics and assistive technologies. The course includes surgical navigation, image guided interventions, robot assisted surgeries, as well as other medical robotic applications. The course will also cover assisted technologies, identifying the needs of disabled people, and the design and application of assistive devices. **Prerequisites:** BMED2500, BMED4400 and Senior Standing. (4 credits) summer

BMED4600 BIOSTATISTICS
This course, intended primarily for biomedical engineering students, covers topics including descriptive statistics, probability, sampling, sampling distribution, estimation, linear regression, hypothesis testing, analysis of variance, Baye’s theorem, probability distributions, multiple regressions, chi square distribution and other statistical methods to analyze biomedical data. Lab modules complement theoretical coverage and involve software applications and a group design project for medical applications. **Prerequisites:** BIOL1100 and COMP1000 and MATH2025 (4 credits) summer

BMED4700 BIOMEDICAL ETHICS & REGULATORY AFFAIRS
This course provides an overview of the ethical and regulatory affairs applied to biomedical engineering. The course covers ethics and Biomedical engineering practice and research, theories and principles of ethics, the code of ethics, ethical considerations in areas including clinical engineering, human enhancement, and implants. This course also covers medical devices and FDA regulatory requirements including medical device design control, review, testing, pre- and post-marketing and compliance. **Prerequisite:** BMED4500 (2 credits)

BMED4800 MEDICAL INFORMATICS & TELEMEDICINE
This course will expose the student to the fields of telemedicine and medical informatics. Topics include telemedicine technologies, telemedicine consultations, the importance of internet in telemedicine, mobile technology, healthcare data storage, healthcare data analytics, electronic health records and health information exchange, medical coding, health information privacy and security, and ethics in health informatics. **Prerequisites:** COMP1000 and BMED2500 (4 credits)

BMED4850 MEDICAL IMAGING & OPTICS
This course covers principles, operations and applications of diagnostic medical imaging systems including ultrasound, x-rays, computer tomography, and magnetic resonance imaging. The course also covers diagnostic applications of optics in medicine including microscopy, spectroscopy, and endoscopy. **Prerequisite:** BMED2500 (4 credits)

BMED5000 BIOMEDICAL ENGINEERING SENIOR DESIGN I
This course is for seniors that allows them to work in a group or as an individual to further their studies in a project-oriented style. Students in this course will work on their area of focus by taking an interdisciplinary approach to solve a technological problem in the biomedical field. The work done in this course will be performed under the supervision of one or more faculty advisors. Oral and written progress reports are reviewed and iteratively refined throughout the semester. The technical report of the work at the end of the semester is coupled with a formal presentation to the class. This course is followed by BME Senior Design II. **Prerequisites:** senior status and completion of one co-op in a medical organization or academic research (3 credits)

BMED5050 ARTIFICIAL INTELLIGENCE & ANALYTICS IN HEALTHCARE
The Artificial Intelligence (AI) and Analytics in Healthcare course covers applications of AI theory in disease diagnosis and health data analytics. Topics include Artificial Neural Networks, Fuzzy Logic, Application of AI and Analytics in diagnosis of disease such as cancer, genetic programming for knowledge discovery in chest-pain diagnosis. Lab experiments will include development of AI models and algorithms that solve selected real-world medical and healthcare decision making problems. **Prerequisites:** MATH2750, **Corequisites:** BMED4300 and BMED4600 (4 credits) summer

BMED5500 BIOMEDICAL ENGINEERING SENIOR DESIGN II
This course is a continuation of BME Senior Design I. Students are expected to continue with their design and development activities from the previous course and focus on design improvements and applications of the product. Supervising faculty and invited industry professionals will review the student’s prototypes and make recommendations. Students will submit a report on the designed product and make a presentation to the class, supervisors, invited faculty, alumni and other interested parties. **Prerequisite:** BMED5000 (3 credits)

Building Construction (BLDG)

BLDG1015 CONSTRUCTION GRAPHICS
The development and interpretation of civil, architectural, structural, and electrical drawings; freehand sketching of construction details and sections; computer-aided construction drafting. (4 credits)

BLDG1050 CONTRACTS & CODES
A comprehensive study of construction contracts including conditions of agreement and modifications. Students analyze the Massachusetts State Building Code as it applies to buildings. **Prerequisites:** BLDG1015 and BLDG1100 (4 credits)
BLDG1100 CONSTRUCTION METHODS
A detailed study of current methods and equipment used in timber, masonry and steel construction. Laboratory exercises emphasize plan reading. (4 credits)

BLDG1500 CONSTRUCTION ESTIMATING
The fundamentals of construction estimating are covered. Quantity surveys are made for various building components and prices determined for labor and materials, using a current pricing handbook. Computer techniques and applications are also examined. Prerequisites: BLDG1015 and BLDG1100; or BLDG1015 and enrollment in the Professional Certificate in Managing Construction Projects (4 credits)

BLDG1600 HORIZONTAL CONSTRUCTION
Survey of current methods and equipment used in heavy construction projects including highways, tunnels, bridges, dams, storm drains and sanitary sewers. Prerequisite: BLDG1100 (2 credits)

BLDG1900 BASIC BUILDING SERVICES
Examines the basic building services, including heating, water, plumbing, drainage, ventilation, air-conditioning, vertical transportation, acoustical control, electrical controls, and associated building code requirements. (4 credits)

BLDG2000 STRUCTURAL DESIGN I
Topics include the principles of mechanics with emphasis on the use of dimensions, weights, forces and angles, centroids, center of gravity, free body diagrams and the laws of equilibrium as applied to trusses. Prerequisite: MATH1065 and PHYS1005

BLDG2200 BUILDING INFORMATION MODELING
This course examines the use of Autodesk’s REVIT software platform as a complete building design and documentation solution, supporting all phases of design, construction documentation, and construction management required for a building project. Students will create massing and conceptual studies that evolve into building models with schedules, details, renderings, walk-throughs, and other topics via studying real-world building designs. Prerequisite: BLDG1015 (4 credits)

BLDG2500 PROJECT ESTIMATING & SCHEDULING
Students learn and apply the basic principles and current practices employed in estimating project costs including unit costs, overhead and profit. Scheduling tools, such as critical path method and bar charts, are examined as an aid and technique in project planning, budgeting and cost control. Prerequisites: BLDG1015 and BLDG1100 (4 credits)

BLDG2600 TESTING OF MATERIALS
Testing of Materials focuses on how to properly determine the properties of the most common construction industry materials. These materials include soils, aggregates, asphalt, concrete, steel, wood and masonry. Particular attention is paid to proper laboratory techniques for data acquisition and reporting. (2 credits)

BLDG3100 CONSTRUCTION OPERATIONS
Material handling in heavy construction. The selection and application of heavy construction equipment including equipment productivity and cost Pre-Requisite: BLDG1100 (4 credits)

BLDG3200 CONSTRUCTION PROJECT SCHEDULING
Topic items include project network planning, scheduling, and cost control models. Computer applications to PERT and CPM will be explored and used by the student. Prerequisites: BLDG1100 and third year status or BLDG1500 and enrollment in the Professional Certificate for Managing Construction Projects (4 credits)

BLDG3450 CONSTRUCTION PROJECT COST ANALYSIS
This course will also introduce students to modern techniques for analyzing costs for both vertical and horizontal construction. Costs will be compared to a baselines established for project control. Students will analyze the variety of factors and different methods that affect construction costs. Primary class emphasis is on the cost analysis process available to project managers. Prerequisite: BLDG3200 (4 credits)

BLDG3600 CONSTRUCTION MANAGEMENT THEORY
Construction project management from conception to completion is covered. The course covers feasibility studies, site selection, planning, programming, design coordination, and contracting procedures of actual construction. Emphasis is placed on contractor operations, project administration, job planning, and subcontract coordination. Prerequisite: third year status; or BLDG1500 and enrollment in the Professional Certificate in Managing Construction Projects (4 credits)

BLDG3700 CONSTRUCTION SAFETY & RISK MANAGEMENT
Topics include the knowledge and skills required to effectively manage safety compliance and risk associated with construction. Prerequisite: BLDG1100 (3 credits)

BLDG3800 SPECIAL TOPICS IN BUILDING CONSTRUCTION
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the semester schedule for the courses offered that semester. Contact the faculty assigned for more information about the course topic. (1 - 4 credits)

BLDG4250 FINANCING CONSTRUCTION PROJECT
An investigation of construction financing during all phases of project development. Topic items include: permanent loans, construction loans, sources of mortgage funds and venture capital, and tax and interest considerations. Emphasis is placed on the role of the banker as a vital member of the construction management team. Prerequisite: third year status (4 credits)

BLDG5500 SENIOR PROJECT IN BUILDING CONSTRUCTION MANAGEMENT
Students have the opportunity to explore and present on a construction management topic of their choice. A final oral presentation is required. (4 credits)

Chemistry (CHEM)

CHEM1000 CHEMISTRY OF THE BUILT ENVIRONMENT
This course provides a fundamental introduction to chemistry topics with a focus on the built environment. Fundamental principles of chemistry with emphasis on solving problems encountered in business and commerce. Topics include: the atomic model; writing, balancing; and predicting reactions; stoichiometry; the periodic table; properties of acids, bases, and salts; properties of aqueous solutions. Corequisite: MATH1000 (4 credits) fall, spring

CHEM1005 CHEMISTRY A
This course will introduce the students to basic concepts in chemistry through contemporary applications. Topics will include atomic model and periodic chart, solutions, chemical formulas, balancing chemical reactions, and acids and bases. Laboratory sessions illustrate principles. Prerequisite: MATH1005 (4 credits)
CHEM1100 GENERAL CHEMISTRY I
An introduction to chemistry for technical majors, covering atomic structure, molecular orbitals and bonding, reduction/oxidation, metals, and modern materials. There is a focus on the understanding of atomic and molecular structure, and its effects on bulk structure. Laboratory exercises supporting the understanding of the lecture topics will be included, with a focus on good laboratory practice. (4 credits) fall, spring.

CHEM1600 GENERAL CHEMISTRY II
A second semester of introductory chemistry covering topics in nuclear structure and reactions, solution chemistry and colligative properties, chemical kinetics, chemical equilibrium, thermodynamics, and electrochemistry. An introduction to advanced topics in environmental chemistry, transition metals and organic chemistry is included. Multi-concept laboratory projects that connect to lecture topics are used, with an emphasis on good laboratory technique, experimental design, data collection and critical evaluation data. **Prerequisite:** CHEM1100 (4 credits) fall, spring

CHEM2000 BASICS OF ORGANIC & BIOCHEMISTRY
This course is intended to introduce students to key concepts in organic chemistry and biochemistry, and to describe the significant connections between these topics and health, disease and the molecular treatment of disease. Specific topics include saturated and unsaturated hydrocarbons, alcohols, phenols, esters, aldehydes, ketones, carboxylic acids, amines, carbohydrates, lipids, proteins, enzymes, nucleic acids, molecular genetics and metabolism. **Prerequisites:** BIOL1100 and CHEM1100 (4 credits) fall, spring

CHEM2200 PROTEINS MEDICINE & DISEASE
A second semester in introductory chemistry focusing on the relevance of protein sequence and structure in health, disease and drug design. Specific topics include introduction to organic molecules, enzyme kinetics and inhibition and protein structure. There will also be an emphasis on correlating protein chemistry aspects to mechanisms of disease, methods of drug discovery, and computational methods used in the drug discovery process. A combination of projects involving wet and computational laboratory methods will be included. **Prerequisite:** CHEM1100 (4 credits)

CHEM2500 ORGANIC CHEMISTRY I
This course is an introduction to organic chemistry. It covers basic organic nomenclature and functional groups, stereochemistry, the reactions of alkanes, alkenes, and alkynes, and instrumental analysis of organic molecules. **Prerequisite:** CHEM1600 (4 credits) fall

CHEM2990 INDEPENDENT STUDY IN CHEMISTRY
This course investigates a topic of special interest to faculty and students that is outside regular course offerings. **Prerequisite:** Consent of department head and instructor (1 - 4 credits)

CHEM3500 ORGANIC CHEMISTRY II
This course is a continuation of Organic Chemistry I. It covers benzene and its associated reactions, alcohols and their associated reactions, an introduction to carbonyl chemistry, as well a continuation of instrumental analysis as applied to these classes of molecules. Conjugated systems and their detection using UV/V is spectroscopy will be introduced. Polymer chemistry and lipids are also addressed. **Prerequisites:** CHEM2500 (4 credits) spring

CHEM3550 BIOCHEMISTRY
This course starts with structural descriptions of macromolecules, with particular focus on proteins and the structure/function relationships. Enzymes and the principles of catalysis are discussed, followed by a comprehensive survey of the pathways and regulation of metabolism, including glycolysis, the Krebs Cycle, electron transport, as well as lipid, carbohydrate, and protein metabolism. Laboratory exercises supporting the understanding of the lecture topics will be included, with a focus on good laboratory practice. **Prerequisites:** CHEM1100; and CHEM2000 or CHEM2500 (4 credits) summer

CHEM3600 INORGANIC CHEMISTRY
This course will introduce students to bonding and structure of inorganic molecules. This course covers atomic and molecular bonding theories, symmetry, group theory, crystal structures, coordination chemistry, organometallic chemistry, and an introduction to material science. Computational techniques will be used to supplement the understanding of transition metal geometric and electronic structure. In lab, students will perform several advanced syntheses of inorganic coordination compounds and organometallic compounds. **Prerequisite:** CHEM2500 (4 credits) summer

CHEM3800 SPECIAL TOPICS IN CHEMISTRY
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for the courses offered that semester. (1 - 4 credits)

CHEM4200 ADVANCED LABORATORY TECHNIQUES IN CHEMISTRY
In this course students will apply a wide range of theoretical concepts and laboratory skills learned in previous courses, and apply them to rigorous synthetic challenges. Students will synthesize and characterize multiple compounds of interest, developing laboratory skills and a deeper appreciation for the connection between theory and practice. **Prerequisites:** CHEM3500 (4 credits) fall

Civil Engineering (CIVE)

CIVE2000 STATICS & MECHANICS MATERIALS I
Introduces solid mechanics including properties of areas and volumes (centroidal axis, center of gravity and moments of inertia), equilibrium of particles and rigid bodies in two and three dimensions, analysis of internal forces in trusses and frames and shear and moment diagrams for beams. **Prerequisites:** MATH1750 or MATH1775; and PHYS1250; **Corequisite:** MATH1850 or MATH1875 (3 credits) fall

CIVE2205 INTRODUCTION TO GEOMATICS
This course provides various elements of plane surveying, use of a level, total station and global positioning system; topographical surveying and mapping; error adjustment; area and volume computation; curve layout and site development; use of various computer application programs. (4 credits) fall

CIVE2300 CAD IN CIVIL ENGINEERING
This course provides the student with an understanding of the role of the engineer on a design team and the importance of standards. It also provides the knowledge and practice of computer-aided design and drafting, and the use of AUTOCAD and CIVIL3D software in civil engineering design. (3 credits) spring
CIVE2400 CIVIL ENGINEERING MATERIALS
Study of elemental and behavioral properties of steel, aluminum, aggregate, cement, concrete, asphalt, plastics, polymer composites, and wood. Uses in civil engineering and construction engineering applications with consideration to life cycle and longevity are also addressed. **Prerequisite:** CHEM1100 (3 credits) spring

CIVE2500 STATICS & MECHANICS MATERIALS II
The study of internal stresses induced by external loads on beams, trusses and axially loaded members of differing materials. Discussion and problems include sectional properties, stress-strain behavior, temperature effects, column buckling and combined stresses. Concepts are illustrated through student participation in laboratory experiments. **Prerequisite:** CIVE2500 (4 credits) spring

CIVE3000 FLUID MECHANICS
Fundamental physical and analytical principles of fluid mechanics through the understanding of the: conservation of mass, conservation of energy, and the conservation of momentum equations. A demonstration of the understanding of these fundamentals by solving problems dealing with: fluid properties, fluid statics, pressure on plane and curved surfaces, buoyancy and flotation, kinematics, systems, control volumes, conservation principles, ideal incompressible flow, impulse-momentum, and flow of a real fluid. **Prerequisites:** CIVE2000 and MATH1850 (4 credits) fall

CIVE3100 ENVIRONMENTAL ENGINEERING
This course provides an introduction to environmental engineering concepts with respect to natural and man-made systems of the built environment. Particular emphasis is placed on material and energy balances and principles of thermodynamics and applied chemistry. **Prerequisite:** CHEM1100 (4 credits) fall

CIVE3125 ENGINEERING SYSTEMS ANALYSIS
This course provides an introduction to system optimization and analysis, problem solving and decision making in planning management and design, math modelling of qualitative decision problems, distribution and network models, decision analysis, waiting line models and project scheduling. **Prerequisite:** MATH1850 (3 credits) fall

CIVE3150 ADVANCED SURVEYING
Building upon competencies developed in the Introduction to Geomatics course, students will develop additional competencies in precise leveling, construction layout, static GPS, site detail mapping with RTK level adjustment, 3D GPS network adjustment. Additional topics covered include measurement error propagation theory, geodesy, map projections, and the US state plane coordinate system. **Prerequisite:** CIVE2205 or CONM2000 (4 credits) fall

CIVE3200 STRUCTURAL ANALYSIS II
The study of statically determinate and indeterminate structures including: structure determinate/indeterminate checks, structure stable/unstable checks, truss analysis, moment and shear equations and diagrams for structures, influence lines, maximum shears and moments for movable loads, energy method for deflections, moment distribution method for indeterminate beams and frames, slope deflection method for indeterminate beams and frames and an introduction to the stiffness method of analysis. **Prerequisite:** CIVE2500 (4 credits) fall

CIVE3250 GIS APPLICATIONS IN CIVIL ENGINEERING
Students will gain an understanding of the basic components, functions of and terminology associated with Geographic Information Systems. Each student will create a typical GIS for civil engineering use. In doing so, they will develop specific competencies in: creating and populating geodatabases; basic data manipulation functions; data editing, and georeferencing Spatial and 3D analysis tools, symbology and general cartographic principles will be utilized by the students in the creation of small scale and large-scale models and maps useful in civil engineering design. **Prerequisite:** CIVE2205 or CONM2000 (3 credits) summer

CIVE3300 SOIL MECHANICS
Study of soil, rock and underground water and their relation to design, construction and operation of civil engineering works. Topics include: origin and composition of rock and soil, soil classification, site exploration and instrumentation, compaction, in-situ stresses, soil compressibility and settlement, shear strength of soil, soil permeability and groundwater flow. Study includes evolution of concepts, derivation of theories, and illustrative applications using actual geotechnical problems and projects. **Prerequisites:** CIVE2000 and CIVE2500 (4 credits) fall

CIVE3325 EMBANKMENTS, DAMS & SLOPE STABILITY
In this course, the fundamental concepts and principles of design and construction of embankments, earth dams and unsupported slopes are studied. In addition, different methods of slope stability analysis are covered in this class. A project on unsupported slope stability will be assigned to students as a project. Students are asked to design an unsupported slope and validate their design using common geotechnical engineering software. **Prerequisite:** CIVE3300 (3 credits) summer

CIVE3350 GREEN ENGINEERING
This course will provide a foundation for topics in green engineering. This course will teach students an innovative design perspective needed for a fundamental conceptual shift from the current paradigms of design towards a more sustainable system, based on efficient and effective use of materials, water and energy. **Prerequisite:** CHEM1100 (3 credits)

CIVE3375 EARTH RETAINING STRUCTURES
Design of earth retaining structures, such as retaining walls, MSE (Mechanically Stabilized Earth), and SRW (Segmented Retaining Walls), Soil Nail Walls, excavation support walls, and waterfront bulkheads. Topics include earth pressures, retaining wall designs, tieback and anchorages, slurry walls, sheet pile selection, soil nails for excavation stabilization and use of geo-synthetics. **Prerequisite:** CIVE3300 (3 credits) summer

CIVE3400 STRUCTURAL ANALYSIS II
Study of the use of matrix methods in structural analysis of determinate and indeterminate structures. Using linear algebra, the basics of matrix analysis such as degrees of freedom, coordinate systems, and other features are discussed. The structural elements are developed, such as truss and beam elements, using Virtual Work principles. The Stiffness Matrix and Stiffness Method are developed through Virtual Work. The matrix method is used to solve complex structures which include frames, trusses, elements of varying shapes, elements subjected to non-uniform loading between nodes, the movement of supports, and temperature changes. **Prerequisite:** CIVE3200 (3 credits) spring
CIVE3425 DYNAMICS OF STRUCTURES
Study of the principles of kinetics and kinematics related to the behavior of structures and their components under dynamic loads. In this introductory course, only single degree of freedom systems are addressed. Frequencies and periods of damped and undamped systems are addressed. Harmonic, impulse and arbitrary forces are introduced into the single degree of freedom structures. Also, this course will use the seismic methodologies of the International Building Code. **Prerequisite:** CIVE2500 (3 credits) spring

CIVE3450 LEGAL ASPECTS OF BOUNDARY SURVEYING
This course is an introduction to real estate law and boundary determination principles that are essential to the practices of land surveying. Real estate law, conveying terminology, evidence gathering, and research theory will be taught. Key principles of boundary law will be explored such as the relative weight of evidence, sequential and simultaneous conveyances, easements and rights of way, and the public land survey system. **Prerequisite:** CIVE2205 or CONM2000 (3 credits) spring

CIVE3500 DESIGN STUDIO LAB
This experiential studio will link several of the civil engineering disciplines in a series of three two-hour studios per week. The studios will be tied together by a common site and features developed by civil engineering faculty. **Prerequisite:** Junior standing (3 credits)

CIVE3700 HIGHWAY ENGINEERING
Introduction to principles of highway engineering, including the history of transportation engineering, fundamentals of traffic flow and driver characteristics, intersection design and control, capacity and level of service of highways and intersections, geometric design of highways, highway drainage, principles of pavements, design of flexible and rigid pavements, and pavement management. **Prerequisite:** CIVE2205 (4 credits) summer

CIVE3800 SPECIAL TOPICS IN CIVIL ENGINEERING
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (1 - 4 credits)

CIVE3900 HYDRAULIC ENGINEERING
This course applies the principles of fluid mechanics to the design and analysis of hydraulic systems. The course emphasizes open channel flow and other topics of interest to the civil engineer. Topics include hydraulic grade line calculations, pump design, culvert analysis and design, based flow elevation studies using Hydro-CAD, non-uniform flow, gutters and inlets, water distribution, and open channel design. **Prerequisite:** CIVE3000 (4 credits) summer

CIVE4000 CIVIL ENGINEERING DESIGN PROJECTS
This course provides the student with an independent, project-based learning opportunity in a topic within the civil engineering discipline. EPIC Course **Prerequisite:** Senior status (4 credits) spring

CIVE4050 BOUNDARY SURVEYING
Building on the principles taught in Legal Aspects of Boundary Surveying, special boundary topics such as water boundaries, unwritten transfers, Torrens Title systems. Land Title Surveys, Survey Reports and writing legal descriptions will be covered along with the roles of statute and case law in the boundary determination process. Students will complete a final project that will involve making boundary decisions involving conflicting evidence. **Prerequisites:** CIVE3150 and CIVE3350 (3 credits) summer

CIVE4100 WATER RESOURCES AND HYDROLOGY
An introduction to surface water and groundwater hydrological processes and systems, including stormwater management, water supply and contaminant transport and modeling. **Prerequisite:** CIVE3000 (3 credits)

CIVE4125 CIVIL ENGINEERING & PROJECT MANAGEMENT PRACTICES & PRINCIPLES
Introduction and development of principles and practices to effectively manage civil projects through all phases, including inception/concept, design, planning, construction commissioning and completion. Emphasis will be placed on Financing, Scheduling, Value Engineering and Evaluation and Project Organization. **Prerequisite:** Senior Status (4 credits) spring

CIVE4150 LAND USE PLANNING
An introduction to land use planning and management approaches through the review of the theory and regulations involved in the planning and development of residential / commercial sites, subdivisions, office parks, and industrial parks. **Prerequisite:** CIVE2300 (3 credits) summer

CIVE4175 ESTIMATING, SCHEDULING & PROJECT CONTROL
An introduction to the Fundamentals of Construction Management, Construction Estimating, and Construction Scheduling. **Prerequisite:** CIVE2300 (3 credits) summer

CIVE4200 GEOLOGY FOR CIVIL ENGINEERS
Study of geological processes, structures and component elements to understand the behavioral effects on civil engineering works and resources, including; types of rocks and their origin, types and transportation of soils, groundwater occurrence and movement, earthquake causes and ramifications, subsurface investigation, and environmental and engineering geology. (3 credits)

CIVE4225 ENVIRONMENTAL UNIT OPERATIONS
In this course students will learn to characterize, design and evaluate environmental unit operations using mathematical, chemical and engineering concepts. The general operating fundamentals of physical, chemical and biological systems are presented. Special unit operations designed by environmental engineers are also reviewed and evaluated. This elective course is offered for students interested in environmental engineering and is a required course in the Environmental Engineering minor. **Prerequisite:** CHEM1100, **Corequisite:** CIVE3100 (3 credits)

CIVE4250 STRUCTURAL STEEL DESIGN
Introduction to the design of structural steel tension, compression and flexural members including connections. Design for combined loads is also introduced. Both member strength and serviceability requirements are considered. The LRFD philosophy of the latest AISC Steel Construction Manual is employed. **Prerequisite:** CIVE3200 (3 credits)

CIVE4300 FOUNDATION ENGINEERING
In this course, the fundamental concepts and principles of shallow and deep foundation design and in-service behavior are studied and applied. Conditions where shallow foundations are not appropriate are reviewed as is selection of appropriate types of deep foundations. Two foundation design projects are included in course work. **Prerequisite:** CIVE3300 (3 credits)

CIVE4350 REINFORCED CONCRETE DESIGN
Introduction to the design of reinforced concrete members including beams, columns and one-way slabs. Both member strength and serviceability requirements are considered. The design approach is ultimate strength consistent with the provisions of the latest edition of ACI:318. Relevant connection details associated with the design elements are also addressed. The use of commercial software to verify the student’s design will be used to supplement the course. **Prerequisite:** CIVE3300 (3 credits)

CIVE4375 WATER AND WASTEWATER TREATMENT
This course provides an introduction to the principles of water and wastewater treatment, including the various treatment options and unit operation design. (3 credits)
CIVE4400 MUNICIPAL PLANNING
This course covers the regulations and engineering principles involved in the planning and development of residential and commercial sites, office parks, and industrial parks. **Prerequisite:** CIVE3900 (3 credits)

CIVE4425 TRAFFIC SYSTEMS ANALYSIS
Subjects include traffic signals and controls, traffic system analysis, microscopic level simulations, VBA coding, level of service analysis. **Prerequisite:** CIVE3700 (3 credits) spring

CIVE5500 CIVIL ENGINEERING CAPSTONE DESIGN
This course provides the student with a comprehensive, multidisciplinary, group, project-based civil engineering capstone design opportunity and allows these projects to be performed in an EPIC format. **Prerequisite:** Senior status (4 credits) summer

CIVE8000 PROJECT MANAGEMENT PRINCIPLES & PRACTICES
Introduction and development of principles and practices to effectively manage civil projects through all phases, including inception, design, planning, construction commissioning and completion. Emphasis will be placed on Financing, Scheduling and Evaluation and Project Organization. (3 credits)

CIVE8100 ENGINEERING MODELING & ANALYSIS
Computational approaches to modeling with applications in construction, structures, transportation, water resources and other civil engineering areas; matrix computations, digital terrain modeling, network applications and algorithms, heuristic optimization. Development of the finite element method with an emphasis on understanding the fundamental principles governing the analysis technique. Applications to two-dimensional solids with particular attention to applications in structural engineering. **Corequisites:** CIVE8000 and CIVE8200 (3 credits)

CIVE8200 ENVIRONMENTAL SYSTEMS
Overview of infrastructural development. Sustainable design features for facilities including municipal, transit, industrial, telecommunications, and waste management. Impact of infrastructure development on environmental management including storm water quality and quantity, soil and channel erosion, air quality, sprawl, and waste production, treatment, and storage. (3 credits)

CIVE8250 ENGINEERING ESTIMATING & SCHEDULING
Estimating subjects include quantity take-off methods, cost estimating, engineering economics and value engineering. Scheduling subjects include construction sequencing, CPM network analysis, activity time analysis, resource scheduling and time-cost trade-off. **Prerequisite:** CIVE8000 and CIVE8100 and CIVE8200 (3 credits)

CIVE8300 TRAFFIC ANALYSIS & SAFETY
Subjects include traffic capacity studies, traffic signals and controls, speed studies, intersection analysis, traffic volume studies, sight distance evaluation, pedestrian facilities, multi-modal systems and traffic safety analysis. **Prerequisite:** CIVE8000 and CIVE8100 and CIVE8200 (3 credits)

CIVE8350 CONSTRUCTION OPERATIONS, METHODS & QUALITY CONTROL
Fundamentals and applications of engineering aspects of lifting and rigging, crane selection, erection and stability, dewatering and pumping, equipment production, productivity analysis and improvement, and temporary erosion control. **Prerequisite:** CIVE8000 and CIVE8100 and CIVE8200 (3 credits)

CIVE8400 HIGHWAY DESIGN & TRANSPORTATION PLANNING
Design of roadway systems, including vertical and horizontal curves, super elevation, vertical and horizontal clearances, acceleration and deceleration, intersection and interchanges, traffic impact and capacity analysis and transportation planning. (3 credits)

CIVE8450 TEMPORARY STRUCTURES
Fundamentals of engineered structures at a jobsite including construction loads, formwork, falsework and scaffolding, shoring and reshoring, concrete maturation and early strength evaluation, bracing, anchorage, cofferdams and relevant codes and standards. **Prerequisite:** CIVE8000 and CIVE8100 and CIVE8200 (3 credits)

CIVE8500 GEOTECHNICAL ENGINEERING FOR INFRASTRUCTURE
The diverse geotechnical and foundation engineering issues in design of infrastructure are covered, including technical principles and practical application of geotechnical design for both shallow and deep foundations, buried pipes, embankments and dams. The course emphasizes first the appropriate interpretation of site subsurface conditions as revealed through test borings and lab testing results. The selection of appropriate possible types of foundation systems and the design of foundations through appropriate analyses is covered. Load conditions on buried pipes and culverts are studied. Compaction of soil for earth embankments and earth dams is also studied, as are the potential for settlement and its mitigation. For each type structure, the designating of necessary construction constraints and specification content is reviewed. (3 credits)

CIVE8550 SITE PLANNING & DEVELOPMENT
The course provides a comprehensive review of land development for previously undeveloped and developed land. Engineering topics include land use and zoning requirements, earthworks, grading and land-forming, materials management, utility design and layout, road and parking works, environmental design and site work sequencing. Management topics include project financing, permitting, bidding and contracting. **Prerequisite:** CIVE8000 and CIVE8100 and CIVE8200 (3 credits)

CIVE8600 ADVANCED STEEL & CONCRETE DESIGN
The course continues from basic steel and concrete design coursework. The course addresses advanced topics in structural steel and reinforced concrete design following the LRFD, AISC design specification and the ACI 318, Building Code Requirements. Structural steel topics included design of plate girders, composite steel and concrete members, and moment frames. Connection design will include bolted and welded connections using the instantaneous center approach, braced frame connections and moment frame connections. Reinforced concrete topics include the design of two-way slabs, deep beams using non-linear strain distribution and the strut and tie method, slender columns, and pile cap foundations. Seismic design of selected topics for both materials will also be addressed. The use of commercial software to verify student’s design will be used to supplement the course. (3 credits)

CIVE8700 BRIDGE DESIGN
The course addresses the design of highway bridges using the AASHTO LRFD design specifications. Bridge types and the bridge selection process are discussed. The course addresses the design limit states, loads, load combinations, distribution factors and the principle of probabilistic design. The design of both steel (1-shaped and box girders) and concrete (ASSHTO Standard 1-shapes and bulb tees) are covered. Bridge design for other infrastructure system such as rail and transit will be discussed. The use of commercial software to verify student’s design will be used to supplement the course. **Prerequisite:** CIVE8000 and CIVE8100 and CIVE8200 (3 credits)

CIVE8800 INFRASTRUCTURE RENEWAL
This course addresses fundamental engineering practices to inspect, evaluate, maintain, repair and replace aging infrastructure. Infrastructure systems studied in this course include bridges, tunnels, dams, utilities and highway and other transportation systems. The course will focus on infrastructure systems, primarily in urban settings. (3 credits)
COMM4112 SOCIAL PERSPECTIVES JOURNALISM
This course directs students in developing a perspective for the basics of the news process: gathering, reporting and disseminating news. The role of the journalist in American society and the changing role of news and society will be discussed. The changing role of news and the newspaper is also discussed and analyzed, particularly as they pertain to an increasing population of society that access, read and interpret the news via on-line newspapers, logs, streaming and archived podcasts, and via the Internet and websites. Prerequisite: completion of an English Sequence (4 credits)

COMM4122 ORAL COMMUNICATIONS
This course will introduce the student to the basics of public speaking and communications. Students will be involved in speech preparation, development and delivery. This course also provides students with assistance in developing and using appropriate visual aids. Topics pertaining to audience analysis, speech anxiety, research, performance and wording will also be addressed. Individual and team presentations will be required. Prerequisite: completion of an English sequence (4 credits)

COMM4262 PUBLIC RELATIONS WRITING
Students will be exposed to and examine the issues and role of the public relations practitioner and media messages. They will also learn public relations writing/communication style which will be utilized to prepare press releases, public service announcements and related materials. Prerequisite: completion of an English Sequence (4 credits)

COMM4300 MEDIA ETHICS
Claims of democratizing power of the media are ubiquitous: the media (and in particular the internet) have been credited with the rebirth of democracy. Simultaneously, the relaxation of media ownership rules in the U.S., the degradation of journalism and newspapers, the increased pressures on profitability over high quality content pose questions about whether media's impact has been entirely positive. These competing perspectives force us to ask, specifically: is media creating a thriving democracy or failing "idiocracy"? The goal of this course will be to consider what the ethical obligations of the media are in a democratic society and whether the media have met those obligations. Prerequisite: completion of an English Sequence (4 credits)

COMM4305 WEB ANALYTICS & MEDIA RESEARCH
Students learn how to use Google Analytics to measure performance of a website and how to adjust content to increase clicks and improve site performance. Additional emphasis is given to Facebook and Twitter analytics. Other topics include fundamentals in research design, measurement, data collection and analysis; the design and execution of surveys, focus groups, content analyses, among other primary research methods; industry applications for media research. Students improve their communication, writing and social science research skills by interpreting the meaning of data, documenting their recommended course of action, and communicating their findings to stakeholders. Teaching methods in this course include interactive software training, client projects, discussions and lecture. Prerequisites: Completion of an English Sequence (4 credits)
COMM4310 MEDIA & INNOVATION MANAGEMENT
Strategic decisions that led to some of the greatest successes and failures of companies like Netflix, Google and Nintendo are studied to establish an understanding of foundational economic and managerial principles. Students learn to apply traditional strategic management techniques including Porter’s Five Focus, VRIO tables, and the BCG matrix, as well as innovation-driven approaches that address how to create blue ocean strategies and benefit from disruptive technologies. Consideration is given to what makes media companies unique, and how the need to satisfy both audiences and advertisers can affect day-to-day operations. Students improve their professional communication, writing and social science research skills by composing and presenting an original case study about a contemporary media/tech firm. Teaching methods in this course include discussions, lectures, presentations, and project-based learning. Prerequisites: Completion of an English Sequence (4 credits)

COMM4315 INTRODUCTION TO ADVERTISING
Students learn how the fundamentals of advertising lead to successful multiplatform campaigns across television, radio, print and social media. The course balances industry related topics, including market segmentation, targeted advertising, and account planning, with artistic-related topics, including creative strategy development, visual art design, and copywriting. Additional emphasis is given to automated online advertising platforms and native advertising. Students improve their persuasive communication, media literacy, and multimedia production skills by creating and pitching a multiplatform ad campaign. Teaching methods in this course include lecture, case study discussions, multimedia content analyses, and ad production training. Prerequisites: Completion of an English Sequence (4 credits)

COMM4320 COMMUNICATION WITH PHOTOGRAPHY
The ubiquity of the camera makes us all amateur photographers and consumers of imagery. This course is designed to examine the visual medium of photography both from a production and consumption perspective. Students will be introduced to the technical elements of digital and analog cameras to develop a clearer use of photographic “language.” In addition, students will be introduced to the history of photography and discuss the socio-cultural impact of its democratization, including photography’s relationship with social media. Students will produce photographic works weekly and learn to hone their ability to communicate through the visual medium. Prerequisite: Completion of an English Sequence (4 credits)

COMM4325 COMMUNICATING WITH VIDEO
This course allows students to explore the creative and expressive elements of the time based medium of video. Students will become proficient in using digital camera, sound equipment, and editing software as a vehicle for developing their own personal vocabulary of the formal elements of cinematography. Because this is a studio course, students will work individually and in small groups to produce a variety of short films that span a wide variety of genres. Prerequisite: Completion of an English Sequence (4 credits)

Computer Science (COMP)

COMP1000 COMPUTER SCIENCE I
An introductory course covering the fundamental concepts and skills of programming in a high-level language. Emphasis is placed on problem solving, algorithm development, program design and structure, code documentation and style, and testing and debugging. Topics include hardware and software systems, data types and variables, device/file input and output, flow control and functions, use of basic data structures, as well as principles and applications of object-oriented programming. (4 credits) fall, spring

COMP1050 COMPUTER SCIENCE II
This course is an advanced introduction to computer science. It focuses on object-oriented programming. Topics include abstraction and encapsulation, classes and methods, objects and references, overloaded operators, polymorphism, interfaces, console/file input/output, dynamic data structures, generics, and GUI applications. Prerequisite: COMP1000 or ELEC3150 (4 credits) fall, spring

COMP1100 INTRODUCTION TO NETWORKS
This course introduces the students to routing, packet forwarding, and switching technologies. Both static routing and dynamic routing protocols are covered as well as basic switching concepts. Students will learn how to configure industry standard networking equipment. Prerequisite: COMP1100 or COMP2100 (4 credits) fall, spring

COMP1150 ROUTING AND SWITCHING
This course introduces the students to routing, packet forwarding, and switching technologies. Both static routing and dynamic routing protocols are covered as well as basic switching concepts. Students will learn how to configure industry standard networking equipment. Prerequisite: COMP1100 or COMP2100 (4 credits) fall, spring

COMP1200 COMPUTER ORGANIZATION
This course covers binary number and codes, logic elements, combinational and sequential logic, architectural design of a computer using these elements, and introduces concepts such as process and memory management. Prerequisite: COMP1000; Corequisite: MATH2300 (4 credits) fall, spring

COMP2000 DATA STRUCTURES
This course is an introduction to the analysis and implementation of data structures. Topics include bags, sets, lists, queues, trees, maps, recursion, sorting and searching. Prerequisites: COMP1050 and MATH2300 (4 credits) fall, spring

COMP2100 NETWORK PROGRAMMING
This course provides an overview of how modern systems communicate over the Internet. An emphasis is placed on application programming interfaces common to all forms of network programming. Students will gain practical experience with several operating systems and network protocols relevant to computing. Prerequisite: COMP1050 (4 credits) fall, spring

COMP2150 NETWORK ADMINISTRATION
Modern enterprise and business systems rely on a stable network and server infrastructure to function. This includes many network protocols and services that are required in any network operations environment. Students in this course will configure and manage these critical services in their own virtualized environment following best practices and standards from the operations community. Prerequisite: COMP1150 (4 credits) spring
COMP2160 WIRELESS NETWORKS
This course will give introduction to the state of the art wireless and mobile networks. This course will cover the fundamental principles, architectures, and standards of modern wireless communication systems, including their applications and uses. **Prerequisite:** COMP1100 or COMP2100 (4 credits) spring

COMP2350 ALGORITHMS
This course introduces algorithmic design and analysis: students assess the complexity of algorithms in terms of time and space requirements for large input sizes. Topics include searching, sorting, pattern matching, hashing and encryption. **Prerequisites:** COMP1050 and MATH2300 (4 credits) fall, spring

COMP2499 SYSTEM ANALYSIS & BUSINESS APPLICATIONS
This course covers the principle analysis, design and implementation methodologies, and tools to develop business applications using the system development life cycle (SDLC). Students will gain experience in the analysis, design, and development of business applications via a series of case studies. (4 credits)

COMP2500 SECURITY PRINCIPLES
The course introduces computer and network security concepts and techniques. Theoretical concepts of security are examined as well as implementing system and network security. **Prerequisite:** COMP1100 or COMP2100 (4 credits) fall

COMP2650 DATABASES
Concepts and methods for the design, creation, querying, and management of relational database management systems. Covers modeling the conceptual and logical organization of databases, including the entity-relationship model; the relational data model and SQL; as well as functional dependencies and normal forms. Students will further strengthen their database skills by developing a substantial project with a team. **Prerequisite:** COMP1050; MATH2300 or MATH2800 (4 credits) fall

COMP3100 SYSTEM ADMINISTRATION
System administration is the practice of installing, configuring, and maintaining a computing system. This course provides students an overview of these and related concepts as well as the skills required to become an entry-level system administrator. In particular, topics covered include files systems, process control, access control, account management, software management, and scripting. **Prerequisite:** COMP1000; COMP1100 or COMP2100 (4 credits) fall

COMP3125 DATA SCIENCE FUNDAMENTALS
The aim of this course is to provide the fundamental knowledge and skills commonly required to solve data-driven problems. The course introduces computational and inferential approaches using set off skills that are cross-disciplinary. The course will train well-rounded professionals who can provide quantitative analysis, gather and analyze (big) data, and interpret and share results in a meaningful way. **Prerequisites:** COMP1000 or ELEC3150; and MATH1030 or MATH2100 (4 credits)

COMP3200 ASSEMBLY LANGUAGE
An advanced course in assembly language, including data representation, data storage, arithmetic, control flow, stacks and procedures, integer and character I/O, encryption, and applications to embedded computing. **Prerequisites:** COMP1200, COMP2000 and COMP2350 (4 credits)

COMP3350 PROGRAMMING LANGUAGES
An introduction to programming language concepts, including language evaluation criteria, context free grammars, parse trees, syntax diagrams, symbol tables, data types, control structure, and language translators. **Prerequisite:** COMP2000 and COMP2350 (4 credits) summer

COMP3400 OPERATING SYSTEMS
In this comprehensive course, we will study the basic facilities provided by the Operating System. Students will cover the functions of operating systems, including process management (processes, threads, context switch, concurrency control, synchronization, scheduling, deadlocks, etc.), primary memory management, virtual memory management, file systems, resource allocation, and information protection. **Prerequisites:** COMP2000 and COMP2350 (4 credits) fall

COMP3450 PARALLEL COMPUTING AND DISTRIBUTED COMPUTING
This course covers topics related to parallel and distributed computing, including parallel and distributed architectures and systems, parallel and distributed programming paradigms, parallel algorithms, and applications of parallel and distributed computing. **Prerequisites:** COMP2000 and COMP2350 and COMP2100 (4 credits) summer

COMP3499 OPERATING SYSTEMS FOR ENGINEERS
This course covers the functions and organization of operating systems, including process management, input/output systems, memory management, resource allocation, data management, and information protection. **Prerequisite:** ELEC2850 (4 credits) spring

COMP3500 NETWORK SECURITY
This course covers all aspects of securing and protecting a local area network from threats and vulnerabilities. Students will configure, test, and validate standard network services and devices at all layers of the network. **Prerequisites:** COMP2150 and COMP2500 (4 credits) fall

COMP3550 COMPUTER SECURITY
This course covers all aspects of securing and protecting a computer system from threats and vulnerabilities. Topics include password hashing and protection, virus detection, server security hardening, and application software protection. **Prerequisites:** COMP2500 and COMP3100 (4 credits) summer

COMP3575 SCRIPTING FOR CYBERSECURITY AND FORENSICS
Cybersecurity and forensics are part of an ever-changing field of computing and all other things "cyber". This course intends to examine many of the challenges and current problems that exist within these fields. Specifically, this course will provide an overview of the distinct challenges that cybersecurity professionals and forensic investigators face, identify the appropriate platforms for tools to be created that resolve or remediate some of those challenges, and ensure that integrity of evidence is maintained for appropriate post-event actions. Existing and emerging research in the field of cybersecurity, digital forensics, law, human factors will be examined. **Prerequisites:** COMP3100 or COMP3400 (4 credits)

COMP3580 DIGITAL FORENSICS
This course introduces the fundamentals of digital forensics and analysis of crime scenes that may involve computers, cell phones, and other digital devices. Formal methodologies, frameworks, processes and procedures for conducting digital forensic investigations are discussed in detail. Distinctions between Digital Forensics, eDiscover, and Incidence Response processes are explained. Relevant laws, regulations, and governance requirements dealing the different aspects of forensic investigations are examined as well. **Prerequisites:** COMP3100 or COMP3400 (4 credits)
COMP3590  APPLIED CRYPTOGRAPHY
This course is an introduction to the basic theory and practice application of cryptographic techniques used in modern information security systems. Cryptography provides important tools for ensuring the privacy, authenticity, confidentiality, an integrity of data involved in modern information systems, and frames the approach used in this course. This course examines the progress from historical symmetric encryption standards and protocols to the modern public key encryption processes. Basic concepts of ciphers, blocks, hashes, MACs, and key rotation strategies are discussed. Different implementation approaches are presented along with their performance impacts, along with potential attack strategies and their efficacy are discussed. **Prerequisites:** COMP3100 or COMP3400 (4 credits)

COMP3660  MOBILE APP DEVELOPMENT
This course is an introduction to mobile application development. It focuses on the creation of software systems for mobile devices. Topics include: platform introduction, environment setup, version control system, system prototyping, project structure and resources, application lifecycle, UI components, system services, sensors, security and permissions, data storage, testing and debugging, and application deployment. **Prerequisite:** COMP1050 (4 credits)

COMP3672  INTRODUCTION TO BIOINFOMATIC
This course introduces software tools used in biology for gene sequencing, pattern matching, etc. Tools may include database, data mining, statistical analysis, algorithms and visualization. (4 credits)

COMP3750  INTRODUCTION TO BIOSTATISTICS
This course covers practical applications of descriptive and inferential statistics with an emphasis on principles and methods of summarizing biological data using statistical software package. **Prerequisites:** COMP1000 and MATH2100 (4 credits) summer

COMP3800  SPECIAL TOPICS IN COMPUTER NETWORKING OR COMPUTER SCIENCE
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (4 credits)

COMP4050  MACHINE LEARNING
Introduction to the field of machine learning. This course focuses on algorithms to help identify patterns in data and predict or generalize rules from these patterns. Topics include supervised learning (parametric/ non-parametric algorithms, kernels, support vector machines), model selection, and applications (such as speech and handwriting recognition, medical imaging, and drug discovery). Students who have basic programming skills and who have taken a course in probability are encouraged to take this course. **Prerequisite:** MATH2100 and COMP1000 (4 credits)

COMP4150  ADVANCED SYSTEM ADMINISTRATION
This course is a follow-on course to System Administration that dives deeper into system and network environments found in modern enterprises. Students will build fully functional virtual networks, configure shared storage, deploy network account systems, utilize configuration management tools, monitor system health and set up a variety of standard applications. Scripting is used throughout the course to solve problems and automate common tasks. **Prerequisites:** COMP3100 (4 credits)

COMP4450  SYSTEMS PROGRAMMING
Systems programming involves writing software that is intended to interact with the Operating System rather than with the user directly. This course covers UNIX/Linux systems programming including system calls, file I/O, memory management, processes, threading, and other related topics. Students will rewrite fundamental parts of the UNIX/Linux userspace. **Prerequisite:** COMP3400 (4 credits)

COMP4460  COMPILERS
This course covers the principles and techniques used in the design of compilers. Compilers are the programs that translate code written in higher level languages into executable code. Topics include lexical and semantic analysis, transition, code generation and optimization. **Prerequisite:** COMP3350 (4 credits)

COMP4500  OFFENSIVE SECURITY
This course identifies the tools, techniques, strategies, and motivations of system intruders. In doing so, this course provides students with the skills necessary to ethically search, identify, and perform active assessment of enterprise systems, typically called penetration testing. Thus, students are able to preemptively identify the mechanisms by which attacks are perpetrated and the methods by which they can be prevented, defended or remediates. The hands-on activities will be based on environment(s) that minimize risk, and possible legal, ethical or network availability issues. **Prerequisites:** COMP3500 (4 credits) spring

COMP4550  INCIDENT RESPONSE & BUSINESS CONTINUITY
This course covers the process and implementation of incident response plans that adhere to appropriate business continuity plans. Students will design, implement, and test incident response processes for a variety of scenarios to ensure that the recovery time of their systems is within the limits specified in a continuity plan for an organization. Different incident response strategies, such as SAN Picerl, Lockheed Cyber Kill Chain, MITRE ATT&CK, etc. will be investigated. The tools, techniques and methodologies for enacting the incident response plan, processes, and procedures will be utilized. Critical documents such as Disaster Recovery Plan, Business Impact Analysis Plan, and Business Continuity Plans will be analyzed, developed and assessed. **Prerequisites:** COMP4500 (4 credits) summer

COMP4580  NETWORK FORENSICS
Network forensics is the intersection of network and communication principles, security, investigative processes, and the law. This course examines many different types of network protocols and technologies as the foundation of criminal or civil investigations. Critical concepts, such as forensic models, chain of custody, Daubert criteria, and verification and validation, are presented, discussed, and experienced through performing and replicating network forensics investigations. Different acquisition approaches and systems are identified and utilized. Existing and emerging research in the field of network forensics will be introduced as required readings. **Prerequisites:** COMP3100 or COMP3400 (4 credits)

COMP4650  WEB DEVELOPMENT
In-depth project-oriented work in modern web development including page organization, interactive databases, responsive design, security, and client and server side scripting. Students will create robust, effective, and secure web applications. **Prerequisite:** COMP2650 (4 credits) spring

COMP4700  ARTIFICIAL INTELLIGENCE
This course introduces the philosophical foundations of the underlying techniques involved with the design and implementation of intelligent computer systems. Topics include problem-solving via search, knowledge representation, reasoning in deterministic and stochastic tasks, as well as learning. **Prerequisites:** COMP2000 and COMP2350 and MATH2100 and MATH2860 (4 credits)
COMP4750 EMBEDDED ARTIFICIAL INTELLIGENCE
This course covers artificial intelligence algorithms that can be ported to embedded systems. The course can be divided into four categories: background materials, embedded systems, artificial intelligence (AI), and the final project. Prerequisite: COMP3125 (4 credits)

COMP4775 ADVANCED PARALLEL COMPUTING
This course will expand the fundamental concepts related to parallel and distributed computing. This includes the examination of multicore and manycore architectures, methods for solving real-world problems on massively distributed systems and performance analysis of parallel algorithms. Prerequisites: COMP3450 (4 credits) spring

COMP4950 PROJECT MANAGEMENT
This course provides students with a detailed understanding of the Systems Development Life Cycle (SDLC) and the methodologies to manage computing, networking, and security projects. Prerequisite: COMP2650 (4 credits) spring

COMP4950 SOFTWARE ENGINEERING
This course presents a formal approach to state-of-the-art techniques in software design and development. Students work in teams on an externally collaborative software projects. Prerequisites: COMP2000, COMP2350, and COMP2650 (4 credits) spring

COMP5500 SENIOR PROJECT
This course provides the opportunity for students to participate in design and implementation of solutions to large project in a team-based environment. Projects will in general be interdisciplinary in nature. Students will be required to provide written documentation and give oral presentations about their projects. The projects will be chosen in conjunction with the instructor for the course. Prerequisites: COMP4950 or COMP4960 (4 credits) summer

COMP5750 EMBEDDED ARTIFICIAL INTELLIGENCE
This course covers artificial intelligence algorithms that can be ported to embedded systems. The course can be divided into four categories: background materials, embedded systems, artificial intelligence (AI), and the final project. (4 credits)

COMP5775 ADVANCED PARALLEL COMPUTING
This course will expand the fundamental concepts related to parallel and distributed computing. This includes the examination of multicore and manycore architectures, methods for solving real-world problems on massively distributed systems and performance analysis of parallel algorithms. (4 credits) spring

COMP7000 FOUNDATIONS OF COMPUTER SCIENCE
This course recaps foundational material covered in typical undergraduate degrees. Topics covered may include computer science theory, computability and complexity, computer organization and architecture, operating systems, and data communications. (3 credits) fall

COMP7050 PROGRAMMING PARADIGMS & SYSTEMS
This course looks at the four main programming paradigms: imperative, functional, logic, and object-oriented. The paradigms are compared and students gain experience with each of them. The second half of the course looks at systems and the various techniques needed. These include parallel and distributed systems, real-time systems, and embedded systems. Prerequisite: COMP7000 (3 credits) fall

COMP7100 MANAGING SOFTWARE DEVELOPMENT
This course addresses the breadth of managing software development and is designed to help technically trained software engineers to acquire the knowledge and skills necessary to lead a project team, understand the relationship of software development to overall project engineering, estimate time and costs, and understand the software process. The nature of software development is sufficiently unique to require specialized management techniques, especially in the areas of estimating and scheduling. Prerequisite: COMP7050 (3 credits) spring

COMP7150 DATA SCIENCE & WEB SERVICES
Data Science and Web Services are provided through a service-oriented architecture (SOA) applied to data sourced from the internet. Web data services enable maximal mashup, reuse, and sharing of structured data (such as relational tables), semi-structured information (such as XML documents), and unstructured information (such as RSS feeds, content from web applications). Applications that can serve as a consumer or provider of web data services include mobile computing, web portals, enterprise portals, online business software, social media, and social networks. Prerequisite: COMP7050 (3 credits) spring

COMP7200 MOBILE APPLICATION DEVELOPMENT
Mobile Application development focuses on the creation of software systems targeting low-power handheld devices such as cell phones. This course examines the client-server model, considers various hardware configurations (e.g., screen size, hardware specifications) and user interface design. Security of mobile applications will be examined as devices such as smartphones become increasingly ubiquitous and owners store ever increasing amounts of personal information on them. Prerequisite: COMP7050 (3 credits) summer

COMP7250 ENTERPRISE COMPUTING
Enterprise computing refers to business oriented information technology that is critical to an organization's success. This course considers mainframe computing and compares it to distributed and cloud-based computing. It examines the architecture, operating system, application programming environment, networking, security and management of mainframe systems. Prerequisite: COMP7050 (3 credits) summer

COMP7300 COMPUTER SECURITY
Computer Security, also known as cybersecurity, is information security as applied to computers and mobile computational devices such as smartphones, as well as computer networks. The course examines the processes and mechanisms by which computer-based equipment, information and services are protected from unauthorized or unintended access, changes, or distribution; how threats are assessed and attacks are handled, and how analysis is undertaken to determine what information was lost or compromised as an attack took place. Prerequisite: COMP7050 (3 credits) fall

COMP7400 BIG DATA
Big Data is an all-encompassing term for any collection of data that is so large and complex that it becomes difficult to process using traditional data processing applications. The challenges include analysis, capture, classification, search, sharing, storage, transfer, visualization and privacy violations. Big Data is of interest to science, government, and the private sector as more and more data is collected daily. This course examines techniques to capture, manage, and manipulate large data sets. Prerequisite: COMP7050 (3 credits)
COMP7425 DATA MINING
Data mining is the analysis step in knowledge discovery in databases. It is an interdisciplinary field involving the computational process of discovering patterns in large data sets, and involves methods at the intersection of artificial intelligence, machine learning, statistics, and database systems. The overall goal of data mining is to extract information from large data sets and transform it into an understandable structure for future use. Topics examined in this course include the raw analysis step, addresses database and data management aspects, data preprocessing, model and inference considerations, metrics to determine how “interesting” a result is, complexity considerations, post processing of discovered structures, visualization, and online updating. Prerequisite: COMP7050 (3 credits)

COMP7450 SOFTWARE ENGINEERING
Software Engineering is the study and application of engineering to the design, development and maintenance of software. Topics covered include requirements engineering, software design, software construction, software testing, software maintenance, software configuration management, software engineering management, software engineering process, software engineering tools and methods and software quality management. Prerequisite: COMP7050 (3 credits)

COMP7500 CAPSTONE
The capstone experience brings together the material learned earlier in the Master’s programs. Students are guided by a faculty member to build a software system that integrates the knowledge they have learned and the skills developed throughout the program. Where possible, projects will be developed in collaboration with industry partners. Prerequisite: COMP7050 (3 credits) spring

COMP7800 GRADUATE SPECIAL TOPICS IN APPLIED COMPUTER SCIENCE
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of special topics course offerings. (4 credits)

Construction Management (CONM)

CONM1000 INTRODUCTION TO CONSTRUCTION MANAGEMENT, FACILITIES MANAGEMENT & REAL ESTATE DEVELOPMENT
This course provides an introduction to construction management and facilities management. The course will also explore the process of real estate development as it pertains to the built environment. The course will analyze the cultural context of construction, emphasizing its centrality in the evolution and expansion of the built environment. Industry trends, ethical considerations, delivery systems, technologies and recent "mega" projects including green construction and sustainability will be discussed. (3 credits) fall

CONM1200 BUILDING CONSTRUCTION
Survey of current materials and methods used in building construction, including building foundations; timber, concrete and steel framing systems; masonry construction; interior and exterior finishes. (4 credits) fall

CONM1500 CONSTRUCTION GRAPHICS
The development and interpretation of civil, architectural, structural, and electrical drawings; freehand sketching of construction details and sections; computer aided construction drafting. (3 credits) spring

CONM1600 HEAVY CONSTRUCTION EQUIPMENT
Study of current methods and equipment used in heavy construction projects, including highways, tunnels, bridges, dams, storm drains, and sanitary sewers. (3 credits) spring

CONM2000 CONSTRUCTION SURVEYING
Instruction is given in the theory and techniques of horizontal and vertical measurements. Laboratory exercises will focus on the application of these techniques as they relate to the building industry including construction layout and grades. Prerequisites: MATH1000 (4 credits) fall

CONM2100 STATICS & STRENGTH MATERIALS
This course covers the fundamental concepts of structural static; forces, moments, equilibrium, support conditions, and free body diagrams; and the fundamentals of strength of materials: properties, stress, strain, shear, bending, and torsion. Prerequisites: MATH1500 and PHYS1000 (4 credits) fall

CONM2200 ESTIMATING
Topics include the basic manual and computer-aided skills for estimating a variety of projects and developing takeoffs for all trades. Prerequisites: CONM1500 (4 credits) fall

CONM2500 BUILDING SYSTEMS
Building Systems is an introduction to the design, construction and start-up of building systems including mechanical, electrical and life safety systems. In particular, it covers the elements of these systems as they relate to the realm of the construction manager. The course provides basic design concepts and code requirements for a variety of systems, including: plumbing, heating, ventilation and air conditioning, fire protection, electrical distribution, lighting, low voltage, and building management control (BMS). It also provides information on systems testing and start-up. (4 credits) spring

CONM2600 WOOD & STEEL ANALYSIS & DESIGN
This course covers the properties of wood and steel products used in construction. The basic design principles for timber and steel structures are covered including connections, beams, columns, trusses, and frames. Prerequisite: CONM2100 (3 credits) fall

CONM3000 MATERIALS TESTING & QUALITY CONTROLS
Aggregate, concrete, asphalt, wood, and masonry are tested using ASTM procedures to establish design criteria, inspection and quality control programs. (4 credits) fall

CONM3100 CONSTRUCTION PROJECT MANAGEMENT
Topics include Construction Project Delivery Types, and Construction Project Management in the Pre-Construction, Construction and Post Construction Phases. Prerequisite: CONM2200 (4 credits) fall

CONM3201 CONSTRUCTION PROJECT SCHEDULING
Topics include project network planning, scheduling and cost control models. Computer applications for generating Gantt charts and CPM will be explored by students. Prerequisite: CONM1500 (4 credits) fall

CONM3500 ADVANCED ESTIMATING & BID ANALYSIS
Detailed cost estimates including quantity takeoffs, labor/material pricing, overhead/profit. Also, included are the preparation of preliminary budgets; factors affecting construction cost, bid strategies and computer applications are explored. Prerequisite: CONM2200 (4 credits) summer

CONM3600 CONCRETE ANALYSIS & DESIGN
This course covers topics related to the analysis and design of reinforced concrete structures including beams, columns, slabs, footings and retaining walls. Prerequisite: CONM2100 (4 credits) summer

CONM3800 SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (1 - 4 credits) summer
CONM4000 CONSTRUCTION PROJECT CONTROL
Examines the activities involved in the effective management of single and multiple construction projects including basic control theory, the preparation of control models, the collection of actual production data, and the corresponding computation of project performance. **Prerequisites:** CONM2200 and CONM3201 (3 credits) spring

CONM4100 CONSTRUCTION BUSINESS & FINANCE
Topics include construction financing during all phases of project development involving permanent loans, construction loans, sources of mortgage funds and venture capital, and tax and interest considerations. **Prerequisites:** MGMT2700 (4 credits) spring

CONM4200 CONSTRUCTION SAFETY & RISK MANAGEMENT
Topics include the knowledge and skills required to effectively manage safety compliance and risks associated with construction. This course satisfies the OSHA 30-hour training requirement for graduation. (3 credits) spring

CONM4650 BUSINESS, CONSTRUCTION LAW & GOVERNMENT REGULATIONS
This course introduces business law and relationships, construction contracts, and the contractual relationships commonly established between owner/real estate developer, designer, builder and construction manager. **Prerequisite:** Senior Status (3 credits) summer

CONM5500 SENIOR PROJECT CONSTRUCTION MANAGEMENT
Students have the opportunity to explore a subject in construction management of their own choice and to present it. A final oral presentation is required. **Prerequisite:** Completion of preceding 7 semesters of BSCM program and Senior status (4 credits) summer

CONM7000 EXECUTIVE MANAGEMENT FOR CONSTRUCTION MANAGEMENT
This course covers the management of a design and construction office and dealing with challenges of change, culture, diversity, portfolio management, project management, strategic management and other elements that influence the management process. This course also covers leadership, authority and decision making, and ethics concepts as systems-thinking ways of winning desired cooperation from associates, customers and the construction project participants. The use of case studies and analysis to develop a deeper understanding of executive management in a construction organization is emphasized. **Corequisite:** TCRM7000 (3 credits) fall

CONM7050 RESEARCH METHODOLOGY FOR CONSTRUCTION MANAGEMENT
This course will guide each student in the understanding and development of research, research tools, proposal writing, and research reports. Emphasis is placed on research planning and design. Topics to be covered range from the Review of Literature through qualitative and quantitative research methodologies. Special attention will be devoted to defining research problems in construction science or construction management and the development of research papers. Upon completion of this course, students will be able to: Demonstrate an understanding of the scientific approach to a research project; Demonstrate knowledge of the variety research tools used in scientific research; Examine "real world" construction science or management problems and develop research methodologies to define and understand them; Demonstrate knowledge of the available quantitative research methodologies; Demonstrate an understanding of how to write a research proposal; Specify the assumptions and limitations implicit in using these techniques, and explain the effect they have on the validity of the results obtained. (3 credits) spring

CONM7100 MODERN CONSTRUCTION DELIVERY METHODS
This course will expose students to current Architecture-Engineering-Construction (AEC) industry practices that are used to finance and manage the design and construction of capital facilities. It will investigate as well as differentiate recent trends in project contracting, organization, and production management. (3 credits) summer

CONM7200 CONSTRUCTION LAW
This course will provide a focused study of the key legal concepts and considerations encountered in the construction industry. The course shall include the student and analysis of: industry standard construction contract forms and documents, contractual relationships on a construction project, risk allocation among the parties to a construction project, the procurement and contract formation issues arising on construction projects (public v. private considerations), claims and changes (for time and compensation), and alternative dispute resolution. (3 credits) fall

CONM7250 CONFLICT RESOLUTION & NEGOTIATION FOR CONSTRUCTION MANAGEMENT
The course reviews the theoretical basis and practical application of traditional and evolving methods of dispute avoidance, mitigation and resolution within the construction industry. The class will cover key strategies, styles, and tactics involved in negotiating typical construction industry transactions, as well as alternative project delivery methods and partnering. The class will also address the negotiation of construction disputes and the resolution of disputes using third parties. Traditional litigation and all forms of alternative dispute resolution will be examined. (3 credits) Spring

CONM7300 REAL ESTATE DEVELOPMENT
Introduce elements, players and processes associated with real estate development. Emphasis placed on understanding the real estate development process from the perspective of each of the major players. Topics to be covered include the developer’s role, the relationship between owner/developer, architect and contractor, legal issues, and the perspective of lenders and investor partners. (3 credits) fall

CONM7400 ADVANCED PROJECT CONTROLS
This course covers the construction project controls necessary to be an effective project manager. Several key aspects of construction projects, such as construction contracts, cost estimation, planning and scheduling, equipment costs and productivity, construction control and monitoring, and risk management are discussed. (3 credits) spring

CONM7500 INTERNATIONAL CONSTRUCTION
A detailed introduction to the key elements of the international construction markets is covered, with emphasis on strategic elements having the most effect on project scopes, schedules and budgets. (3 credits) spring

CONM7800 GRADUATE SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (4 credits)

CONM8000 CAPSTONE PROJECT IN CONSTRUCTION MANAGEMENT
This course will guide each student in the development of an individual research topic. It integrates applied classroom and current industry practice and knowledge through observation and interpretation of realistic construction management issues. (3 credits) spring
CONM8900 CONSTRUCTION MANAGEMENT THESIS
The MS in Construction Management program offers an optional thesis for students who are considering doctoral-level study in the field. **Prerequisite:** CONM7050 (3 credits)

Cooperative Education (Co-op) (COOP)

COOP2500 CO-OP INSTITUTE
This interactive seven (7) week, non-credit seminar provides students the tools and framework needed to develop skills to successfully search for, accept, and complete a cooperative educational experience. Topics include but are not limited to Title VII of the Civil Rights Act of 1964, illegal workplace harassment. (0 credit) fall, spring.

COOP3000 PRE CO-OP WORK TERM
Cooperative education (co-op) aims to provide practical experience while applying classroom learning at a work site; to enhance professional skills; to experience personal growth. Co-op is a full-time work experience in a position related to your major. This course may not be used in lieu of COOP3500 or COOP4500 as a graduation requirement. **Prerequisite:** Successful completion of freshman and sophomore program requirements; 2.0 or higher cumulative GPA summer

COOP3500 COOP EDUCATION 1
Cooperative education (co-op) aims to provide practical experience while applying classroom learning at a work site; to enhance professional skills; to experience personal growth. Co-op is a full-time work experience in a position related to your major. Enrollment in this course maintains full-time student status. **Prerequisite:** Junior status; 2.0 or higher cumulative GPA

COOP4500 COOP EDUCATION 2
Cooperative education (co-op) aims to provide practical experience while applying classroom learning at a work site; to enhance professional skills; to experience personal growth. Co-op is a full-time work experience in a position related to your major. Enrollment in this course maintains full-time student status. **Prerequisite:** COOP3500; Senior status; 2.0 or higher cumulative GPA

COOP4699 COOP PROFESSIONAL DEVELOPMENT
This is an on-campus COOP experience that requires registration in 2.1 credit course unique to the on campus COOP. Student enrollment status in COOP4699 is less than full time. **Prerequisite:** at least Junior status; 2.0 or higher cumulative GPA

COOP5000 ADDITIONAL COOP WORK SEMESTER
Cooperative education (co-op) aims to provide practical experience while applying classroom learning at a work site; to enhance professional skills; to experience personal growth. Co-op is a full-time work experience in a position related to your major. Enrollment in this course maintains full-time student status. **Prerequisite:** COOP3500 and COOP4500; permission of the Director of CO-OPS + CAREERS; 2.0 or higher cumulative GPA

Design (DSGN)

DSGN1000 VISUALIZATION I/DRAWING I
Visualization I/Drawing I is an interdisciplinary course between the Industrial Design and Interior Design departments. Students create finished illustrations through observation, sketching and refining. Skills in hand-eye coordination, correct tool selection and use, and an application of linear perspective are developed to accurately and expressively record subjects from life, design and built environment. An emphasis on verbalizing work utilizing design nomenclature is stressed. (3 credits)

DSGN1010 DRAWING & THINKING FOR PRODUCT DEVELOPMENT
Primarily geared towards non-design majors, this course is focused on developing freehand drawing skills, the creative visual processing of ideas, and fundamental presentation techniques typical of the design practice and product development methodology. Course is open to all majors and levels of students. (3 credits)

DSGN1100 DESIGN MAGIC
This course is a jam-packed experience that introduces the first-year design student to the magic world of design creativity, the infinite possibilities in design, who’s doing it and what they’re doing, and how one gets creative magic. (2 credits)

DSGN1200 COLOR & COMPOSITION
This course investigates the properties and relationships of color, color systems and color interactions. Students relate theory to design through studio projects and explore its psychological and physiological effects on the environment. (4 credits)

DSGN3500 STUDY ABROAD EPIC STUDIO
The Study Abroad EPIC Interior/Industrial Design studio explores human scale and interaction in the interior built environment. Projects require solutions that simultaneously resolve theoretical, aesthetic and technical concerns, including the use of sustainable design methodologies. **Prerequisites:** INDS3000 or INTO3000 (6 credits)

DSGN3800 SPECIAL TOPICS IN DESIGN
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (1 - 4 credits)

Economics (ECON)

ECON1102 ECONOMICS I (CPCE)
This course is designed to enable the student to understand the functioning of the competitive market. The analysis of the production of goods and services and the method of allocation and distribution is emphasized. **Prerequisite:** ENGL1050 (3 credits)

ECON1300 MONEY AND BANKING (CPCE)
The course deals with the creation and uses of money and the role of banks. Fiscal and monetary policy, the role of the Federal Reserve, and both foreign and domestic banking policy will be studied. **Prerequisites:** ENGL1050 and ENGL2050 (3 credits)

ECON3200 INTERNATIONAL ECONOMICS (CPCE)
This course is a survey of the development of international trade theory and policy. Topics include: The organization and regulation of international trade, GATT, international economic integration, NAFTA, balance of payments and exchange rate determinations. **Prerequisites:** ENGL1050 and ENGL2050 (3 credits)

ECON3800 SPECIAL TOPICS IN ECONOMICS
Presents topics in economics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. **Prerequisite:** Completion of an English Sequence (4 credits)

ECON4102 PRINCIPLES OF ECONOMICS
This course covers the core theories and concepts of microeconomics and macroeconomics, with emphasis on how individuals, organizations, and public officials allocate scarce resources, and the impact of their policy choices on the growth and development of the economy. **Prerequisite:** completion of an English Sequence (4 credits) fall, spring, summer
ECON4152 MACROECONOMICS
An introduction to the functioning of market economics. National income determination, and the role of labor and capital in the determination of economic aggregates. Public and economic policy associated with unemployment and inflation, and fiscal and monetary policy. **Prerequisite:** Completion of an English Sequence (4 credits) fall, spring, summer

ECON4154 MICROECONOMICS
This course involves a study of the choices made by individuals and organizations in the allocation of scarce resources with emphasis on consumer demand and profit maximization of firms, the behavior of firms under conditions of competition, monopoly-monopoly and imperfect competition, and public policy issues related to the same. **Prerequisite:** Completion of an English Sequence (4 credits) fall, spring, summer

ECON4200 TECHNOLOGY & ECONOMIC DEVELOPMENT
This course focuses on the current challenges of the developing world and the technological advances which are improving lives and empowering the poor in terms of access to health care, clean water, nutritious food, sanitation, and communication technology. We will also consider the theoretical and historical relationship between technology and economic growth and development. By working with both interdisciplinary and external partners, students will develop their own proposals for new technologies designed to meet the needs of underdeveloped communities around the world. **Prerequisite:** Completion of an English Sequence (4 credits)

ECON4362 THE GLOBAL ECONOMY
This course will examine the global economic shifts which have precipitated regional and global economic integration and interdependence among the world’s economies. Topics include the role of international organizations, global corporations, and international flows of finance, information, technology and trade in shaping the scope, depth, and pace of economic growth and development in the international community. **Prerequisite:** Completion of an English Sequence (4 credits)

Electromechanical (ELMC)

ELMC2080 INTRODUCTION TO ROBOTIC SYSTEMS
This course introduces the fundamental principles of robotic systems. Students study both the hardware and software needed to design, build, program, and test a mobile robot. Topics include power sources, motors, sensors, actuators, and process controls. Laboratory work complements classroom discussion. **Prerequisite:** MATH1500 or MATH1750 or MATH1775 (3 credits)

ELMC3000 ELECTROMECHANICAL DESIGN
Students work in teams to design and construct an interdisciplinary project. Teams, with clearly defined individual responsibilities, are required. During the course of the semester, each team undertakes the necessary activities to bring about a successful design project that is well understood, documented, and presented in both oral and written form. Emphasis is placed on research, innovation, project management, decision-making, prototyping, design for manufacturing, design for testability, environmental and ethical issues in design, depth and breadth of analysis, quality of hardware, documentation, and communications. **Prerequisites:** Junior status, ENGR1500 and MECH2500 and ELEC3250 (3 credits)

ELMC3250 ELECTROMAGNETIC FIELD THEORY
This course introduces static electric and magnetic fields. Time-varying fields are studied using Maxwell’s equations. Application of energy transfer in space and in communication transmission lines are analyzed. **Prerequisite:** MATH2025 (3 credits)

ELMC3800 SPECIAL TOPICS ELECTROMECHANICAL ENGINEERING
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (1 - 4 credits)

ELMC4000 ADVANCED MATHEMATICAL MODELING
Problems in heat transfer, fluid mechanics, vibration systems, and wave propagation will be modeled using partial differential equations. Solution techniques will involve the study of orthogonal expansions in Fourier series, Sturm-Liouville theory, and the method of separation of variables. Additional problems in heat conduction will be presented and solved using Bessel functions and cylindrical coordinates. Computer software for both modeling and problem solving will be employed. **Prerequisite:** MATH2500 (3 credits)

ELMC5000 SENIOR DESIGN I
Students will work in the electrical and mechanical fields alone and in small project groups to study, analyze, design, and sometimes build and test concepts in a field of their choosing. The study will be performed under the direction of one or more faculty advisors. Projects from industry will be encouraged to increase the interaction and cooperation with local engineering firms. Course requirements include regular, oral, and written progress reports throughout the semester. The final technical report will detail the plans and schedule for the following Senior Design II course. **Prerequisites:** ELEC4475 and MECH4400 and MECH4425 (4 credits)

ELMC5005 ELECTROMECHANICAL SYSTEMS I
This course analyzes the dynamic behavior of mechanical, fluid and thermal systems using modeling and simulation techniques. Steady state and transient conditions will be examined in both free and forced modes. Various simulation software packages are used in the laboratory to analyze electromechanical systems. **Prerequisites:** ELEC4475 and MATH2860 and MECH3850 (4 credits)

ELMC5500 SENIOR DESIGN II
This course is a continuation of Senior Design I. The students continue with their design and analysis with emphasis on improvements and applications. Other faculty and local engineers will review the student work and make recommendations. **Prerequisites:** MATH2100 and ELMC5000 and ELMC5505 (4 credits)

ELMC5505 ELECTROMECHANICAL SYSTEMS II
This course is a continuation of Electromechanical Systems I. Analysis of multi-degree of freedom systems will be studied. Dynamic responses of first and second order systems to harmonic excitation are analyzed. State space analysis will be used to solve sets of n-th order coupled differential equations. Sensors to detect displacement, velocity, and acceleration as well as digital signal processing techniques to acquire data, provide filtering, and perform system analysis will be employed. The laboratory projects will reinforce the theory and demonstrate the rigor of the analytical techniques. Laboratory exercises will stress the comparison of theoretical and simulated results. **Prerequisite:** ELMC5505 (4 credits)

Electronics (ELEC)

ELEC1000 INTRODUCTION TO ENGINEERING AND TECHNOLOGY
This initial course introduces technology concepts and engineering drawing. Students will learn about basic systems, get an overview of their major, and become acquainted with the skill sets they will need to be successful in their field. **Prerequisite:** Enrollment in BCOT or BEET program (4 credits)
**ELEC1100 CIRCUIT THEORY I**
The concepts of current, voltage, power, energy, and resistance are studied. Topics include DC and AC sources, capacitance, inductance, and magnetism. Resistive circuits are analyzed using Ohm's and Kirchhoff's Laws and computer-aided circuit analysis using SPICE is included. **Prerequisite:** MATH1000 or MATH1035 (4 credits)

**ELEC1500 CIRCUIT THEORY II**
The concepts of impedance and admittance in sinusoidal circuits are examined. Circuits are solved using superposition, Thévenin, Norton, nodal, and mesh analysis. Resonant circuits and transformer theory are also studied. Laboratory work and computer-aided analysis techniques are designed to correlate with theory. **Prerequisite:** ELEC1100; **Corequisite:** MATH1500 (4 credits)

**ELEC2000 SEMICONDUCTOR DEVICES**
A variety of semiconductor devices are introduced. Emphasis is placed on diodes, BJTs, oscillators and FET. A variety of applications including triacs, SCRs, optoisolators, and other devices are also included. **Prerequisite:** ELEC1500; **Corequisite:** MATH1700 (4 credits)

**ELEC2100 LOGIC CIRCUITS**
This course introduces the Boolean algebra, combination logic circuits, counters, registers, ALUs, encoders, decoders and multiplexer. Circuit simulation software is used in laboratory work. **Prerequisite:** ELEC1100 (4 credits)

**ELEC2250 NETWORK THEORY I**
The fundamental concepts of current, voltage, and power are studied along with the properties of passive circuit elements as well as network theorems. Transient analysis R-L, R-C, and R-L-C circuits and initial conditions are studied. Laboratory experiments parallel classroom theory and include circuit simulation. **Prerequisite:** MATH1850 or MATH1875; **Corequisite:** MATH2500 (4 credits)

**ELEC2275 DIGITAL LOGIC**
This course introduces digital logic and circuits. Topics include continuous and discrete number representations, binary arithmetic, combinational logic (Boolean algebra, truth tables, Karnaugh maps, encoders, decoders, multiplexer), sequential logic (flip-flops, timing diagrams, counters, registers, state machines, memory), integrated circuit issues (operating characteristics, logic voltage levels, propagation delay, fan-out), power dissipation and programmable logic devices. Digital circuits are implemented and tested utilizing both schematic diagram representation and hardware description language (HDL). **Corequisite:** ELEC22250 (4 credits)

**ELEC2299 ELECTRICAL CIRCUIT ANALYSIS & DESIGN**
Basic electric circuit theory is covered, including direct current (DC), transient, and alternating current (AC) steady state analysis. Specific topics include the concepts of current, voltage, resistance, capacitance, inductance, impedance, power, energy, power factor, Ohm's Law, series and parallel circuits, Kirchhoff's Laws, nodal analysis, mesh analysis, Superposition Theorem, Thévenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem, Phasor diagrams, and introduction to the Laplace Transform in circuit analysis. Laboratory work and computer-aided analysis techniques are designed to correlate with circuit analysis theory and design. **Corequisites:** MATH1850 and PHYS1750 (4 credits)

**ELEC2499 LOGIC CIRCUITS**
This course introduces binary and hexadecimal numbers, Boolean algebra, truth tables, Karnaugh maps, and combination logic using basic gates. Flip-flops, counters, registers, ALU's, encoders, and decoders are also presented. Circuit simulation software is used in both classroom and laboratory work. **Prerequisite:** ELEC1100 (4 credits)

**ELEC2599 INTRODUCTION TO MICROPROCESSORS**
This course introduces microprocessors and microcomputer systems. Related hardware and software issues will be covered. It will also cover memory systems, input/output devices, and interfacing mechanisms. **Prerequisite:** ELEC2499 (4 credits)

**ELEC2600 DIGITAL APPLICATIONS**
This course covers the analysis and modeling of high-speed digital systems. It examines the use of programmable CMOS integrated circuits. The student will learn to implement both combination and sequential logic circuits in addition finite state machines. **Prerequisite:** ELEC1500 and ELEC2100; **Corequisite:** MATH1800 (4 credits)

**ELEC2699 INTEGRATED ELECTRONICS**
This integrated electronics course covers basic analog and digital electronic circuits and devices. The topics include diodes, MOSFETs, FETs, BJTs, operational amplifiers, inverting, non-inverting, integrating, and differentiating op-amps, bioinstrumentation amplifiers, filters, oscillators and signal generators, digital logic, Boolean algebra, Karnaugh maps, logica gates, flip-flops, programmable logic devices, encoders, decoders, counters, registers and A to D converters. Lab experiments will include basic analog and digital devices, practical biomedical applications, and a design project. **Prerequisite:** ELEC2299 (3 credits)

**ELEC2700 INTEGRATED CIRCUITS WITH APPLICATIONS**
Integrated circuit applications of operational amplifiers and linear integrated circuits are introduced. Topics include the use of linear and non-linear IC's in open and closed loop (feedback) configurations. **Prerequisite:** ELEC2000; **Corequisite:** MATH1800 (4 credits)

**ELEC2750 NETWORK THEORY II**
In this continuation of Network Theory I, the concept of complex impedance and admittance is included. Circuits are analyzed using network theorems. Magnetic circuits, transformer concepts and AC power are studied in addition to three-phase balanced circuits. The Laplace Transform analysis and its application to circuit analysis are also studied. **Prerequisites:** ELEC2250 and MATH2500 (4 credits)

**ELEC2799 CIRCUIT THEORY AND APPLICATION**
Introduction to electrical and electronic circuits, with emphasis on building a foundation for applications involving mechanical systems. Voltage, current and power will be analyzed in DC and AC circuits having components that include resistors, capacitors, inductors, diodes or operational amplifiers. Some of the laboratory exercises will involve applications having sensors of mechanical phenomenon, signal conditioning , data acquisition and basic signal processing on a computer running suitable software. Some of the homework and laboratory exercises will involve building and testing circuits using circuit simulation software. **Prerequisites:** MATH1750 and PHYS1750 (3 credits)

**ELEC2850 MICROCONTROLLERS USING C PROGRAMS**
Students learn to develop both computer programs and microcontroller systems. Based on the C language, fundamental programming concepts are explored, including types, operators (Boolean, binary, numeric), expressions, control flow, functions, pointers, arrays, structures and input/output mechanisms. Microcontroller concepts are explored, including hardware architecture, programming model, timers, interrupts, data acquisition, signal output and serial communication. Peripheral circuits for microcontrollers are developed for signal conditioning of sensor input and for controlling of actuators. **Prerequisite:** ELEC2275 (4 credits)
ELEC2950  EMBEDDED COMPUTER SYSTEMS
Students will design embedded data acquisition systems to monitor and record data from a variety of electromechanical systems. This course includes the study and use of sensors for measurement of physical parameters, signal conditioning for input interfacing, semiconductor devices for output control. Both hardware and software designs are implemented to solve a variety of engineering applications. **Prerequisite:** ELEC2275 (3 credits)

ELEC3000  OBJECT ORIENTED PROGRAMMING ELECTRONICS
This course is an introduction to object oriented programming topics useful for electronics. Topics include I/O file streams and data files, introduction to classes, class functions, and conversions. **Prerequisite:** ELEC2850 (4 credits)

ELEC3025  INTERNET OF THINGS
Explore technology and development for the internet of things (IoT), including the IoT aspects of 1) nodes of embedded processors connected to sensors or actuators, 2) communication between nodes, gateways and the cloud using communication protocols, and 3) cloud for data storage and analytics. **Prerequisite:** ENGR1800; **Corequisite:** ELEC2275 or ELEC2299 or ELEC2799 or BIOE2500 (4 credits)

ELEC3100  DATA COMMUNICATIONS
This course introduces the concepts of digital transmission, metallic cable and fiber transmission media, transmission lines, public telephone network and data communications. **Prerequisite:** ELEC2100 (4 credits)

ELEC3150  OBJECT ORIENTED PROGRAMMING FOR ENGINEERS
This course introduces students to a set of tools and methods that enables engineers to build reliable, user-friendly, maintainable, well documented, reusable software systems. This course teaches these fundamental ideas through the object-oriented approach to programming using C++ and Java. **Prerequisite:** ELEC2850 (4 credits)

ELEC3160  DIGITAL IMAGE PROCESSING
This course introduces the student to digital image processing. Topics considered are image capture, computer processing of digital images, and display. Applications include image enhancement, noise filtering, special effects, edge detection algorithms, compression methods like JPEG, and image analysis. Laboratory and class work demonstrate some of the underlying mathematical principles including transform techniques like FFT, DCT, Haar and wavelets. **Prerequisite:** MATH1500 (3 credits)

ELEC3200  ADVANCED DIGITAL CIRCUIT DESIGN
Students learn the approach to designing complex digital systems described using schematic entry or hardware description languages. Circuits are synthesized, simulated and tested on programmable logic hardware circuits. **Prerequisite:** ELEC2275 (4 credits)

ELEC3225  APPLIED PROGRAMMING CONCEPTS
This course will introduce engineers to applied programming concepts and large-scale programming projects. Topics include design patterns, data structures, database management, advanced user's interfaces, algorithm design, and version control and regression testing. The course will focus on hands-on programming, with both small and large projects. **Prerequisites:** ELEC3150 or instructor permission (3 credits) summer

ELEC3250  ANALOG CIRCUIT DESIGN
This course covers the concepts of design, analysis, simulation, implementation and evaluation of analog electronic circuits and systems. Topics include semiconductor physics, BJT, MOS, and FET devices and linear integrated circuits. **Prerequisite:** ELEC2750 (4 credits)

ELEC3300  ELECTRIC MACHINES & TRANSFORMERS
This course concentrates on single-phase and three-phase systems, magnetic systems, transformers, electromechanical conversion principles, three-phase and single-phase induction motors, synchronous motors and generators, DC generators and motors, and stepper motors as applied to electric power and control systems. Laboratory work parallels classroom theory. **Prerequisite:** ELEC1500 (4 credits)

ELEC3350  SOLID STATE DEVICES
The primary goal of this course is to provide students with the essential background on semiconductor materials and devices including a basic understanding of crystal structure, energy bands, charge carriers and junctions. **Prerequisites:** ELEC3250 and MATH2025 (3 credits)

ELEC3450  MICROCONTROLLERS & EMBEDDED COMMUNICATION
This course will introduce the students to microcontroller principles, both hardware and software. Students will write assembly language programs using programming techniques and use sensor signal conditioning for interfacing and software design. **Prerequisite:** ELEC2100 (4 credits)

ELEC3500  ELECTRONICS II
This course, the second in a two-course sequence, covers the concepts of design, analysis, simulation, implementation and evaluation of electronic circuits and systems. Topics include diodes, MOSFETs, BJTs, building blocks of integrated circuit amplifiers, differential and multi-stage amplifiers, and output stages and power amplifiers. **Prerequisites:** ELEC3350 (4 credits)

ELEC3550  COMPUTER NETWORKS FOR ENGINEERS
This course focuses on the Internet and a modern treatment of computer networking. Topics include network services, application, transport and network layers, local area networks, wireless and mobile networks, multimedia networking and network security. **Prerequisite:** ELEC3150; **Corequisite:** ELEC3725 (4 credits)

ELEC3575  COMPUTER COMMUNICATION & NETWORK
This course covers local (LAN), metropolitan (MAN) and wide area (WAN) networks, topologies and transmission media, network interface and management, congestion/flow/error control, routing and addressing. Laboratory exercises include simulation and installation of small network. **Prerequisite:** ELEC3100 (4 credits)

ELEC3600  SIGNALS AND SYSTEMS
This course introduces students to signals and systems and to linear algebra. Topics include: matrix operations, determinants, vector spaces, linear transformations, orthogonality, eigenvalues, signal operations, classifications of signals and systems, continuous-time LTI system analysis (impulse response, convolution, Laplace transform and its applications), continuous-time signal analysis (Fourier series, Fourier transform and its applications). **Prerequisites:** MATH2025 and MATH2500 (4 credits)

ELEC3650  EMBEDDED SENSOR NETWORK
This course focuses on the embedded processor nodes with sensors and actuators that are on the edge of the Internet of Things (IoT), interacting with the physical world. Theory and methods of IoT, microcontrollers, electronic interfaces, sensor input, actuator output, and communication to other embedded nodes, gateways and the cloud are investigated. Students develop systems by programming software and assembling hardware components for IoT applications. **Prerequisite:** ELEC3025 (4 credits)
ELEC3725 LINEAR NETWORK ANALYSIS
This course introduces first and second order differential equations, initial condition problems, Laplace Transforms with partial fraction expansion, pole/zero analysis, and Fourier Transforms. Associated laboratory experiments parallel the theory and help demonstrate the practical usefulness of the topics as they apply to electronic and computer engineering technology problems. Prerequisite: MATH2000 (4 credits)

ELEC3725 COMPUTER ARCHITECTURE
This course introduces engineering students with the design of computer systems and components; processor design, instruction set design, and addressing; control structures and microprogramming; memory management, caches, and memory hierarchy; interrupts and I/O structures. Prerequisite: ELEC2275; Corequisite: ELEC3550 (3 credits)

ELEC3750 COMPUTER SYSTEMS ARCHITECTURE
This course examines the operation of a computer system including microprocessor, I/O, mass storage, monitors, and memory. Introduces machine language and compilers as applied to current and state-of-the-art systems. Interfacing with stepper motors and sensors are also introduced. Prerequisite: ELEC2120 (4 credits)

ELEC3775 DISCRETE SIGNALS & SYSTEMS
Discrete signals and systems are identified and studied. The use of difference equations, convolution techniques, and z-transforms are included. The need for anti-aliasing filters, sample-and-hold circuitry as well as limitations of ADCs are emphasized. Laboratory exercises address practical solutions to problems. Prerequisite: Junior status; Corequisite: ELEC3675 (4 credits)

ELEC3800 SPECIAL TOPICS IN ELECTRONICS
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (1 - 4 credits)

ELEC3900 INTRODUCTION TO NANOTECHNOLOGY
The ongoing impact of nanotechnology on the current state of science and engineering will be explored here. Various deposition techniques and applications are also studied. (3 credits)

ELEC3920 ENGINEERING SIGNALS & SYSTEMS
Continuous and discrete-time signals and systems will be studied. Time domain analysis of linear systems will include convolution (discrete and continuous), time-invariance, causality, and stability of systems. Time domain analysis of signals using the Fourier series and Fourier integral will be covered as well as frequency domain analysis of signals using the Fourier transform. Laplace transform analysis of linear systems including pole-zero plots and z-transform analysis of discrete systems will be studied. Laboratory exercises will use computer software to strengthen important course concepts. Prerequisite: ELEC2750 and MATH2500 (4 credits)

ELEC3950 ADVANCED SENSORS & INTERFACING SYSTEMS
Topics include linear and nonlinear sensors, high-performance instrumentation amplifiers for signal conditioning, temperature sensors, analog computational units with application of linear regression techniques, and design of multiplier circuits. Modern sensors and interfacing with microcontrollers are introduced. Prerequisite: ELEC2700 (4 credits)

ELEC4000 DIGITAL SIGNAL PROCESSING
This course presents the basic digital signal processing (DSP) principles used in the design and analysis of sampled signals. Topics include but are not limited to design of finite impulse response (FIR) filters and infinite impulse response (IIR) filters. The Fast Fourier Transform (FFT) is studied in order to compute the Discrete Fourier Transform (DFT). Laboratory experiments emphasize hardware and software solutions to practical problems. Prerequisites: ELEC3775 (4 credits)

ELEC4025 HARDWARE SECURITY
This course will introduce students to the hardware and related software aspects of modern computing devices. Students will learn about confidentiality, data integrity, availability, general methods of data/information protection, and study existing exploitations, in order to design more secure systems/devices. Students will also study the ethics of hacking and security. Prerequisites: ELEC2850 or instructor permission (3 credits) summer

ELEC4050 MOTORS AND CONTROLS
This course reviews the topic of magnetic, DC, AC (single and 3-phase) and special motors are considered. Applications of different types of motors will be discussed. Electromechanical control equipment as well as the solid state control equipment will be covered. The course will use the knowledge learned in previous courses in the curriculum to build a working model for a particular application. Prerequisites: ELEC3250 and MATH2025 (4 credits)

ELEC4075 ENGINEERING OPERATING SYSTEMS
Students will learn the fundamentals of operating systems concepts and architectures for various platforms such as personal computers, mobile, networked and real-time embedded systems. Coverage shall include operating systems architecture, concepts and methods for managing processes and threads, main memory, file systems, I/O management and real-time systems. Detailed examples are taken from several operating systems, emphasizing the techniques used in UNIX variants. Concepts and techniques will be demonstrated using lab experiments using UNIX-like system such as Linux or QNX. Prerequisite: ELEC3150 (4 credits) spring

ELEC4100 ELECTROMAGNETICS
Static electric and magnetic fields are studied in this course. Maxwell's equations are presented and time-varying fields are introduced. Laboratory applications include transmission of electromagnetic waves in air and on transmission lines. Prerequisite: MATH2000 (4 credits)

ELEC4200 DIGITAL CONTROL & SYSTEMS
This course will use velocity and position feedback to control servos. PID and other types of systems will be analyzed through software packages employing BODE, Nyquist and Root locus techniques. Prerequisite: ELEC3675; Corequisite: ELEC4225 (4 credits)

ELEC4225 INTRODUCTION TO DIGITAL SIGNAL PROCESS
This course introduces sampling, aliasing, ADCs and z-transforms. DSP applications including digital filtering (both FIR and IIR) are analyzed and designed. Fast Fourier Transform (FFT) is studied in order to compute the Discrete Fourier Transform (DFT). Laboratory experiments emphasize hardware and software solutions to practical problems. Prerequisites: ELEC3450 and ELEC3675 (4 credits)

ELEC4300 ENGINEERING COMMUNICATION SYSTEMS
This course serves as an introductory course in analog and digital communication systems. Topics covered include amplitude, frequency, pulse and pulse-code modulation and signal-to-noise ratios for various modulation schemes and sampling, quantization and coding. The laboratory would augment the course materials. Prerequisite: MATH2100 (4 credits)
ELEC4350 FEEDBACK CONTROL SYSTEMS
Analysis and design of linear control systems will be accomplished using Root locus, Bode and Nyquist techniques. The laboratory experiments will include servo trainers and employing 4 software packages. Digital systems will be introduced as well as state variables. PID controllers will be covered. Prerequisites: ELEC3675 and ELEC3775 (4 credits)

ELEC4400 ENGINEERING DIGITAL SIGNAL PROCESSING
This course presents the theory and practice of digital signal processing. Topics include review of discrete-time signals, systems and the Z-transform; sampling and quantization; Fourier transforms (DTFT, DFT and FFT) with applications to fast convolution; design techniques for FIR and IIR digital filters; realization structures for digital filters and finite precision effects; fundamentals of multirate signal processing and filter-banks; and DSP applications. Prerequisites: ELEC3600 and MATH2300 (4 credits)

ELEC4425 ADVANCED PROGRAMMABLE LOGIC
The objective of this course is to build a RISC processor core. The emphasis will be on implementing MSI circuits using VHDL language. Students utilize top-down methodology to design complex logic circuits using programmable logic abstractions. They synthesize hierarchical architecture structures in building a processor core. Prerequisites: ELEC2100 and ELEC3750 (3 credits)

ELEC4450 DIGITAL COMMUNICATION SYSTEMS
This course studies sampling, coding, decoding, pulse code modulation, digital multiplexing, digital carrier systems, frequency shift keying, data compression, as well as bandwidth considerations. Laboratory work parallels classroom theory. Prerequisite: ELEC3775 or ELEC4425 (4 credits)

ELEC4475 FEEDBACK AND CONTROL
The definition of an analog feedback control system will be the introduction of the course. The course proceeds with the time-domain and frequency-domain analysis of closed loop feedback control systems. The relationship between the time-domain and frequency-domain is discussed. The stability methods are explained. The course provides an introduction to the state-space method and an introduction to discrete control systems. Prerequisites: MATH2500; Corequisite: ELEC4050 (4 credits)

ELEC4500 ELECTRONICS DESIGN PROJECT I
The first of a two course sequence, this course concentrates on the selection of an appropriate engineering project for design, the development of time and financial budgets, and milestone graphs. The majority of work is spent in the laboratory researching, designing, prototyping, debugging, and acquiring data on the students’ individual designs. Engineering notebook is required. Prerequisites: ELEC3450 and ELEC3950; senior status (3 credits)

ELEC4725 ADVANCED COMPUTER ARCHITECTURE
We will discuss various concepts behind the designs of current microprocessors. In particular, the topics that will be covered in the course are but not limited to: performance simulators and evaluation, static and dynamic scheduling, instruction-level parallelism, advanced pipelining, speculative execution, memory hierarchy and organization, multi-processing. Prerequisite: ELEC3725 (3 credits) spring

ELEC5000 SENIOR DESIGN PROJECT I
This course is for BCOT senior students to pursue project-oriented work. Students may work in their curriculum or become involved in an interdisciplinary problem. Course requirements include oral and written progress reports throughout the semester plus a final technical report documenting the semester’s work. Prerequisite: Senior status (4 credits)

ELEC5500 SENIOR DESIGN PROJECT II
The second of a two course sequence, Senior Design Project II focuses on implementing the design developed in Senior Design Project I. Emphasis is placed on both oral and written presentation skills as well as packaging and fabrication of an "engineering prototype”. Prerequisites: ELEC4500 (3 credits)

Engineering (ENGR)

ENGR1000 INTRODUCTION TO ENGINEERING
This course develops the skills needed during the students study of engineering. Topics include task/time management, effective use of notes, engineering research, oral and written communications, problem-solving techniques, ethics and professional responsibility and Institute resources. In the laboratory, students work in teams to complete a variety of engineering tasks. (3 credits)

ENGR1500 INTRODUCTION TO ENGINEERING DESIGN
This course is an externally collaborative project based interdisciplinary design course, introducing students to the fundamentals of engineering design and professional practices. Students learn about the design cycle and the necessary steps to work on a successful design as a member of a team. Topics include problem identification, brainstorming, project planning, and design alternatives. Cost, safety and environmental issues are considered as well as ethical and professional responsibilities. Prerequisite: Enrollment in an engineering program (3 credits) spring

ENGR1600 FUNDAMENTALS OF CAD & CAM
Basic concepts of engineering graphics, design and sketching and computer programming, research methodologies, manufacturing fundamentals, along with basic measurements and presentation of experiment results. (1 credit)

ENGR1800 PROGRAMMING WITH MATLAB
This course is universal to all freshman engineering students. MATLAB is a powerful programming language used throughout many engineering industries. This course provides an introduction to the fundamentals of computer programming and the use of MATLAB. The student will be introduced to the 'Procedural Programming' paradigm and will learn the proper use of the logical building blocks common to all modern computing languages and how to create specific programs using the MATLAB syntax. After this introductory course the student is encouraged to continue to use and develop their MATLAB programming skills by utilizing MATLAB for their other courses. (1 credit) fall, spring

ENGR2000 BUILT ENVIRONMENT SUSTAINABILITY
This interdisciplinary course, open to all majors, introduces Sustainability concepts in the context of the built environment examining the various sectors: residential, commercial, industrial, and transportation through the lens of globally utilized sustainability rating systems. The course focuses on the Leadership in Energy and Environmental Design (LEED) certification and the sustainable developments goals of the United Nations to explore strategies to reduce resource consumption and design sustainable structures. The course focuses on key knowledge areas of sustainability theory and practice, life cycle cost analysis, life cycle analysis, value engineering, water efficiency, energy efficiency, indoor environmental quality, materials resources, innovation and regional priority, design resilience, certification of sustainable designs, LEED accredited professional self-certification and post occupancy evaluation of sustainable designs. (4 credits)
ENGR3500 ENGINEERING JUNIOR DESIGN
This engineering design course is for junior level engineering and
computer science students who will formulate a topic and develop a
design for an innovative device or system. Students are encouraged to
follow an interdisciplinary approach. **Prerequisite: Junior status in an
engineering or computer science program (4 credits)**

ENGR3800 SPECIAL TOPICS IN ENGINEERING
Presents topics that are not covered by existing courses and are likely
to change from semester to semester. Refer to the Class Schedule for a
specific semester for details of offerings for the semester. (1 - 4 credits)

ENGR5000 ENGINEERING SENIOR DESIGN I
In this first capstone course, engineering students will apply knowledge
and skills learned in their undergraduate engineering curriculum toward
a proposed project approved by the faculty advisor to study, analyze,
design, build and test concepts in a field of their choosing. Elements
of the design process are considered as well as real-world constraints,
such as economic and societal factors, marketability, ergonomics,
safety, aesthetics and ethics. **Prerequisite: senior standing; Corequisite:
MGMT3200 (4 credits) spring**

ENGR5500 ENGINEERING SENIOR DESIGN II
In this second capstone course, students will continue to work on their
project. The final prototype will be presented by engineering students to
meet initial specifications. **Prerequisite: ENGR5000 (4 credits)**

**English (ENGL)**

ENGL0700 ENGLISH AS A SECOND LANGUAGE I (COMP)
This course takes students from paragraph writing and revising through
an introduction to rhetorical models. The focus is on sentence writing,
including topic sentences, grammar review, idiomatic expression, and
usage. **Prerequisite: 0700 placement (4 credits) fall, spring**

ENGL0800 ENGLISH AS A SECOND LANGUAGE II (LIT & COMP)
This course is a continuation of English as a Second Language I.
Students will read literature as the basis of continuing development of
English comprehension skills and write expository essays. The course
will also introduce students to the research process and implementing
MLA style documentation. **Prerequisite: 0700 placement and ENGL0700; or
0800 placement (4 credits) fall, spring**

ENGL0850 ENGLISH AS A SECOND LANGUAGE LEARNING CIRCLE
This English language skills course is designed to provide additional
support to non-native speakers based on their final grade in ENGL080.
It will continue building on learned rhetorical modes while focusing on
sentence and paragraph structure. Students will analyze content and
grammar errors to improve fluency. **Prerequisite: ENGL0800 - required for
ENGL0800 grade of C- or lower (1 credit) fall, spring, summer**

ENGL0900 ENGLISH LANGUAGE SKILLS
This course promotes basic English language skills and writing practice
in which less than adequately prepared students may upgrade their
readiness for college-level study through improved reading, writing,
speaking and listening. **Prerequisite: 0900 placement (4 credits) fall**

ENGL1050 ENGLISH COMPOSITION
A short review of English basics is provided. Emphasis is on writing
coherent paragraphs and short essays, basic rhetorical strategies and
techniques of rewriting and editing. **Prerequisite: 4 units of high school
English (3 credits)**

ENGL1100 ENGLISH I
An introduction to college-level academic writing and research.
Instruction focuses on critical reading and analysis, composing and
revising strategies, writing for varied rhetorical purposes, critical
thinking, information literacy, and writing from sources. **Prerequisite:
1100 placement; or 0900 placement and ENGL0900; or 0800 placement and
ENGL0800; or 0700 placement and ENGL0700 and ENGL0800 with a grade of
C or higher; or 0700 placement and ENGL0700 and ENGL0800 with a grade of
C- or lower and ENGL0850 (4 credits) fall, spring, summer**

ENGL2050 LITERATURE AND COMPOSITION
This course introduces students to the study of literature and literary
themes in the genres of short story, poetry, drama, and novel. While the
emphasis is on critical reading and thinking, the course also encourages
the continued development of effective writing skills through frequent
writing assignments. **Prerequisite: ENGL1050 (3 credits)**

ENGL2200 ENGLISH II
A sequel to English I (ENGL1100) in which students will continue to
develop their writing and research skills and will study for Western
cultural movements - the Enlightenment, Romanticism, Modernism, and
Postmodernism - which will provide them with the cultural and historical
framework necessary for beginning their humanities and social science
electives. Students will explore these movements through the critical
reading of a range of texts, including fiction, poetry, drama, philosophy,
political theory, cultural history and theory, aesthetic criticism and theory,
and the personal essay. **Prerequisite: ENGL1100; or 0900 placement and
ENGL0900 and ENGL1100 (4 credits) fall, spring, summer**

**Facilities Management (CPCE) (CPFM)**

CPFM2000 INTRODUCTION TO FACILITY MANAGEMENT
This course examines the scope of the professional facilities
manager's responsibilities. The Facility Manager's role in relation to an
organization's strategic plan is stressed. Provides a solid understanding
of the fundamental concepts in Facilities Management and why a broad
understanding of the responsibilities of the profession is valuable to
facility managers and all professionals. Students will apply concepts
needed to successfully organize, monitor, communicate and develop a
good Facilities Management program. Guest speakers, case studies and
field trips will be used to help further illustrate Facilities Management
topics. (3 credits)

CPFM2100 SUSTAINABILITY IN THE BUILT ENVIRONMENT
This course provides a solid understanding of the fundamental concepts
in sustainable practices and why a broad understanding of the economic
and societal changes are valuable to all professionals. Students research
and apply necessary concepts to successfully organize, monitor,
communicate and develop a sustainability program. Case studies are
used to further illustrate topics on sustainability and the environment. (4
credits)

CPFM2300 SPACE PLANNING
Students follow the process of design, problem solving, and building
construction management as it relates to the use of interior space.
Students will develop comprehensive projects involving issues pertaining
to space planning, regulatory codes, building systems, material use and
construction methods. Team research projects will facilitate the ability to
work cooperatively. (3 credits)
CPFM3200 PROJECT MANAGEMENT FOR FACILITY MANAGERS
Students study methods, concepts and procedures of FM project management. Topics include team development, scheduling, budgeting/estimating, contract administration, purchasing, relocations, and move management. **Prerequisite:** Junior status or enrollment in the Professional Certificate in Facilities Management (3 credits)

CPFM3300 BUILDING OPERATIONS
Students examine how facilities, building operations, and maintenance organizations are managed. Topics covered include scheduling, equipment evaluation, training and long range planning. Students will explore how the interdependent mechanical systems in a facility work together and how all the elements of an efficient facility work in tandem for maximum effective value to the organization. **Prerequisite:** CPMF2000 (3 credit)

CPFM3800 SPECIAL TOPICS IN FACILITIES MANAGEMENT (CPCE)
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the semester schedule for the courses offered that semester. Contact the faculty assigned for more information about the course topic. (1 - 4 credits)

CPFM4100 FACILITY ASSESSMENT & FORECASTING
This course emphasizes the strategic role required of the facilities manager in providing information for corporate managers and executives for facility forecasting. Topics include corporate real estate, attorney and developer interface, operating budgets and capital expenditures, and building performance assessment. **Prerequisite:** Enrollment in Professional Certificate in Facilities Management (3 credits)

CPFM4200 ENERGY & SUSTAINABILITY
Students examine how facilities, building operations, and maintenance organizations are managed to understand energy creation, delivery and consumption. Topics include sources, forms, and methods used to assess and manage energy use in buildings. This course also provides a solid understanding of the fundamental concepts in sustainable practices. Students will apply concepts needed to successfully organize, monitor, communicate and develop a good sustainability program. **Prerequisite:** Enrollment in the Professional Certificate in Facilities Management (3 credits)

CPFM4600 PRINCIPLES OF REAL ESTATE & PROJECT MANAGEMENT
Students study real estate concepts pertinent to facility management. Topics include real estate financial management, site selection, RE master planning, leasing, purchase vs. lease, property management and highest and best use analysis. **Prerequisite:** CPMF4100 (3 credits)

CPFM5500 CAPSTONE IN FACILITY MANAGEMENT
Students will select their own project with the approval of the faculty for development through the semester. Students are encouraged to select an area of investigation that is a specialization within FM that most interests them. Project will be supported by written original investigation and submitted periodically during development for review by the faculty. **Prerequisite:** All CPMF required courses, except CPMF4600, must be successfully completed prior to this course (3 credit)

Facilities Management (FMGT)

FMGT7000 PROJECT MANAGEMENT APPLICATIONS
This course covers project management responsibilities from concept phase through completion. Developing project cost estimates will include budgeting and cost estimating, the delivery process, programming, team selection, managing construction, project closure, and oversight. Techniques for cost analysis, scheduling and procedures for contracting, construction coordination, and the control of change orders are reviewed. Methods for project control using scheduling and cost analysis techniques will be reviewed. Change order and claim management will be presented. Students will have the opportunity to work in virtual teams. (3 credits)

FMGT7100 CONTEMPORARY ISSUES IN MANAGING TECHNOLOGY
For many firms, IT is the largest capital investment of the capital expenditure in an organization. It is critical that executives of every function understand key components of technology in order to be successful in organizations. This course examines the impact of telecommunications technology on facility planning and management. Topics include the design and implementation of voice and data communication networks, client service applications, and business communications systems for enhancing collaborative work. Included is a study of the availability, capabilities, analysis, selection, justification, acquisition, installation, operation, and maintenance of computerized systems designed to enhance facilities management. (3 credits) summer

FMGT7200 ENERGY & SUSTAINABILITY
Students examine how facilities, building operations, and maintenance organizations are managed to understand energy creation, delivery, and consumption. Topics include sources, forms, and methods used to assess and manage energy use in buildings. This course also provides a solid understanding of the fundamental concepts in sustainable practices. Students will apply concepts needed to successfully organize, monitor, communicate and develop a good sustainability program. (3 credits) spring

FMGT7300 FACILITY OPERATIONS
This course provides a comprehensive study of operations management of environmental, communications, life/safety, and security systems in building. Areas of study include advanced mechanical and electrical systems, energy conservation, upgrading systems with tenants in place, preventive maintenance, and the implications of maintenance and operations for planning and design. Students will learn how computerized control systems are designed to work in buildings. Smart building automation topics are included in this course. (3 credits) fall

FMGT7800 GRADUATE SPECIAL TOPICS IN FACILITIES MANAGEMENT
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (4 credits)

FMGT8000 FACILITY MANAGEMENT CAPSTONE
This course is designed to integrate the learning from various MSFM courses and provide "hands-on experience" in problem solving and dealing with realistic facility management issues. As a capstone requirement of the program, students demonstrate fulfillment of an approved scope of work showing the analytical capacities and creative skills expected of a professional in this field. The demonstration can involve original research, a work-related project, or an extension of course-related work. The practical knowledge gained will directly apply to work situations and will also provide a source of knowledge for your own strengths and growth potential areas. A team project will be the focus of the course. (3 credits) spring
Facilities Planning Management (CMFM)

CMFM2300 SPACE PLANNING
Students follow the process of design, problem solving, and building construction management as it relates to the use of interior space. Students will develop comprehensive projects involving issues pertaining to space planning, regulatory codes, building systems, material use and construction methods as related to Facilities Management. Prerequisite: CONM1500 (4 credits) summer

CMFM2400 PROPERTY MANAGEMENT
This course will focus on how to develop programs for future space needs, determine how much space is required, and how to find new space and negotiate leases with owners and brokers. The interface with property managers plays a crucial role in this process. Students will visit sites in order to select the correct location in which to house all or part of an organization. (3 credits) spring

CMFM3000 FACILITY SPACE UTILIZATION & MANAGEMENT
This course focuses on space utilization and management by studying comprehensive facilities projects. Lectures and lab assignments will emphasize issues and guidelines that are often employed to manage space requirements over time. Prerequisite: Junior status (4 credits)

CMFM3200 PROJECT MANAGEMENT FOR FACILITY MANAGERS
Students study methods, concepts and procedures of FM project management. Topics include team development, scheduling, budgeting/estimating, contract administration, purchasing, relocations, and move management. (4 credits) spring

CMFM3300 BUILDING OPERATIONS
Students examine how facilities, building operations, and maintenance organizations are managed. Topics covered include scheduling, equipment evaluation, training and long range planning. Students will explore how the interdependent mechanical systems in a facility work together and how all the elements of an efficient facility work in tandem for maximum effective value to the organization. (3 credits) fall

CMFM3800 SPECIAL TOPICS IN FACILITY MANAGEMENT
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (1 - 4 credits)

CMFM4100 FACILITY ASSESSMENT & FORECAST
This course emphasizes the strategic role required of the facilities manager in providing information for corporate managers and executives for facility forecasting. Topics include corporate real estate, attorney and developer interface, operating budgets and capital expenditures, and build performance assessment. (4 credits) fall

CMFM4200 ENERGY & SUSTAINABILITY
Students examine how facilities, building operations, and maintenance organizations are managed to understand energy creation, delivery and consumption. Topics include sources, forms, and methods used to assess and manage energy use in buildings. This course also provides a solid understanding of the fundamental concepts in sustainable practices. Students will apply concepts needed to successfully organize, monitor, communicate and develop a good sustainability program. Prerequisite: CONM1000 (4 credits) summer

CMFM4600 PRINCIPLES OF REAL ESTATE FOR FACILITY MANAGERS
This course is designed to enable the student to understand the functioning of the competitive corporate real estate market. It covers real estate concepts pertinent to facilities management. Prerequisite: CMFM4100 (3 credits) summer

CMFM5500 CAPSTONE PROJECT IN FACILITY MANAGEMENT
Students will select their own project with the approval of the faculty for development through the semester. Students are encouraged to select an area of investigation that is a specialization within CMFM that most interests them. Project will be supported by written original investigation and submitted periodically during development for review by the faculty. Prerequisite: All CMFM or FMGT required courses, except CMFM4600, must be successfully completed prior to enrollment in this course (4 credits) summer

First Year Seminar (FYS)

FYS1000 FIRST YEAR SEMINAR
First Year Seminar introduces new students to the personal and academic skills and strategies necessary to successfully transition into Wentworth. Using a variety of pedagogical approaches to create an interactive learning-centered classroom, instructors both teach academic skills and serve as a first year advisor to provide support for common developmental issues. Students develop the skills necessary to achieve academic goals and social integration at Wentworth. (0 credits) fall

History (HIST)

HIST1101 US HISTORY TO 1877 (CPCE)
United States history from the colonial period through Reconstruction. Emphasis on the interpretation of American institutions and ideas. Prerequisite: ENGL1050 (3 credits)

HIST3800 SPECIAL TOPICS IN HISTORY
Special topics in history to be determined by the faculty assigned. Please contact assigned faculty for more information about the course topic. Prerequisite: Completion of an English sequence.

HIST4100 ANCIENT WORLD CIVILIZATIONS
This course surveys the cultures and histories of major world civilizations from human evolution until the 15th century C.E. with a concentration on European and Asian civilizations. Prerequisite: completion of an English Sequence (4 credits)
HIST4123 US HISTORY TO 1877
United States history from the colonial period to Reconstruction. Emphasis on the interpretation of American political, social, economic, cultural and religious institutions and the history of ideas. A research project is required. Prerequisite: completion of an English Sequence (4 credits)

HIST4171 TECHNOLOGY & SOCIETY
This course is a study of the relationship between technology and society from prehistoric times to the present day. Various topics are covered with emphasis given to the relationship of science, engineering, and technology. The social and cultural impact of technology throughout human history is a central aspect of the course. Prerequisite: ENGL1050 and ENGL2050 (3 credits)

HIST4175 MODERN AMERICAN HISTORY
The study of American civilization from the War Between the States to the turn of the 21st century. Emphasis will be placed on the cultural, economic, and political interactions of the melting pot experiences that led the United States to world power status. International states of affairs will also be studied. Prerequisite: completion of an English Sequence (4 credits)

HIST4191 HISTORY OF TECHNOLOGY
An examination of the history of technology and its relationship to social and historical change. A special emphasis will be placed upon the transitions from one technological age to another. Prerequisite: Completion of an English Sequence (4 credits)

HIST4200 PICTURES, MEDIA & US POLITICS
This history course examines relationships between images and politics from the American Revolution to the present. The course focuses on the developments in image technology and U.S. politics. In doing so, students will trace the rise of a national visual culture and modern political campaigns. Students will read history scholarship and analyze pictures from periods we study. The class will visit image collections throughout Boston to engage with historical prints, photographs and other visual materials. Prerequisite: completion of English Sequence (4 credits)

HIST4223 BOSTON HISTORY
This course surveys Boston history, spanning the colonial era to our contemporary environment. The course will emphasize themes of urban development, immigration, politics and segregation by race and class. Students will contribute to digital projects analyzing the city's past while also preserving it for the public. Prerequisite: completion of English Sequence (4 credits) fall

HIST4271 HISTORY OF WORLD WAR II
Students will be exposed to the events that precipitated the conflict and to the major battles and personalities of the war. The political results of the war and the start of the Cold War will also be examined. Prerequisite: ENGL1050 and ENGL2050 (4 credits)

HIST4300 AMERICAN URBAN HISTORY
This history course examines American city life from the Revolutionary War to the present. The course focuses on the way culture and politics evolved within the context of a changing urban landscape. In addition to reading historical scholarship students will analyze primary sources such as historical images, newspapers and films. We will also visit local museums and cultural institutions to learn about the history of Boston. Prerequisite: completion of English Sequence (4 credits)

HIST4451 HISTORY OF GENDER & SEXUALITY IN THE US
In this course students will examine the history of sexuality and gender in the United States through reading of historical, theoretical and scientific texts. The course will examine topics including feminism, identity, politics, race, and masculinity. Students will examine the way in which popular and historical perspectives on gender and sexuality are reflected in contemporary film and literature. Prerequisite: Completion of an English Sequence (4 credits)

HIST4475 HISTORY OF DESIGN
Using the Museum of Fine Arts as a study collection, this course surveys the global history of designed goods and design for industry from 1600 to the present, with emphasis on the twentieth century. It addresses not only styles and methods of production, but also trends in trade and consumerism. Prerequisite: completion of an English Sequence (4 credits)

Humanities (HUMN)

HUMN1051 INTRODUCTION TO ART & ARCHITECTURE (CPCE)
Art and Architecture reflect culture and technology, and represent significant career possibilities. Through readings, guest lectures, and field trips, students will explore outstanding examples in Boston, make critical reports, and develop skills for success in Architectural Technology at Wentworth. Prerequisite: ENGL1050 (3 credits)

HUMN3100 ROMAN CULTURE AND TECHNOLOGY
An introduction to how the Romans developed technological, institutional, and cultural solutions to meet the social and political demands of their empire, and to how Roman architectural, informational, engineering, and social accomplishments continue to be manipulated and reinterpreted because of their foundational influence on American culture. Prerequisites: Completion of an English Sequence (4 credits)

HUMN3800 SPECIAL TOPICS IN HUMANITIES
Special topics in humanities to be determined by the faculty assigned. These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the semester schedule for the courses offered that semester. Contact the faculty assigned for more information about the course topic. Prerequisite: Completion of an English Sequence (1 - 4 credits)

HUMN4011 AMERICAN CINEMA & CULTURE (CPCE)
This course deals with the historical development of American film and the film industry. Particular attention is given to the relationship between films and American culture. Prerequisite: ENGL1050 and ENGL2050 (3 credits)

HUMN4051 MEDIA CULTURE & COMMUNICATIONS
This course serves as an introduction to the theory and practice of Media, Culture and Communication Studies. Students will explore and critically examine, from a humanities perspective, our technologically mediated culture as it impacts society, and they will consider their own social, cultural, ethical, legal and philosophical roles and responsibilities as media content producers and consumers. Students will explore a variety of digital tools and techniques for analyzing texts, assessing problems, and communicating results. Prerequisite: Completion of an English sequence (4 credits)
HUMN4053 MCCS STUDIO
The increasing importance assumed by digital technologies in contemporary culture has given rise to new forms of critical and creative thinking, new ways to assess and organize humanistic knowledge, and new forms of communication. In this course, students interpret the cultural and social impact of the new information age, and create and apply new technologies to answer cultural, social, ethical and historical questions, both traditionally conceived and those enabled by even changing technologies. Students will work in small groups and apply various tools and strategies used by tech-savvy humanists to interpret history and culture within a collaborative, studio-based environment. Content of this course is variable by instructor and semester and may be repeated, with different content, for credit. Prerequisite: Completion of an English Sequence (4 credits)

HUMN4055 BOSTON VOYAGES BY BOOK & FOOT
This course will explore the history and culture of Boston through its literature, its citizens, its environment, and its civic and political events. It will examine the sites associated with the readings and sites featured in the texts along with the texts themselves. There will be visits to places of interest including but not limited to the Back Bay, the North and West Ends, and some of the city's smaller museums and green spaces. The investigation of these local sites will aid in making connections between Boston and the larger human community. Prerequisite: Completion of an English sequence (4 credits)

HUMN4200 ROMAN CULTURE AND TECHNOLOGY
An introduction to how the Romans developed technological, institutional, and cultural solutions to meet the social and political demands of their empire, and to how Roman architectural, informational, engineering, and social accomplishments continue to be manipulated and reinterpreted because of their foundational influence on American culture. Prerequisites: Completion of an English sequence (4 credits)

HUMN4221 AMERICAN CINEMA AND AMERICAN CULTURE
This course will examine selected critical American films as reflections of and products of American culture. The impact of certain particularly American themes on these films will be explored, both in an historical and artistic context. Prerequisite: Completion of an English sequence (4 credits)

HUMN4225 TELEVISION STUDIES
This course examines television from a cultural, historical, technological, commercial, and critical perspective, especially as the medium has developed from broadcasting to narrow casting. The primary outcome of this course is for students to progress from a consumer to a critical interaction with television. Prerequisite: completion of an English sequence (4 credits)

HUMN4230 STANDUP COMEDY IN AMERICA
In this course students will study the development of standup comedy in the twentieth-century America, specifically examining the intersections between standup performance and race, ethnicity, sex, class, and gender, among other subjects. Throughout the course students will study historical backdrops against which standup comedy was written and performed and analyze the influence of the standup tradition on American discourse and identity. Prerequisite: Completion of an English Sequence (4 credits) fall

HUMN4233 DECONSTRUCTING THE 20TH CENTURY
In the second half of the 20th century, something shifted in the American culture. This shift marked the post-WWII progression from modernity to post-modernity, which was widely reflected by changes in society, culture, and art. This course offers an accessible survey of the cultural, critical, technological, economic, and aesthetic foundations of postmodernism. We will particularly examine the postmodern challenge to traditional ideas of progress, authority, authenticity, knowledge, power, and language with its playful mixing of forms and high and low culture. We will progress through the course with a central question that asks if a positive pragmatic potential can be detected within the postmodern sensibility. Prerequisite: completion of an English sequence (4 credits)

HUMN4241 GRAPHIC NOVEL TO FILM
The graphic novel has blossomed as an art form. In addition, it has proven to be a fruitful source for cinema. This course will examine the graphic novel as an art form and as inspiration for film. What is the graphic novel? How does one "read" a graphic novel "critically"? When does it successfully translate to film and why? What does this teach us about film and about the graphic novel's visual content? These questions will guide us as we study several significant graphic novels and their film versions. Prerequisite: Completion of an English sequence (4 credits)

HUMN4243 CONTEMPORARY ART & THEORY
This course examines some of the major theoretical positions and developments informing contemporary (post-WWII) art. The aim of the course is to develop an understanding of contemporary visual culture in relation to social history and human experience, and a basic understanding of aesthetic theory, philosophy and criticism and its importance to contemporary art practices. Prerequisite: Completion of an English sequence (4 credits)

HUMN4245 TRANSCENDENTAL VISIONS
This course examines American Transcendentalism, the literary movement that emerged over the nineteenth century in protest to the intellectual, cultural, and national status quo. We will examine the canonical authors of the period, including Emerson, Thoreau, Whitman, Hawthorne, Melville, and Poe, to establish the period's continuities. Additionally, we will examine writers like Blackhawk, Margaret Fuller, Frederick Douglas, Harriet Wilson, and Rebecca Harding Davis to tease out its contradictions. Along the way, we will interact with modern day culture to consider how this early American narrative tradition holds contextual meaning as well as contemporary resonance. Prerequisite: Completion of an English sequence (4 credits)

HUMN4263 ART & SOCIETY IN THE INDUSTRIAL AGE
This course will primarily explore 19th century art in Europe with a look at the United States, from the perspective of their evolving modernity. The significance of the Industrial Revolution and the ensuing political upheavals of both continents will be closely studied through the visual imagery of artistic production. Further, the impact of emerging art theory will be analyzed by reading primary sources in the way of the artists' personal manifestos alongside contemporary critiques of the day. Prerequisite: Completion of an English sequence (4 credits)

HUMN4265 THE AMERICAN DREAM
An examination of that which is unique in the American experience as expressed in literature. This course will provide the student with a profile of the American character as portrayed in the national literature. The focus will be upon political, religious, and economic roots which illuminate the past and make the present more comprehensible. Prerequisite: Completion of an English sequence (4 credits)
HUMN4275 MYTH AMERICA: FROM COLONIES TO CULTURE WARS
This course is a survey of American art from the pre-colonial period to the present. American art production will be evaluated for both its aesthetic value and as a historical document. **Prerequisite:** Completion of an English sequence (4 credits)

HUMN4325 FROZEN! THE CLIMATE CRISIS OF 1816
This course engages with climate science and sustainability by looking back to the largest volcanic explosion in recorded history, the eruption of Mt. Tambora in April of 1815. The course examines the ensuing worldwide climate disaster from many perspectives: literature, history, art, music, mathematics, chemistry, physics and architecture. By connecting that crisis of global cooling with our own crisis of planetary warming, students come to understand that climate is not just a data set; climate is also a discourse with a cultural history that can be revealed through humanistic inquiry. **Prerequisite:** completion of an English sequence (4 credits)

HUMN4343 RENAISSANCE TO ROMANTICISM
An examination of the impact of globalization on a broad range of art communities in an effort to understand how expanded international connections have yielded re-definitions of cultural and national identity. **Prerequisite:** Completion of an English sequence (4 credits)

HUMN4345 HISTORY OF AMERICAN FOLK MUSIC
This course covers the history of American folk music from the work songs and spirituals of the 17th and 18th centuries to the folk revival of the 1960’s. Numerous musical genres and traditions will be covered including gospel, minstrelsy, blues, ragtime, country, and bluegrass within various social, cultural, and political contexts. Matters of race, class, and gender will be given particular emphasis. **Prerequisite:** Completion of an English sequence (4 credits)

HUMN4355 BOSTON VOYAGES BY BOOK & FOOT
This course will explore the history and culture of Boston through its literature, its citizens, its environment, and its civic and political events. It will examine the sites associated with the readings and sites featured in the texts along with the texts themselves. There will be visits to places of interest including but not limited to the Back Bay, the North and West Ends, and some of the city’s smaller museums and green spaces. The investigation of these local sites will aid in making connections between Boston and the larger human community. **Prerequisite:** Completion of an English sequence (4 credits) fall, spring, summer

HUMN4373 SHAKESPEARE ON FILM
This course will examine several of Shakespeare’s plays as literature and then how these plays have been brought to film, both in their historic and artistic contexts. In the course of this examination, the nature of film, the nature of artistic interpretation, the significance of audience response and the significance of authorial intent will be considered. **Prerequisite:** Completion of an English sequence (4 credits)

HUMN4401 CLASSICAL WORLD ON FILM
An introduction to the depiction and meaning of the classical world in films with a focus on critical cinematic analysis. The course explores how interpretations of the classical world have changed over the last century and how technology and mass communication have affected such developments through the medium of film. **Prerequisite:** Completion of an English sequence (4 credits)

HUMN4501 9/11 LITERATURE AND FILM
An exploration of how fiction and non-documentary film have addressed September 11, with particular emphasis on how works in these genres have portrayed the events of the day, the impact of the day on the United States and the world, and the mindset of the terrorists. **Prerequisite:** Completion of an English sequence (4 credits)

### Industrial Design (INDS)

**INDS1000 INDUSTRIAL DESIGN STUDIO 1**
Industrial Design Studio 1 develops a sensitivity and understanding of design principles through a series of three-dimensional projects. The design process emphasizes research, material preparation, iteration and verification of successful design outcomes against focused elements and principles for each project. Accurate craftsmanship and clear use of design nomenclature during critiques is stressed. **Corequisites:** DSGN1000 and DSGN1200 (4 credits)

**INDS1500 INDUSTRIAL DESIGN STUDIO 2**
Building upon the design foundations of Industrial Design Studio 1, Industrial Design Studio 2 advances an understanding of design principles through a thematic series of three-dimensional projects. The design process emphasizes research, material preparation, iteration and verification for each project, working toward a clear and meaningful design intent. Accurate craftsmanship and clear use of design nomenclature during critiques is stressed. This course reinforces nomenclature covered in INDS1000. **Prerequisite:** INDS1000 (4 credits)

**INDS1750 VISUAL COMMUNICATION**
This studio based course introduces the principles of visual communication and the creative process of design. Assignments explore techniques in both analog and digital media. Topics include visual literacy, typography, visual hierarchy, composition, and other fundamental concepts of two-dimensional design. (4 credits) fall

**INDS1850 VISUALIZATION 2: ADVANCED PERSPECTIVE**
This course introduces students to perspective drawing and sketching used by industrial designers. One and two-point perspective, line value, lighting, surface value, shade, shadow, and techniques are covered. **Prerequisite:** DSGN1000 (3 credits)

**INDS2000 INDUSTRIAL DESIGN STUDIO 3**
This studio focuses on design methodology and problem solving techniques to develop and enhance creativity. Small-scale design problems in packaging, table, and desktop products are used to build individual skill development. **Prerequisite:** INDS1500 (4 credits)

**INDS2300 3D REALIZATION I**
This introductory course develops basic model-making skills and the safe use of shop tools (hand and machine). Students will begin to construct study models in support of studio courses utilizing various papers, wood, metal, and plastics. **Corequisite:** INDS2000 (4 credits)

**INDS2350 VISUALIZATION 3: DRAW & THINK**
This course introduces students to advanced freehand drawing and format conventions used by industrial designers to communicate design concepts visually. Professional presentation skills are stressed. **Prerequisite:** INDS1850 (3 credits)

**INDS2500 INDUSTRIAL DESIGN STUDIO 4**
This design studio challenges the student to integrate previous design lessons in order to tackle more complex design problems. Manufacturing, user interactions, and advanced product aesthetics are covered. **Prerequisite:** INDS2000 (4 credits)
INDS2600 CAD 1: SURFACE MODELING
This introductory/intermediate course develops the students’ understanding of three-dimensional CAD utilizing NURBS based surface modeling techniques, and stresses a progression in constructional and visual problem solving skills. (3 credits)

INDS2800 3D REALIZATION 2
This course develops students’ three-dimensional visualization skills as related to the industrial design profession. Students will also investigate the appropriate use of metals, wood, plastics, specialty materials, and fabrication technologies to assemble study models for studio courses. Prerequisite: IND52300; Corequisite: IND52500 (4 credits)

INDS2850 VISUALIZATION 4: PRESENTATION & ILLUSTRATION
This course advances the student’s understanding of representing objects in three-dimensional freehand depictions and integrates the computer as a tool for refining and altering those depictions. Prerequisite: IND52350 (3 credits)

INDS3000 INDUSTRIAL DESIGN STUDIO 5
This studio focuses on the comprehensive integration of small-scale design problems with issues of appearance, function, materials, and manufacturing processes. Please refer to the Design Studio Grade Requirement in the Academic Catalog regarding the final grade for this course. Prerequisite: IND52500 (4 credits)

INDS3100 CAD 2: SOLID MODELING
This intermediate course develops the students’ understanding of three-dimensional CAD utilizing an industry standard parametric feature based solid modeler. This course stresses both visual and technical problem-solving skills. Prerequisite: IND52600 (3 credits)

INDS3200 HUMAN FACTORS IN DESIGN
Studies in the relationship of humans with products and equipment are explored. Methodologies, information output, human output, control, environmental conditions, and human factors applications are introduced. (3 credits)

INDS3300 INFORMATION ARCHITECTURE 1
This studio-based design course develops each student’s awareness and understanding of the visual language that designers use to graphically communicate information and meaning - visual storytelling. Students investigate the use of typography and image to communicate meaning in singular and sequential representations. Prerequisite: IND52600 (3 credits)

INDS3500 INDUSTRIAL DESIGN STUDIO 6
This studio-based design course focuses on various professional design concentrations such as sustainability, biomedical products, and exhibit design. Prerequisite: IND51750 (3 credits)

INDS3600 MANUFACTURING IN DESIGN
This course provides a basic knowledge of current manufacturing processes, materials, systems and production strategies commonly used in commercial product development. (3 credits)

INDS3650 ADVANCED RAPID PROTOTYPING
This course is an exploration of technologies currently available that provide the industrial designer with an advanced level workflow from 3D CAD modeling software through to rapid prototyping and tooling. Both additive and subtractive prototyping methods will be experienced utilizing laser cutting, 3D printing and CNC machining. Prerequisites: Junior status; IND52600 and IND52800 (3 credits)

INDS4000 INDUSTRIAL DESIGN STUDIO 7
This studio-based course focuses various design themes such as consumer electronics, furniture, and footwear design. Prerequisite: IND53500 (4 credits)

INDS411 DESIGN PERSPECTIVES: TOPICS IN HISTORY OF INDUSTRIAL DESIGN
Students take an in-depth look at selected movements, individuals, companies and/or product lines that are significant in the history of industrial design. Prerequisite: Junior status (4 credits)

INDS4300 INFORMATION ARCHITECTURE 2
This studio-based design course builds on the visual concepts introduced in Information Architecture 1. Projects focus on the visual display of qualitative and quantitative information in static and dynamic media. Prerequisite: IND53300 (3 credits)

INDS4500 BUSINESS IN DESIGN
This course examines the business of design practice by focusing on client/project management, marketing, professional communication and entrepreneurship. Professional standards and ethics in design are discussed. (3 credits)

INDS4511 PROFESSIONAL PRACTICE
The course examines business and legal aspects of Industrial Design practice by focusing on financial and project management, marketing, and personnel issues. Professional standards and ethics in design are discussed. (4 credits)

INDS4750 SENIOR SEMINAR
This class focuses on current design philosophies and professional trends in visual communication. Students debate and discuss the impact of such and speculate on the impact to the profession and the community at large. (3 credits)

INDS5000 RESEARCH: SENIOR STUDIES
In this course, students propose an area of study to faculty, who then define projects within areas of proposed study for students to choose from and develop a research document. This document becomes the basis for the student’s senior design project. (3 credits)

INDS5500 SENIOR STUDIES
This course is an independent capstone design studio focusing on an individual’s ability to process design research, develop compelling design ideas, and manifest those ideas for presentation in a professional manner. Prerequisite: IND54000 (4 credits)

Interior Design (INTD)

INTD1000 INTERIOR STUDIO I
The elements and principles of design are introduced in this course. Application of these principles and various forms of organization are explored through two and three dimensional design exercises. (4 credits)

INTD1500 INTERIOR STUDIO II
The principles and elements of interior design are introduced and explored through a series of studio projects. Prerequisite: INTD1000 (4 credits)

INTD1600 HISTORY OF INTERIORS
Historical survey of major design periods in interior architecture and furnishings from antiquity to the late 19th century with emphasis on the artistic, cultural, political, social, economic, and technological conditions which affected their development. (3 credits)

INTD1750 DRAWING II
The basic principles and methods for drawing three-dimensional space are explored using a variety of media. Mechanical, freehand and digital methods for producing orthographic, paraline and perspective drawings are introduced as critical tools for understanding and representing interior design. (3 credits)
INTD2000  INTERIOR STUDIO III
The design process is explored using several short-duration interior
design projects with simple programmatic requirements. Prerequisites:
INTD1750 and INTD1500 (4 credits)

INTD2100  MATERIALS
Interior finish materials and their applications are examined through
various aesthetic, code, sustainability and functional selection criteria. (3
credits)

INTD2250  DRAWING III
Intermediate drawing course exploring the production of interior
architectural drawing using digital drawing software. Orthographic and
three-dimensional drawing are produced. Emphasis is placed on the
production of drawings for studio design explorations and presentations.
Prerequisite: INTD1750 (4 credits)

INTD2500  INTERIOR STUDIO IV
Exploration of the design process is continued using project slightly
larger in scale and programmatically more complex. Prerequisite:
INTD2000 (4 credits)

INTD2600  HISTORY OF INTERIORS II
Historical survey of interior architecture and furnishings from the late
19th century to the present with emphasis on the artistic, cultural,
political, social, economic, and technological conditions which affected
their development. Prerequisite: INTD1600 (3 credits)

INTD2700  BUILDING SYSTEMS I
An introduction to basic building systems: structural, conveying, fire
protection, plumbing and water conservation. (3 credits)

INTD2800  PRESENTATION TECHNIQUES
Students explore rendering techniques and learn basic graphic design
principles for presentations. Lectures and demonstrations cover
rendering, three-dimensional drawing, basic typography and grid
structures for layout. Projects apply these concepts to the creation of
interior design presentation boards and student portfolios. Corequisite:
INTD2500 (4 credits)

INTD3000  INTERIOR STUDIO V
Demonstrating their proficiency with the design process, students
develop comprehensive solutions for a residential interior by synthesizing
their expanding theoretical, aesthetic and technical knowledge, including
sustainable design methodologies. Prerequisite: INTD2500 (6 credits) fall

INTD3100  CONSTRUCTION DOCUMENTS
Construction documents include drawings and specifications that are
used to communicate with a constructor and delineate the requirements
for transforming an interior design into real space. CAD (computer aided
design) and BIM (building information modeling) drawing methods as
well as standardized large and small project format specifications will be
explored to create drawing suitable for guiding a constructor through the
construction process. Prerequisite: INTD2250 (4 credits)

INTD3300  BEHAVIORAL ASPECTS OF DESIGN
Through lectures and discussions, students examine psychological and
social research that assesses the dynamic relationship between human
behavior and the physical environment with an emphasis on interior
spaces. Special populations may be discussed - the elderly, children, and
the physically challenged. Prerequisite: Junior status (3 credits)

INTD3500  INTERIOR STUDIO VI
Projects of intermediate programmatic complexity for business
office space are developed. Project resolution requires solutions that
simultaneously resolve theoretical, aesthetic and technical concerns,
including the use of sustainable design methodologies. Prerequisite:
INTD3000 (6 credits)

INTD3600  LIGHTING
Interior illumination is studied in-depth from aesthetic, technical and
functional points of view. Conceptual design and documentation, lamps,
linguaries, color rendition, lighting calculation and daylighting will be
presented through lectures, projects and site observation. (3 credits)

INTD3800  SPECIAL TOPICS IN INTERIOR DESIGN
Presents topics that are not covered by existing courses and are likely
to change from semester to semester. Refer to the Class Schedule for a
specific semester for details of offerings for the semester. (1 - 4 credits)

INTD4000  INTERIOR STUDIO VII
Projects of advanced programmatic complexity are studied. Project
resolution requires competent and comprehensive solutions that explore
and synthesize theoretical, aesthetic and technical issues, including
the use of sustainable design methodologies. Prerequisite: INTD3500 (6
credits)

INTD4100  BUILDING REGULATIONS
Building codes and standards applicable to construction and furnishings
are introduced. Students will learn to identify various construction
classifications and occupancy categories and to cross reference
guidelines, tables and charts found in the building codes. Additional
regulations including health codes, education and daycare, etc. are
reviewed. Prerequisite: INTD2700 (3 credits)

INTD4600  PROFESSIONAL PRACTICE
The course examines business and legal aspects of interior design
practice by focusing on financial and project management, marketing,
and personnel issues. Ethics and career path issues in design are
discussed. (3 credits)

INTD5000  SENIOR PROJECT: RESEARCH
Students begin their senior capstone project developing a document that
includes: a project statement; program, code and precedent research;
and a site (building). The major focus is a comprehensive study of
"programming": the systematic collection and documentation of project
parameters including both quantitative and qualitative data. Corequisite:
INTD4000 (3 credits)

INTD5500  SENIOR PROJECT: DESIGN
Using their Senior Project: Research document as a guide, students
design a comprehensive project of their own selection. This capstone
project requires students to demonstrate mastery of the design process
and fulfillment of their established learning objectives. Prerequisites:
INTD4000 and INTD5000 (6 credits)

Literature (LITR)

LITR1435  LITERATURE - 20TH CENTURY (CPCE)
An exploration of modern and contemporary fiction, in which students
will investigate how 20th century authors treat such themes as personal
and social conflict, isolation, globalization, hope, and despair. Prerequisite:
ENGL1050 and ENGL2050 (3 credits)

LITR3800  SPECIAL TOPICS IN LITERATURE
Special topics in literature to be determined by the faculty assigned.
These courses present topics that are not covered by existing courses
and are likely to change from semester to semester. Refer to the
semester schedule for the courses offered that semester. Contact
the faculty assigned for more information about the course topic.
Prerequisite: Completion of an English Sequence (4 credits)
LITR4301 POETRY WORKSHOP
Students will study various forms of poetry, and, as a result, be able to write their own poems based on their understanding of poetry as an art form. Prerequisite: Completion of an English Sequence (4 credits)

LITR4351 CONTEMPORARY LITERATURE
Readings in poetry, fiction, and drama of the Post-World War II period. This course examines American literature and cultural history from 1945 to the present. The work of major writers will be studied to gain insights into the life of our times. Prerequisite: Completion of an English Sequence (4 credits)

LITR4401 20TH CENTURY LITERATURE
Through the study of authors such as Remarque, Dostoevsky, Kafka, Sartre, and Hemingway, this course will assess the problems of alienation, isolation, and individual responsibility as they are confronted by modern man in the twentieth century. Prerequisite: Completion of an English Sequence (4 credits)

LITR4451 AMERICAN LITERARY CLASSICS
This course will provide an opportunity for students to explore the works of selected American writers whose vision and artistry have given distinct to American literature. Certain 19th and 20th century authors will be selected by the instructor. Prerequisite: Completion of an English Sequence (4 credits)

LITR4461 THE ART OF THE STORY
What makes a good story? This course answers that question through both study and practice. Students will analyze short stories by prominent authors, become versed in the basic elements of fiction, and write their own short stories. Prerequisite: Completion of an English Sequence (4 credits)

LITR4471 LITERATURE AND THE MODERN AGE
This course explores the modern age through the written word. Through a broad survey of texts, including fiction, non-fiction, poetry and drama, we will draw connections between the modern human condition - the construction, experience, and consciousness of the "self" - and its literary expression. The period examined is the mid-19th to mid-20th century. Prerequisite: Completion of an English Sequence (4 credits)

LITR4601 SCIENCE FICTION AND FANTASY
Readings in science fiction and fantasy including myth and legend and classic literature in the 19th and 20th centuries. The social implications of technology in the 20th century science fiction literature will be explored. Prerequisite: Completion of an English Sequence (4 credits)

LITR4651 SHORT FICTION
This course studies the form of the short story in the literature of Great Britain, the United States, and other nations. Content is variable. Stories are studied as a reflection of craft, culture, and ideas. Prerequisite: Completion of an English Sequence (4 credits)

Management (MGMT)

MGMT1000 INTRODUCTION TO MANAGEMENT
This informational seminar focuses on student discovery as related to the management discipline, careers, models and theories, and management research techniques. This seminar also introduces students to the concentrations within the management program. In addition, management concepts as they pertain to the field of facilities planning and management will be included (long range planning and development, business continuity/disaster recovery, developing effective service models etc). The roles and environments of project management will also be reviewed. Prerequisite: enrollment in BFPM or BSM (4 credits) fall

MGMT1010 INTRODUCTION TO PROJECT MANAGEMENT
This course surveys major areas of project management: design processes, scheduling, financing, production, marketing, and distribution. Organizational structures will also be discussed. (4 credits)

MGMT1025 COMPUTER BUSINESS APPLICATIONS
This course covers the implementation of computer programs for several business areas including marketing and accounting. Students will gain intermediate to advanced level word processing, spreadsheets, database, and presentation skills. Students will also gain skills using Web development, project management, and accounting tools. (4 credits) fall

MGMT1500 DECISION ANALYSIS FOR BUSINESS
This course introduces the basic concept of data analysis and approaches to the decision making process. It is designed to provide students with a sound conceptual understanding of the role that management science plays when making decisions. It emphasizes a wide variety of business modeling and application techniques to the solution of business and economic problems. Prerequisite: MATH1000 or MATH1040 (4 credits) fall, spring

MGMT2000 MANAGEMENT INFORMATION SYSTEMS
This course introduces the student to various concepts and considerations involved in the education, design, implementation and operation of Management Information Systems. This is an integrative course that brings together information, computers, and the systems approach. Prerequisite: MGMT1025 (4 credits) fall, spring

MGMT2060 INTRODUCTION TO TECHNOLOGY PROJECT MANAGEMENT
This course traces the development of project management as fundamental to completing projects effectively, delineates the leadership tasks that must be accomplished at each step of a project's life, and helps the student develop skills and wisdom in making decisions both by learning the ramifications of certain decisions and by seeing how those decisions are made in an example project. (3 credits) spring

MGMT2065 INTRODUCTION TO ENTREPRENEURSHIP
This course provides a basic understanding of the entrepreneurial / innovation process in both small and large businesses. Students discuss the critical role that opportunity recognition / creation plays in that process. Case studies and class exercises assist students in identifying their own personal goals as well as their unique skills and competencies related to the entrepreneurial / innovation process. Students will also examine how entrepreneurs, inventors and investors create, find, and differentiate between money-making opportunities and wishful thinking. (3 credits) spring

MGMT2100 MANAGEMENT COMMUNICATIONS
This course focuses on the development of professional level written and oral communication skills. Students will learn how to conduct a meeting, do an effective oral presentation, write technical descriptions, instructions and reports, and effectively present information to their clients. Standard business formats (memo, letter, etc.) will also be reviewed. Prerequisite: Completion of an English Sequence or enrollment in the Professional Certificate in Project Management (4 credits) fall

MGMT2200 RESEARCH METHODS IN BUSINESS
This course provides prospective managers with an understanding of the skills necessary to make effective use of formal quantitative and qualitative research and analytical processes. Prerequisites: MGMT1010 or MGMT1500 (4 credits) fall
MGMT2300 ORGANIZATIONAL BEHAVIOR
This course is aimed at developing understanding of organizational dynamics so that students can develop lasting strategies and actions that build and sustain high performance in individuals, groups, and organizations. The course also examines what people think, feel and do in organizational settings, focusing on individual, group, and organizational processes. Students are introduced to concepts from a vast array of behavioral sciences, including social, clinical and organizational psychology, sociology, and cultural anthropology. (3 credits)

MGMT2500 SYSTEMS ANALYSIS & DESIGN
The purpose of this course is to provide the student with an introduction to systems analysis and design. Topics include analyzing the business case, requirements modeling, data and process modeling, and development strategies. Students also learn about output and user interface design, data design, systems architecture and implementation, and systems operation, support and security. (3 credits) spring

MGMT2550 APPLIED PROJECT MANAGEMENT
Project management is increasingly important in today's world. This course covers the fundamental concepts and applied techniques for cost effective management of both long-term development programs and short-term projects. Project management principles and methodology are provided with special focus on planning, controlling, and managing projects to successful completion. The topics are divided into two categories: behavioral aspects of a project and the technical components that make up the project. Computer software will be utilized to provide hands-on practical. Mastery of the concepts introduced in this course should give students a significant competitive advantage in the marketplace. Prerequisite: MGMT1025 (4 credits) spring

MGMT2560 CYBERSECURITY LAW AND POLICY
This course examines the various laws - statutes, regulations, case law, administrative, international, and procedural regarding cybersecurity. New cybersecurity law is being developed every day, making it necessary to know not only "settled" cybersecurity law that has been in place for decades, but also where new law (both protections and obligations) is trending in the near future. Criminal and civil legal aspects are discussed. Students will learn how computers and other digital devices can be the tool and target of cybercrimes, including the legal authorities and obligations of both the government and private industry with respect to protecting computers, systems, and networks from attacks and attackers. Finally, students are presented with the necessity of appropriate policy development and enforcement regarding legal and ethical obligations. Prerequisites: COMP2500 (3 credits) fall.

MGMT2600 PROJECT RISK MANAGEMENT
This course offers a new perspective on project risk that centers risk management on building a healthy organizational culture that recognizes risk as the consequence of bad planning. The course will present new insights on building a risk management culture, while focusing on project management selection factors and financial return. (3 credits)

MGMT2650 CYBERSECURITY PLANNING
Cybersecurity requires advanced planning. This course will review the six primary cybersecurity plans: department, risk management, business continuity, governance, legal and communications. Each plan is presented through lecture, discussion and practice on the Wentworth cyber range. For each plan, students will experience the problems inherent in lack of planning, then review the basics of the plan, then experience the benefits of advance planning by running the exercise again on the cyber range, followed by an after-action discussion of the differences between the first and the second exercises. (3 credits)

MGMT2700 FINANCIAL ACCOUNTING
An introduction to the basics of the accounting process. The course covers the basic techniques of analyzing financial transactions, trial balances, and preparation of financial statements. (3 credits) fall, spring, summer

MGMT2750 INTEGRATIVE FINANCIAL ACCOUNTING
This course is an introduction to accounting concepts for business students. The accounting cycle; cash, accrual, and preparation of the financial statements and other methods of income measurement will be covered. Accounts receivable, methods of depreciation and payroll accounting also will be discussed. (4 credits) fall, spring

MGMT2800 CYBERSECURITY MANAGEMENT
This course prepares the student to manage in the cyber domain, primarily within any of the three main cyber areas: private enterprise, public agencies and the military services. No management educational background is presumed; those areas are briefly reviewed. No cybersecurity background is presumed. This course reviews and analyzes the main issues facing managers within the cybersecurity triad/industry today - and identify those that may be important tomorrow as well. Case studies from real managers will be used as the basis for the course. (4 credits)

MGMT2850 PRINCIPLES OF MARKETING
Designed to give the student a broad appreciation of the fundamentals of marketing analysis. Discussions of actual case studies are used to study advertising, personal selling, channels of distribution, marketing research, pricing, new product policy, and the marketing mix. Prerequisite: Junior status (4 credits) fall, spring, summer

MGMT3000 MANAGING & LEADING ORGANIZATIONS
This course examines the human aspects of management and is concerned with the ways in which the interactions of members of the management hierarchy contribute to the achievement of organizational goals. The course utilizes both case studies and textual material allowing students to apply management approaches to a variety of management situations and environments. Prerequisite: Junior status (4 credits) fall, spring, summer

MGMT3050 LEADERSHIP & MANAGEMENT
This course examines the purpose and design of contemporary organizations, and explores the impact of change in the workplace of the 21st century. Students are introduced to the structures, functions and responsibilities of organizations, including the various roles of managers in the process of organizing human, financial, physical and technical resources to achieve organizational goals. Current theories and methods for effective planning and managing change will be considered. Changing aspects of organizational leadership will be an important aspect of this course, with a particular emphasis on developing a global mindset and managing across cultures. (4 credits)

MGMT3060 TECHNOLOGY ACQUISITION
This course provides a practical project management approach to technology acquisition. The organizational strategic tasks related to technology acquisition and project management are covered. Students will actively participate in a seven-stage project process for technology acquisition, from the initiation phase to the closing operations phase. Prerequisite: MGMT2060 (3 credits) fall
MGMT3065 ENTREPRENEURIAL MARKETING
Entrepreneurial marketing reflects an alternative approach to conventional marketing. Marketing is approached as redefining goods and services (and their markets) in ways that produce a competitive advantage through innovative approaches. This course reviews a strategic approach to marketing built around innovation, calculated risk-taking, resource leveraging, strategic flexibility, customer intensity, and the creation of industry change. We will also explore how marketing and entrepreneurship affect one another. Entrepreneurial marketing has been called subversive marketing, disruptive marketing, radical marketing, guerrilla marketing, viral marketing, expeditionary marketing... all constituting an innovative marketing format. These alternative approaches to conventional marketing are brought together in this course as a fundamental shift that redefines the goods and services, as well as the markets themselves, in ways that produce sustainable competitive advantages. This is a strategic type of marketing built around six core elements: innovation, calculated risk-taking, resource leveraging, strategic flexibility, customer intensity, and the creation of industry change. Traditional internal (company) and external (industry / environment) analyses are employed to illustrate the respective impacts on entrepreneurial marketing, as are the traditional stages of enterprise development. The impact of marketing and entrepreneurship on one another is studied as an emerging concept. Managerial challenges confronting marketers in entrepreneurial ventures are discussed.
Prerequisite: MGMT2065 (3 credits) fall

MGMT3100 E-COMMERCE
Technology has long since impacted the way business is conducted. With the integration of the Internet into our daily lives, organizations now market their products and services differently, creating new revenue models that allow consumers to purchase virtually anything without leaving home. This course will explore the recent phenomenon of e-commerce and what this means for the future of business. Technologies making remote shopping possible will be studied. Students will actively engage through case studies, presentations and lively discussions.
Prerequisite: Junior Status (4 credits) summer

MGMT3200 ENGINEERING ECONOMY
The study of the effect of the time value of money and tax consequence on the analysis of engineering problems. Areas such as equipment and project costs and investment transactions are included. Prerequisite: MATH1000 or MATH1040 or MATH1035 or MATH1750 (3 credits) fall

MGMT3250 MANAGERIAL ACCOUNTING
The course deals with cost accounting information and its use in managerial decision-making. Budgets, cost behavior, and determination, profit and expense planning, production and materials planning are among topics considered. Prerequisite: MGMT2700 or MGMT2750 (4 credits) spring

MGMT3300 PROJECT PLANNING, SCHEDULING & CONTROL
This course will explore a holistic approach to project management. The content deals with planning, scheduling, organizing, and controlling projects. The course includes major topics of project management: strategy, priorities, organization, project tools, and leadership. Primary class emphasis is on the project management process and decision tools available to project managers. (4 credits)

MGMT3360 INTERNATIONAL BUSINESS
The International Business course discusses both the theories and practices of globalization, focusing upon the differences between domestic and international business. Essential managerial issues including but not limited to cultural and societal environment, trade theory, risk, government involvement, entry modes, economic integration, emerging markets, financial institutions, marketing and strategy will be reviewed. Combining lectures, discussions, case studies and examination of scholarly articles, students will develop a strong understanding that prepares them to apply those concepts taught in the classroom.
Prerequisite: MGMT3000 (3 credits)

MGMT3500 FINANCIAL MANAGEMENT
This course is an introduction to basic financial management. Topics include financial analysis and planning, working capital management, the time value of money, valuation, cost of capital, capital budgeting, dividend policy, different types of securities, short-term and long-term financial decision, and an introduction to international finance and international trade organizations. Prerequisite: MGMT2700 or MGMT2750 (4 credits) spring, summer

MGMT3550 GROUP PROCESSES & TEAM BUILDING
The third course in the Technology Project Management concentration provides experiences in applying the theories of group behavior and team building to the analysis of organizational behavior. This is a course on how to create, foster and manage organizations in which people thrive and perform at their best. It assumes that employee and group thriving is the key to project excellence. Students will have the opportunity to share their thoughts, opinions, and experiences with the class, and will also have the benefit of being able to learn from other students. In addition to lecture segments, students will experience the issues that arise when individuals interact in groups. Demonstrations, in-class exercises, and case-based discussions are featured prominently in this course.
Prerequisite: MGMT2060 (4 credits) spring

MGMT3565 TECHNOLOGY ENTREPRENEURSHIP
This course gives the student a unique understanding of how technology-focused firms are created and provides them with experience commercializing real technologies. Commercialization topics connecting technology and business will be the focus of the class. Topics will include intellectual property, convergence, industry creation, standards, modularity, and strategy. The outcomes will be applied by assessing the commercial potential of real ideas. The final project of student group work will be a business plan or feasibility study for commercializing the new technology. Prerequisite: MGMT2065 (4 credits) spring

MGMT3600 LABOR RELATIONS
Current labor law arbitration processes, labor agreements, and the negotiation process are interrelated in actual case studies. Grievance proceedings, wage negotiation, and contract negotiation are treated specifically. Prerequisite: Senior status (3 credits) summer

MGMT3625 LABOR RELATIONS (CPCE)
Current labor law arbitration processes, labor agreements, and the negotiation process are interrelated in actual case studies. Grievance proceedings, wage negotiation, and contract negotiating are treated specifically. Prerequisite: Senior status (4 credits)

MGMT3650 BUSINESS LAW
This course is designed to give students a basic understanding of the principles of the American legal system. It covers the foundation of the system and treats topics important to business and industry such as: business organizations, contract laws, torts, and commercial transactions. Prerequisite: Junior status (4 credits) fall, spring, summer
MGMT3700 HUMAN RESOURCES & LABOR MANAGEMENT
This course surveys what managers need to know about human resource management. The course covers staff planning, recruitment/selection, compensation/benefits, performance management and labor relations. **Prerequisite:** Junior status (3 credits) summer

MGMT3750 PROJECT EVALUATION & PERFORMANCE
This course will explore effective and efficient methods for evaluating project performance. The content deals with measurement of project trends and results through information arising out of the management of the project work breakdown structure. Significant class emphasis is on evaluating project performance measurements applicable to both current project results and future projections to project completion. (3 credits)

MGMT3800 SPECIAL TOPICS IN MANAGEMENT
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. **Prerequisite:** Junior status (1 - 4 credits)

MGMT3900 OPERATIONS MANAGEMENT
A study of planning and control methods for industrial and production processes. Typical topics included: scheduling, updating, time-cost analysis, cost control, resource allocation, and the role of personnel in projects. **Prerequisite:** Junior status and MGMT2500 (4 credits) summer

MGMT4000 PROJECT RESEARCH
This course is a preparation for MGMT5500, Senior Project, by having students investigate an approved study topic and plan a project for completion in Senior Project. **Prerequisite:** senior status; **Corequisite:** MGMT4250 (3 credits) spring

MGMT4060 TECHNOLOGY PROJECT MANAGEMENT SEMINAR
Students demonstrate their ability to structure and complete an integrative mini project that identifies and resolves an important technology or technology leadership issues(s). Students report the results of their efforts in written and oral form. **Prerequisite:** MGMT2060 (4 credits) spring

MGMT4100 POWER & LEADERSHIP IN ORGANIZATIONS
This course will provide an overview of approaches to leadership. The relationship between the factors of organization, power, and leadership are considered through provocative analysis. This course will include a combination of lecture, discussion, readings in leadership theory, media, role-play, and self-reflection. **Prerequisite:** Junior status (4 credits) spring

MGMT4150 MARKETING MANAGEMENT
Designed to give the student a broad appreciation of the fundamentals of marketing analysis. Discussions of actual case studies are used to study advertising, personal selling, channels of distribution, marketing research, pricing, new product policy, and the marketing mix. **Prerequisite:** Fourth-year status (4 credits)

MGMT4165 CREATING NEW VENTURES
This course explores the context, and comprehensive process, of new venture creation. Critical issues of new venture strategy and business planning will be addressed through readings, case analyses, guest speakers, a group project and interactive class discussions. We will review the practical skills necessary for evaluating and creating a new venture, evaluating business opportunities, and building and evaluating new product and business opportunities. Creating New Ventures provides the most practical aspects to complement the theoretical approach of the Introduction to Entrepreneurship course. **Prerequisite:** MGMT2065 (4 credits) spring

MGMT4250 STRATEGIC MANAGEMENT
This course presents and explains concepts and theories useful in understanding the strategic process. It provides students with the opportunity to apply concepts, skills, and techniques to real-world corporate problems. **Prerequisites:** MGMT1000 and MGMT3000 and MGMT2850; **Corequisite:** MGMT3500 (4 credits) spring

MGMT4300 INTEGRATIVE SEMINAR
Integration occurs when one is able to bring unity and coherence to several, distinct elements. The basic goal of the Integrative Seminar is to provide students with an opportunity, singly and in group discussion, to consider how the various functions and skills of management can work together to advance organizations in achieving strategic goals. This seminar will address important linkages among topics and assignments in management courses and show how their combined use makes for a deeper understanding of management success. **Prerequisite:** senior status (3 credits) spring

MGMT4400 BUSINESS NEGOTIATION PRINCIPLES
Executives, managers and employees are in constant states of negotiation - for ideas, for resources, for budget and for the best people. Successful negotiations require positioning, preparation, commitment, needs assessment, packaging words persuasively, use of negotiation tactics, and thinking on your feet. It is one of the most demanding skills in a manager's tool kit. This course is designed to give students an understanding of the key elements of successful negotiation, and to help develop and enhance negotiation skills through role-play and practice. (3 credits) spring, summer

MGMT5500 SENIOR PROJECT
A capstone course. Students undertake a significant project with faculty guidance. A project presentation is required. **Prerequisite:** MGMT2600 or MGMT4250 (4 credits) fall

MGMT5505 PROJECT MANAGEMENT CAPSTONE
Students will examine current professional practice through the case study method. Case studies and lectures will be selected to reflect the students' discipline area. This courses focuses on project management concepts, techniques, and practices. Relevant literature and research from related disciplines such as management and communications will be included. Since each project is unique, the particular mix of tools and techniques necessary to effectively and efficiently accomplish objectives will change from project to project. The course deliverable is a significant group report in written and presentation format about a major recognizable project. The development of the assignment is itself designed to require the use and application of project management tools to enhance student understanding. (6 credits)

MGMT5510 CIS SENIOR PROJECT
A capstone course: Students undertake a significant project with faculty guidance. A project presentation is required. **Prerequisite:** MGMT3000 or MGMT4250 (4 credits) summer

MGMT7000 BUSINESS RELATIONS & HUMAN RESOURCE MANAGEMENT
Global Business Relations and HR Management covers understanding human resources from an enterprise or project portfolio level and how to manage a diverse workforce where managers and employees may be in different countries. This course will include a review of negotiating in different cultures. (3 credits)
MGMT7025 PROJECT SCHEDULING & COST PLANNING
Time and cost, tow of the three most important pillars of project management, are examined in this course. Students will study advanced techniques for planning, managing, and controlling both schedules and cost. Topic include managing the critical path, resource leveling, scheduling within constraints, cost estimation methods, break-even analysis, and earned value management. A good project manager will be able to manage risk and scope creep and keep the project on a realistic timeline and budget. Students will utilize well-recognized software, while learning to manage time and cost. (3 credits) fall.

MGMT7050 BUSINESS FINANCE & INVESTMENT
This course is designed to develop the financial skills and thought processes necessary to understand and implement financial policy decisions in a global economy and addresses the impact of legal, social, technological and ethical considerations related to the practice of corporate finance. The course stresses effective written and oral communication skills necessary for the design and implementation of financial decisions. (3 credits)

MGMT7100 PROJECT MANAGEMENT APPLICATIONS
Through individual and group activities, including case studies, students will develop skills in using project management tools and techniques. Focus will be on understanding how to develop requirements, monitor progress, make adjustments and successfully meet the business needs of the project. (3 credits)

MGMT7125 RISK MANAGEMENT
This course examines the project risk management process from identification through mitigation. Risk management seeks to increase the likelihood of positive events and decrease the impact of negative events. Project Management Body of Knowledge (PMBOK) Guide lists six risk management processes all of which are studied in this course: risk management planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning, and risk monitoring and control. Prerequisite: MGMT7025 (3 credits) fall

MGMT7150 BUSINESS OPERATIONS & PROCESS MANAGEMENT
Business Operations and Process Management focuses on the set of value-added activities that transform inputs into many outputs through effective planning, scheduling, use and control of resources; includes examination of design engineering, industrial engineering management information systems, quality management, production management, inventory management, accounting, and other functions as they affect the organization, including global logistics and sourcing. (3 credits)

MGMT7200 LEADERSHIP
This course examines the critical roles and functions of leadership with an emphasis on how leaders influence organizational performance and manage change. Topics include how to set direction, creating a culture of resilience to change, the use of power and influence, and leading and managing in a dynamic environment where the external environmental factors are rapidly changing. (3 credits)

MGMT7225 PROJECT TEAM BUILDING & LEADERSHIP
This course examines the importance of processes of project team building and leadership. Building and leading high-performing project teams is essential to project success. Successful projects depend on the effectiveness of the project team and team leader’s ability to motivate and manage the members. Project Team Building and Leadership focuses on team formation and development and motivating team members. Topics include assessing the abilities and effectiveness of team members, team building, leadership, motivation, conflict resolution, and effective actions for developing and utilizing teams and team members. (3 credits) spring.

MGMT7250 STRATEGIC FINANCIAL DECISION MAKING
This course provides the student with a clear understanding of how accounting data is used to communicate financial information to those outside the business unit and the organization and to upper level management. Students learn to evaluate financial issues and become thoroughly familiar with the concepts and mechanics of the balance sheet, income statement, and statement of cash flows. Course emphasis is on using financial data as an effective tool for decision making. Students learn how to present project proposals, financial data, capital plans capital requests, and strategic plans to upper level management. (3 credits)

MGMT7300 ECONOMICS & INTERNATIONAL BUSINESS
This course provides a principles-based approach to understanding the scope, nature, opportunities and challenges involved in conducting business in the global economy. In addition to studying the international economic institutions, the course will cover the topics of international trade, international finance, and regional issues in the global economy. (3 credits)

MGMT7325 AGILE PROJECT MANAGEMENT
This course examines traditional and agile project approaches. When developing a technological solution, many organizations find that the traditional approach to project management is too rigid. In this course, students study the advantages and disadvantages of the traditional and agile project approaches and learn to apply the appropriate project management strategy. Students explore iterative frameworks, such as Scrum, and become well-versed in the process, activities, deliverables, and team roles of agile methodologies. The student will learn and sue appropriate software to manage agile and hybrid projects. Prerequisites: MGMT7025, MGMT7125 and MGMT7225 (3 credits) summer.

MGMT7350 MARKETING MANAGEMENT
From understanding marketing strategy to the fundamentals of the sales and marketing mix (product, price, place of distribution, and promotion), to the tools required for gathering business intelligence, students will learn the key role of technology to marketing in a technical environment. (3 credits)

MGMT7400 EXECUTIVE LEADERSHIP
This course explores the major elements of organizational dynamics from multiple perspectives, including organizational design, work practices and cultural norms, and the relationship between power and influence. Students will evaluate different approaches to designing and implementing organizational change, as well as the role of leadership in contemporary organizations. (3 credits)

MGMT7425 MANAGING TROUBLED PROJECTS
This course examines how project managers identify failing projects and the skills to recover. Students learn the symptoms of a troubled project, how to assess projects, and how to create a recovery process. Being proactive with a challenged project is critical to a project’s successful completion. Students explore how to avoid common pitfalls and how to ‘fail fast’ if the project is destined to fail. Prerequisites: MGMT7025, MGMT7125 MGMT7225 and MGMT7450 (3 credits) summer.
Manufacturing (MANF)

MANF1000 MANUFACTURING PROCESSES
This course is designed to provide a basic understanding of present-day manufacturing processes. Through lectures, demonstrations, and practical applications, the student will be introduced to various manufacturing processes. Topics will include machine tools, welding, casting, sheet metal, and an introduction to numerical control programming. (4 credits)

MANF1500 INTRODUCTION TO ADDITIVE MANUFACTURING
This course introduces the student to the fundamental principles involved in a variety of Additive Manufacturing technologies. Each student will be required to design and 3D print a working mechanism using knowledge learned during this course. Topics include: Overview of Additive Manufacturing, Introduction to several 3D Printing technologies, Industries and Applications of Additive Manufacturing, Design Tips, Software Tutorials, Material Properties, Post-processing Techniques, Part Orientation, 3D Printer Machine Terminology, and hands-on experience with 3D Printing. Prerequisite: MECH2300 (4 credits)

MANF2000 COMPUTER AIDED MANUFACTURING
Students will utilize PC based industrial CAM software and Computer Numerical Control machines to produce machine tool programs and parts. Prerequisite: MANF1000 (3 credits)

MANF3000 MANUFACTURING ENGINEERING
Topics in lean manufacturing, six-sigma, group technologies, automated systems, visual controls (5s) and production processes and planning will be covered. Prerequisite: MANF1000 and MANF2000 (3 credits)

Mathematics (MATH)

MATH0900 BASIC ALGEBRA
Algebraic operations and equations, exponents and radicals, polynomials and factoring, and introduction to the geometry of angles and triangles. Prerequisite: Placement through the College of Professional and Continuing Education (4 credits)

MATH1000 COLLEGE MATHEMATICS
Algebra and trigonometry, including algebraic fractions, systems of linear equations, quadratic equations, literal equations, word problems and their solutions, right triangles, and vectors. Applications will be stressed. (4 credits) fall, spring

MATH1005 COLLEGE MATHEMATICS A
Topics in college algebra including exponents, radicals, complex numbers, polynomials, factoring, algebraic fractions, equation solving techniques, an introduction to functions and their graphs, and linear functions. (3 credits)

MATH1007 APPLICATIONS IN COLLEGE MATHEMATICS
This class provides additional enrichment applications for students enrolled in MATH1000, College Mathematics. Students will take a leadership role in this class to work on advanced application problems and look at how College Mathematics fits in with the rest of their major's curriculum. Corequisite: MATH1000

MATH1020 PLANE & SOLID GEOMETRY
A survey of elementary Euclidean geometry including lines and angles, measurement and units, properties of triangles, parallelograms, trapezoids, regular polygons, circles, conic sections, spheres, cylinders, pyramids, polyhedra, areas, and volumes. (4 credits) spring
MATH1030 STATISTICS & APPLICATIONS
This course is designed to introduce students to statistical concepts relating to engineering design, inspection, and quality assurance. Topics covered include probability, normality, sampling, regression, correlation, and confidence intervals in reliability. (4 credits) fall, spring

MATH1035 COLLEGE MATHEMATICS B
Topics in college algebra including functions and their graphs, composite and inverse functions, applied functions and variation, quadratic functions, exponential functions, logarithmic functions, systems of equations, and applications. Prerequisite: MATH1005 (3 credits)

MATH1040 APPLIED MATHEMATICS FOR BUSINESS
The purpose of this course is to provide students with the basic math skills useful in solving real-life business problems. Linear and quadratic equations will be studied and applied to finance and social sciences. Functions and graphs will be studied and applied to the basic data analysis. Systems of linear equations and linear programming will be applied to maximizing profit. An introduction to probability and statistics and basic financial mathematics are provided. (4 credits) fall

MATH1065 COLLEGE MATHEMATICS C
Topics in college algebra and trigonometry including the trigonometric functions, inverse trigonometric functions, trigonometric identities, trigonometric equations, and applications. Prerequisite: MATH1035 (3 credits)

MATH1500 PRECALCULUS
Topics include: polynomial and rational functions, exponential and logarithmic functions, trigonometric functions, parametric equations, analytic trigonometry, multivariable systems, and applications and modeling. Prerequisite: MATH1000 (4 credits) fall, spring, summer

MATH1550 FOUNDATIONS OF APPLIED MATHEMATICS
Problems, methods, and recent developments in applied mathematics will be discussed. Topics include, but are not limited to, the following: difference equations, fitting models to data and choosing a best model, probabilistic models, sequential decisions and conditional probability and game theory. Students will gain familiarity with technical word processors such as LaTeX, spreadsheet software and also with high level programming packages such as python, R, and MATLAB. Students will also hear guest speakers describe the role that mathematics plays in their respective careers. (4 credits) fall

MATH1700 CALCULUS I
Topics include: introduction to limits, definition of the derivative, differentiation of algebraic and transcendental functions, implicit differentiation, applications of the derivative and introduction to integration. Prerequisite: MATH1065 or MATH1500 (4 credits)

MATH1750 ENGINEERING CALCULUS I
Limits, continuity, differentiability, the limit definition of the derivative, differentiation, linearization and some integration of algebraic and transcendental functions, implicit differentiation. Intended for engineering majors or advanced technology students. (4 credits) fall, spring, summer

MATH1775 INTEGRATED ENGINEERING CALCULUS I
Limits (including L’Hopital’s Rule), continuity, differentiability, the limit definition of the derivative, differentiation of algebraic and transcendental functions. Integrates symbolic tools, graphical concepts, data and numerical calculations. Students will model engineering and scientific problems in lecture and lab. (4 credits)

MATH1800 CALCULUS II
Techniques of integration, the fundamental theorem of calculus, area, L’Hopital’s Rule, improper integrals, and applications of definite integrals. Prerequisite: MATH1700 (4 credits)

MATH1850 ENGINEERING CALCULUS II
Define integrals as a limit of Riemann sums, computation of definite and indefinite integrals using the techniques of integration, improper integrals, convergence of sequences and series, and approximating functions and estimating the error using Taylor and Maclaurin series. Prerequisite: MATH1750 or MATH1775 (4 credits) fall, spring, summer

MATH1875 INTEGRATED ENGINEERING CALCULUS II
Define integrals as a limit of Reimann sums, computation of definite and indefinite integrals using the techniques of integration, improper integrals, convergence of sequences and series, including Taylor series. Integrates symbolic tools, graphical concepts, data and numerical calculations. Students will model engineering and scientific problems in lecture and lab. Prerequisite: MATH1775 (4 credits)

MATH1900 INTRODUCTION TO OPERATIONS RESEARCH
This course serves as an introduction to the field of operations research (OR). The course will cover basic deterministic (non-probabilistic) methods of operations research (linear programming, network flows, and integer programming) and their applications to resource allocation problems in business and networking. Prerequisite: MATH1500 or MATH2800 (4 credits) summer

MATH1950 FINANCIAL MATHEMATICS
This course is designed to prepare students for the Society of Actuaries Exam FM (Financial Mathematics) This course will develop knowledge of the fundamental concepts of financial mathematics and how these concepts are applied in the time of value of money, loans, bonds and general cash flows and portfolios. General theories of interest such as annuities, yield rates, and amortization will be covered. Bonds and other securities and additional topics in financial analysis such as determining interest rates and interest rate swaps will be covered. Prerequisites: MATH1800, MATH1850 or MATH1875 (4 credits)

MATH2000 CALCULUS III
Three dimensional Cartesian coordinate system, vectors, lines in three dimensions, planes and other surfaces, partial derivatives, directional derivatives, local extrema, polar coordinates, and multiple integrals in Cartesian and polar coordinates. Prerequisite: MATH1800 (4 credits)

MATH2025 MULTIVARIABLE CALCULUS
Three dimensional Cartesian coordinate system, vectors, lines in three dimensions, planes and other surfaces, partial derivatives, directional derivatives, local extrema, polar coordinates, and multiple integrals in Cartesian and polar coordinates, vector fields, line integrals, and Green’s Theorem. Prerequisite: MATH1850 or MATH1875 (4 credits) fall, spring, summer

MATH2100 PROBABILITY & STATISTICS FOR ENGINEERS
Topics studied are basic probability and a variety of probability distributions used in engineering modeling and reliability (expected life of products); linear regression and correlation; and hypothesis testing. Prerequisite: MATH1800 or MATH1850 or MATH1875 (4 credits) fall, spring, summer

MATH2200 ADVANCED STATISTICS
Topics include: design of experiments, correlation and regression, analysis of variance, t-tests, nonparametric methods, failure, mode, and effects analysis. Prerequisite: MATH2100 (4 credits) spring
MATH2250  TIME SERIES
The course will provide a basic instruction to time series. Topics include time series regression and exploratory data analysis, ETS, MA, ARMA/ARIMA models, parameter estimate, model diagnostics, seasonal models and forecasting. **Prerequisite:** MATH2100 (4 credits) fall

MATH2300  DISCRETE MATHEMATICS
Topics of this course to be chosen from: elementary logic, sets, permutations and combinations, induction, relations, digraphs, functions, trees, Warshall's Algorithm, and Boolean algebra. **Prerequisite:** MATH1500 or MATH1065 (4 credits) fall, spring

MATH2425  CRYPTOLOGY
This course will introduce the mathematics of historical and modern cryptography. There will be emphasis on both cryptography, the making of codes, and cryptanalysis, the deciphering of coded messages without a key. Topics include, but are not limited to: enumerative combinatorics, probability, statistics, linear algebra, finite groups and number theory. (4 credits) fall. **Prerequisite:** MATH2300

MATH2500  DIFFERENTIAL EQUATIONS
Introduction to the solution of ordinary differential equations (ODEs). Topics will include solving first and higher order ODEs with constant coefficients, simple matrix equations and systems of ODEs, applications, and Euler's and Laplace transform solution methods. **Prerequisite:** MATH1850 or MATH1875 (4 credits) fall, spring, summer

MATH2550  TRANSITION TO ADVANCED MATH
Students will review elementary logic and earn standard proof techniques: direct proof, proof by contradiction, contraposition, cases and induction. Students will write proofs of statements related to sets, relations, functions. Quantifiers, set operations, equivalent forms of mathematical induction, equivalence relations, partitions, graphs of relations, surjections, injections and cardinality will be discussed. **Prerequisite:** MATH2300 (4 credits) spring

MATH2650  QUANTITATIVE METHODS
Set theory and logic, basic matrix notation and manipulation, linear programming, and simplex method are studied. An introduction to probability and statistics is provided. Applications of these concepts are then applied to management problems with a survey of inventory problems, forecasting, and decision-making. **Prerequisites:** MATH1065 (3 credits)

MATH2750  DIFFERENTIAL EQUATIONS & SYSTEMS MODELING
Linear systems, matrix algebra, eigenvalues and eigenvectors, solutions of first and second order ordinary differential equations, stability and equilibrium solutions, Laplace transforms, state space models and simulation. **Prerequisite:** MATH1800 or MATH1850 or MATH1875 (4 credits) fall

MATH2800  FINITE MATH
Set theory and logic, matrix notation and manipulation, linear programming and simplex method are studied. An introduction to probability and statistics is provided. Problem-solving by computer. **Prerequisite:** MATH1000 (4 credits) spring

MATH2850  LINEAR AND VECTOR ALGEBRA
This course is an introduction to linear and vector algebra with computer science applications. Topics include: vector and matrix operations, linear transformations, curves and surfaces. **Prerequisite:** MATH1500 Precalculus.

MATH2860  LINEAR ALGEBRA & MATRIX THEORY
Topics include the basic operations of n-tuples and matrices, geometric vectors, equations of lines and planes, systems of linear equations, row reduction of matrices, linear independence, determinants, and an introduction to basis, dimension, eigenvalues, eigenvectors, and vector spaces. **Prerequisite:** MATH1850 (4 credits) fall, spring

MATH3100  MEDICAL IMAGING: A MATHEMATICAL APPROACH
This course will provide basic mathematical foundations for medical imaging. There will be emphasis on both theoretical background and numerical methods to implement inversion algorithms. Topics include, but are not limited to: Radon and Fourier transforms, convolution, sampling, filters, and image reconstructions. **Prerequisite:** MATH2025 (4 credits)

MATH3150  STOCHASTIC PROCESSES
This is an introduction to stochastic processes and their application to a large variety of probabilistic problems. The material will be taught without the need to measure theory. Topics include: Markov chains with both finite and infinite state spaces, random walks, transience and recurrence, branching processes, continuous time Markov chains such as the Poisson process and birth-death processes. We will also discuss martingales and Brownian motion. Other topics may be included as time permits and depending on student interest. Computer visualization will be employed, along with simulation. There is a project component to the course as well, and topics will be chosen according to student interest that relates to specific stochastic processes. **Prerequisite:** MATH2100 (4 credits)

MATH3200  DIFFERENTIAL GEOMETRY
This course covers basic differential geometry curves and surfaces, with generalization to abstract differentiable manifolds. Topics include arc length, curvature and Frenet frame of space curves, and Gaussian and normal curvature of surfaces. For embedded curves and surfaces as well as for abstract manifolds, geometry is defined in terms of tangent and cotangent spaces, with diffeomorphisms giving rise to mappings between geometries via pullback and pushforward maps. The course includes treatment of the Gauss-Bonnet Theorem and its importance in relating geometric and topological aspects of surfaces. **Prerequisites:** MATH2025 and MATH2860 (4 credits)

MATH3225  FUNCTIONAL ANALYSIS
This course covers analytic properties of normed linear spaces, in particular functional spaces important to the theory of differential equations and probability. Topics include metric spaces and the notion of completeness; normed and Banach spaces; bounded linear operations; dual spaces; inner product spaces and Hilbert spaces. **Prerequisites:** MATH2500 and MATH2860 (4 credits)

MATH3250  HAZARD & CATASTROPHE MODELING
This course is designed to introduce student to the development of catastrophe models in the context of determining insurance policy premiums. We will discuss model development, parallel computing used to generate a catalogue of data, parameter estimation for models and statistical analysis to test quality assurance. Students will work in small groups to work on either earthquake, flood or wildfire models, and present their progress and final results throughout the semester in a professional manner. **Prerequisites:** MATH2850 and MATH2500 or MATH2750; and MATH2100 or BMED4600; and MATH2025 (4 credits)
MATH3500 CALCULUS IV
Topics include the analytic geometry of two- and three-dimensional coordinate systems including polar, cylindrical and spherical coordinates; a review of the fundamental theorem of line integrals and Green's theorem; orientation and parametrization of lines and surfaces; surface integrals; the divergence theorem; Stokes' theorem; the Jacobian; the general substitution rule for integration; constrained optimization and curvature. Other topics may be included as time permits. Computer visualization will be emphasized. Prerequisite: MATH2025 (4 credits)

MATH3700 OPERATIONS RESEARCH
An introduction to operations research, with topics chosen from linear programming (covering formulation of a number of different types of linear models, the simplex algorithm, duality and sensitivity analysis, the transportation and assignment problems, and integer linear programming). Network models, constrained optimization, modeling and simulation, and game theory are also discussed. Prerequisite: MATH2860 (4 credits) fall

MATH3800 SPECIAL TOPICS IN APPLIED MATHEMATICS
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (1 - 4 credits)

MATH3900 NUMERICAL ANALYSIS I
Analysis of algorithms frequently used in mathematics, the sciences, engineering and industry. Topics include: root-finding, interpolation, linear systems, numerical differentiation and integration, solution of initial value problems. Numerical experiments will be conducted with C, Matlab, Java, Python or another appropriate high-level language. Prerequisites: COMP1000 and MATH1850 (4 credits) fall

MATH3950 NUMERICAL ANALYSIS II
This course will discuss the theoretical basis of convergence and numerical linear algebra. Topics include: proofs, Cauchy sequences, absolute convergence, orthogonal polynomials, matrix factorization, and error bounds. Numerical experiments will be conducted with C, Matlab, Java, Python or other appropriate high-level language. Prerequisite: MATH3900; Corequisite: MATH2860 (4 credits) spring

MATH4050 MACHINE LEARNING
Introduction to the field of machine learning. This course focuses on algorithms to help identify patterns in data and predict or generalize rules from these patterns. Topics include supervised learning (parametric/non-parametric algorithms, kernels, support vector machines), model selection, and applications (such as speech and handwriting recognition, medical imaging, and drug discovery). Students who have basic programming skills and who have taken a course in probability are encouraged to take this course. Cross-list with COMP4050 Prerequisite: COMP1000 and MATH2100 (4 credits)

MATH4100 INDUSTRIAL PROBLEMS IN APPLIED MATHEMATICS
This is an applied problems course in mathematics. Students will work in small teams to solve problems arising in industry under the guidance of the course professor and an industrial liaison. Every term will be different. (4 credits)

MATH4400 INTRODUCTION TO ABSTRACT ALGEBRA
Topics include groups, subgroups, and factor groups, homomorphisms, rings and fields, and applications that may include symmetry groups, frieze groups, and crystallographic groups and/or introductions to algebraic coding theory. This course is recommended for students intending to go to graduate school for mathematics or a mathematics-related discipline. Prerequisite: MATH2300 (4 credits)

MATH4475 ACTUARIAL MATHEMATICS
This course is designed to prepare students for the Society of Actuaries' exam P/CAS Exam 1. We will develop knowledge of the fundamental probability tools for quantitatively assessing risk with an emphasis on problems encountered in actuarial science. Prerequisite: MATH2100 completed with a grade of B or better (4 credits)

MATH4575 COMPLEX VARIABLES
Topics in this course include complex algebra and functions; analyticity; contour integration, Cauchy's theorem; signatures. Taylor and Laurent series; residues, evaluation on integrals; multivalued functions, potential theory in two dimensions. Prerequisites: MATH2025 (4 credits)

MATH4875 REAL ANALYSIS I
Introduction to real analysis. Topics include introductory proof writing, the real number system, limits, continuity, properties of real-valued functions, differentiation and elementary theory of integration.
Prerequisite: MATH2025 (4 credits)

MATH4900 PARTIAL DIFFERENTIAL EQUATIONS
An introductory course in partial differential equations which covers the methods of characteristics, separation of variables, Fourier Series, finite differences, Fourier Transforms and Green's Functions. Prerequisite: MATH2500 (4 credits) fall

MATH4950 DYNAMICAL SYSTEMS AND CHAOS
Introduction to dynamical systems and chaos with emphasis on applications in science and engineering. Topics include one-dimensional flows (fixed points, stability and bifurcations), two-dimensional flows (phase planes, limit cycles, and bifurcations), and chaos (lorenz equations, maps, fractals and strange attractors). This course counts as a technical elective for applied mathematics majors and minors. Prerequisite: MATH2500 (4 credits)

MATH4975 REAL ANALYSIS II
Continued introduction to real analysis. Topics include sequences, series, Fourier series, functions defined by integrals, improper integrals, Riemann-Stieljes integrals, functions of bounded variation, fixed-point theorems, implicit function theorems, Lagrange multipliers, functions on metric spaces, approximation, Green's Theorem and Stokes' Theorem for real vector fields. Prerequisite: MATH4875 (4 credits)

MATH5000 APPLIED MATHEMATICS FINAL YEAR DESIGN I
Student will work alone and in small group projects to study, analyze, design, and sometimes build and test concepts in an applied mathematics subfield of their choosing. The study will be performed under the direction of one or more faculty advisors. Projects from industry be encouraged to increase the interaction and cooperation with firms. Course requirements include regular oral and written progress reports throughout the semester. The final technical report by students may include a plan for the following Applied Mathematics Final Year Design II course. Prerequisite: Final year standing in BSAM program (4 credits) fall

MATH5500 APPLIED MATHEMATICS FINAL YEAR DESIGN II
This course is a continuation of Applied Math Final Year Design I. Students will continue with their design and analysis (or with new designs and analysis) with emphasis on improvements and applications. Other faculty and local industry professionals will review the student work and make recommendations. (4 credits) summer
Mechanical (MECH)

MECH2000 ENGINEERING STATICS
The vector approach of the equilibrium of particle and rigid bodies is presented. Trusses, frames, shear and bending moment diagrams, centroids and moments of inertia are studied. **Prerequisites:** MATH1850 or MATH1875; and PHYS1250 (4 credits)

MECH2250 ENGINEERING THERMODYNAMICS I
Thermodynamics properties, work and heat interaction are defined. The First and Second laws of thermodynamics are introduced. Conservation of mass and energy and the entropy and the exergy balance relations are applied in analyzing thermodynamic systems. Alternative energy sources and fuel cells are discussed. Psychrometric applications in the air conditioning processes are covered. Laboratory experiences reinforce the classroom theory. **Prerequisites:** MATH1850 or MATH1875; and PHYS1750 (4 credits)

MECH2300 ENGINEERING GRAPHICS
Basic concepts of engineering graphics, design and sketching, tolerance analysis and ANSI standard drawings are explored using CAD (3 credits)

MECH2500 MECHANICS OF MATERIALS
The concepts of stress and strain and their relation are introduced. Axially loaded members, temperature effect, torsion, bending, combined loading and stress transformations are studied. Stability and buckling of columns are discussed. Laboratory experiences reinforce classroom theory. **Prerequisite:** MECH2000 (4 credits)

MECH2600 MECHANICAL DESIGN & ANALYSIS
This 3-D Computer Aided Design course provides experience in mechanical engineering design and analysis. Assembly component interface tolerance analysis to ensure manufacturability of designs and basic finite element analysis of parts and assemblies are conducted. **Prerequisites:** MECH2000 and MECH2250 and MECH2500 and ENGR1800 (3 credits)

MECH2750 ENGINEERING THERMODYNAMICS II
Studies vapor power systems including the Rankine cycle and its modifications for use with both fossil and nuclear fuels, vapor compression refrigeration systems, and all-gas cycles including the Brayton cycle and its modifications; the Otto cycle; the Diesel cycle; and supercharging and turbocharging. Introduces the concepts of exergy and second law efficiency. Studies non-reacting mixtures with applications to air/water/vapor mixtures for air conditioning systems and cooling towers. Discusses the elements of optimum power plant design. Laboratory experiences enforce the classroom theory. **Prerequisite:** MECH2250 (4 credits)

MECH3000 DESIGN OF MACHINE ELEMENTS
This course covers the basic concepts and principles in the design and analysis of machine components. The analysis in design is based on the traditional stress analysis from mechanics of materials and also on the finite element formulation based on theory of elasticity. Plane stress, three-dimensional stress and strain, combined stresses, failure criteria and reliability, fatigue, are considered in the analysis of machine elements: rolling bearings, spur gears, flexible elements, and shafts. **Prerequisite:** MECH2500 (4 credits)

MECH3025 SCANNING ELECTRON MICROSCOPY: IMAGING, ANALYSIS AND EVALUATION
This course will look at the use of fundamental physics and chemistry principles as a basis for advanced analysis of biological and synthetic objects. An integrated approach of on-line research, lecture, demonstration, and student exploration along with optical and scanning electron microscopy (SEM) will be used to verify findings. Physical and elemental details that cannot normally be seen will be imaged and evaluated to gain an understanding of how naturally occurring and engineered products are developed. Based on student interest, additional analysis techniques will also be presented. **Prerequisites:** CHEM1100 and PHYS1250 (4 credits)

MECH3050 FUNDAMENTALS OF HVAC SYSTEMS
Moist air properties and air conditioning processes will be covered through theory, Psychometrics chart and Laboratory experiment. Building maximum heat loss (heating load in winter) and heat gain (cooling load in summer) calculations will be discussed along with different heating and cooling systems and subsystems such as hot air, hydronic, vapor compression, absorption Refrigeration Cycles. Degree-day and bin methods to estimate building energy consumption will be covered. **Prerequisite:** MECH2250 (4 credits) summer

MECH3100 ENGINEERING FLUID MECHANICS
Mechanics of fluids with emphasis on control volume analysis are studied. The continuity, energy and momentum principles are applied to real fluids. Additional emphasis is on electromechanical systems and laboratory exercises. **Prerequisites:** MATH2025 and MECH2250 (4 credits)

MECH3200 NUMERICAL SIMULATION & CFD
This is an advanced new undergraduate and graduate course that explores the fundamentals of different engineering problems with different simulation techniques and CFD. The course will present several important topics such as modeling techniques and CFD. The topics will cover different techniques to solve multidisciplinary engineering problems. The basic knowledge will be applied to typical problems in aerospace and different engineering applications. **Prerequisites:** MECH3100 and MECH2300 (4 credits)

MECH3250 INTERMEDIATE MATLAB
The goal of this course is to develop the skills and confidence to use MATLAB as an effective tool in solving engineering problems. The basics of MATLAB will first be reviewed and the expanded upon. A variety of topic will be covered, including object-oriented programming, solving ordinary and partial differential equations, creating GUI’s, the use of plot handles, and writing efficient code. **Prerequisites:** ENGR1800 and MATH2500 (3 credits)

MECH3350 GAS DYNAMICS
This course is an introductory course to the subject of applied Gas Dynamics where the effect of compressibility on fluid flow is introduced. It starts with some basic notions of fluid flow and thermodynamics followed by one dimensional compressible flow. Normal and oblique shock waves. Construction and design of aircraft gas turbine engine. Simulation and CFD analysis of compressible flow and convergent-divergent nozzles. **Prerequisites:** MECH3200 (4 credits)

MECH3400 RELIABILITY-BASED MECHANICAL DESIGN
Techniques for the quantification of uncertainty and risk inherent in mechanical components and systems; and the implementation of reliability-based design in mechanical components and systems. (4 credits) **Prerequisite:** MECH3000
MECH3599 ENGINEERING MECHANICS
This course covers static equilibrium and dynamic motion. Major components of this course are force vectors, equilibrium of a particle, resultant and internal forces, centroids, center of gravity, stress and strain, torsion, moments of inertia, shearing, deflection, kinematics of a particle, kinetics of a particle, force, acceleration, work and energy, impulse and momentum. The course includes labs that correspond to the lecture material. Prerequisites: MATH2025 and PHYS1750 (4 credits)

MECH3600 MATERIALS SCIENCE
This is an introductory course into the structure and properties of materials. Subjects include the processing of materials, crystal structure, Miller indices, composition, alloying, electrical properties, phase diagram, corrosion, diffusion, heat treating, inspection, and testing of materials utilized in the electromechanical field. The laboratory activities will reinforce the classroom theory. Prerequisite: Junior status and MECH2500 (4 credits)

MECH3650 AERODYNAMICS
This course is an introductory course to the subject of Aerodynamics. Fundamentals physical quantities and the source of all aerodynamics forces, continuity, momentum and energy equations. Measurement of airspeed: incompressible flow, subsonic compressible flow, supersonic flow. Introduction to viscous flow, laminar and turbulent boundaries, transition, flow separation. Airfoils, wings and other aerodynamic shapes. Elements of airplane performance, equations of motion, thrust, power and maximum velocity. Principles of stability and control (static and dynamic stability, control), moments on the airplane, absolute angle of attack. Prerequisites: MECH3350 (4 credits)

MECH3800 SPECIAL TOPICS IN MECHANICAL ENGINEERING
Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (1 - 4 credits)

MECH3850 ENGINEERING DYNAMICS
This course covers the kinematics and kinetics of particles and rigid bodies. Kinetic problems are analyzed by utilizing the second law of Newton, work and energy and impulse momentum methods. Dynamics simulation software is used to reinforce the theory. Prerequisites: MECH2000 and MATH2500 (4 credits)

MECH3900 ENGINEERING HEAT TRANSFER
Conduction, convection, and thermal radiation heat transfer mechanisms are described. Steady-state and transient conduction problems are discussed. Convective heat transfer mechanisms and various correlations to evaluate the heat transfer coefficient are discussed. Heat exchanger analysis and thermal radiation heat transfer between surfaces are presented. Prerequisites: MECH2250 and MECH3100 and MATH2500 (4 credits)

MECH4000 MECHANICAL VIBRATION
General theory of free, damping and forced vibrations with one and two degrees of freedom; vibration suppression and isolation; natural frequencies and mode shapes in continuous mechanical systems through analytical method and numerical simulation. Prerequisites: MATH2500 and MECH2500 and MECH3850 (3 credits)

MECH4200 SIMULATION BASED DESIGN
This 3-D computer aided design course provides experience in mechanical engineering simulation and design verification analysis. Finite Element Analysis of parts and assemblies are conducted. Prerequisites: MECH3000 and MECH3100 and MECH3900 (4 credits)

MECH4400 ENGINEERING THERMAL DESIGN
Studies vapor power systems including the Rankine cycle and its modifications for use with both fossil and nuclear fuels, vapor compression refrigeration systems, and all-gas cycles including the Brayton cycle and its modifications; the Otto cycle; the Diesel cycle; and supercharging and turbocharging. Introduces the concepts of energy and second law efficiency. Studies non-reacting mixtures with applications to air/water/vapor mixtures for air conditioning systems and cooling towers. Discusses the elements of optimum power plant design. Laboratory experiences enforce the classroom theory. Prerequisites: MECH2250 and MECH3100 and MECH3900 (3 credits)

MECH4425 ADVANCED MECHANICS OF MATERIALS
Stress analysis, the development of strain, stress concentrations, failure theories and fatigue are studied. Shafts, gears, and other elements are also considered. Laboratory problems and appropriate projects are assigned. Prerequisites: MECH2500 and ELEC2850 and MATH2025 and MATH2100 (4 credits)

MECH5000 MECHANICAL ENGINEERING CAPSTONE ANALYSIS
This capstone research-based course is for senior-level mechanical engineering students who will formulate a topic and initiate their capstone project for an innovative technological device or system. Students are encouraged to take an interdisciplinary approach to their design project with research directed by one or more faculty advisors. Prerequisite: Senior status (3 credits)

MECH5500 MECHANICAL ENGINEERING CAPSTONE PROJECT
This capstone project course is for senior-level mechanical engineering students who will formulate a topic and develop a project for an innovative technological device or system. Students are encouraged to take an interdisciplinary approach to their design project, and the work will be performed under the direction of one or more faculty advisors. Course requirements include oral and written progress reports throughout the semester plus a final comprehensive technical report. Prerequisites: Senior status and MECH4200 (4 credits)

Philosophy (PHIL)

PHIL3800 SPECIAL TOPICS IN PHILOSOPHY
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the semester schedule for the courses offered that semester. Contact the faculty assigned for more information about the course topic. Prerequisite: Completion of an English Sequence (4 credits)

PHIL4301 PHILOSOPHY AND RELIGION
An introductory course in the concepts and processes of philosophical and religious thought and experience. In this course students will be able to examine the classical and contemporary traditions and issues in philosophy and religion, the nature of existential reality, and the process of ethical decision-making. Prerequisite: Completion of an English Sequence (4 credits)

PHIL4401 ENGINEERING ETHICS
This course examines several ethical systems and employs a case study approach to apply these systems to the scenarios that engineers may encounter. A major focus of this course is examining possible future technological developments and their impact on humanity. Prerequisite: Completion of an English Sequence (4 credits)
PHIL4501 ETHICS
The study of the rules and standards of right conduct in regard to the self, industry, and society. Historical perspectives and contemporary case studies are utilized. **Prerequisite:** Completion of an English Sequence (4 credits) fall, spring, summer

PHIL4525 VIRTUAL ETHICS
This course will explore the impact of information technology on the individual and society. It will address questions regarding freedom, privacy, justice and human flourishing in an information age. Topics including the ethics of technology design, social media, networked environments and virtual realities, gaming, robotics and artificial intelligence will shed light on the new ethical question that challenge our evolving symbiotic relationship with technology. We will conduct our study of “virtual ethics” through primary and secondary readings, including scholarly articles and literature as well as narrative films. **Prerequisite:** Completion of an English Sequence (4 credits)

PHIL4600 DESIGNING THE GOOD LIFE
This course explores the impact on human flourishing, that is, design’s influence on our ability to live a “good life.” We will explore how the design of the world around us (its physical space, its artifacts, its practices and social structures) affects the kinds of people we are 9 our character) and the moral quality of our lives. We will first explore different ideas of what make for a “good life.” To what degree is a good life unique to each individual? To what degree is it the same for all human beings? Then we will analyze and critique different spaces, artifacts and practices looking closely at how their design promotes and/or hinders human flourishing. This course concludes with student teams designing and leading a class session a design topic of the teams choosing. **Prerequisites:** Completion of an English Sequence (4 credits)

Physics (PHYS)

PHYS1000 COLLEGE PHYSICS I
General introduction to mechanics. Topics include kinematics, vectors, Newton’s Laws, equilibrium, work and energy, momentum, and circular motion. **Prerequisite:** MATH1000 (4 credits) fall, spring, summer

PHYS1005 PHYSICS A
General introduction to mechanics, including Newton’s Laws, equilibrium, work, energy and momentum. The laboratory work will support the concepts studied in class. **Prerequisite:** MATH1005 (3 credits) fall, spring, summer

PHYS1010 CONCEPTUAL PHYSICS
A survey of physics and its applications to modern life. Mechanics, sound, heat, electricity, light, and structure of matter are examined. Understanding of concepts, rather than detailed calculations, is emphasized through lecture and laboratory. (4 credits) fall, spring

PHYS1035 PHYSICS B
General introduction to mechanical and thermal properties of matter, sound, light, and electricity. The laboratory work will support the concepts studied in class. **Prerequisites:** PHYS1005 (3 credits) fall, spring

PHYS1100 THE COSMIC SYSTEM
This course provides a tour of the universe from our own Sun and solar system to the very edge of space and time itself. Topics include the 8 planets, our Sun and the structure of stars, nuclear fusion as a stellar energy source, stellar evolution, the Milky Way galaxies and galaxy formation, large scale structure, and the fate of the universe. We finish with a discussion of exoplanets and the possibility of other life in the universe. No prior knowledge of astronomy is necessary. (3 credits)

PHYS1250 ENGINEERING PHYSICS I
A calculus-based course emphasizing the principles and applications of mechanics. Topics include: Newton’s Laws, equilibrium; work, energy, power; momentum, circular motion. **Corequisite:** MATH1750 or MATH1775 (4 credits) fall, spring, summer

PHYS1500 COLLEGE PHYSICS II
Physical properties of solids and fluids, heat, sound, light, electric, and magnetic forces. **Prerequisites:** MATH1500 and PHYS1000 (4 credits)

PHYS1750 ENGINEERING PHYSICS II
Topics include: physical properties of solids and fluids, atomic structure, heat, sound, wave motion, electricity and magnetism. **Prerequisites:** PHYS1250; and MATH1750 or MATH1775; **Corequisite:** MATH1850 (4 credits) fall, spring, summer

PHYS2000 INTRODUCTION TO ASTRONOMY
This course gives the student a tour of the universe, from our own Sun and Solar System to the very edge of space and time itself. Topics will include: the 8 planets; our Sun and the structure of stars, nuclear fusion as a stellar energy source; stellar evolution; the Milky Way galaxies and galaxy information; large scale structure; and the fate of the universe. No prior knowledge of astronomy is necessary (4 credits)

PHYS2990 INDEPENDENT STUDY IN PHYSICS
This course investigates a topic of special interest to faculty and students that is outside existing course offerings. **Prerequisite:** Consent of department head and instructor (1 - 4 credits)

PHYS3000 COMPUTATIONAL PHYSICS
Numerical and computational methods and techniques applied to a variety of physics topics. Use of computers to numerically solve problems and graphically illustrate solutions involving differential equations. Integration, matrices and root finding. **Prerequisites:** PHYS1750 and MATH1850 (4 credits) fall

PHYS3100 MODERN PHYSICS
This course takes a student on a journey of the physics after 1905. Emphasis is placed on the shortcoming of classical physics at the turn of the century leading to the discoveries of the modern era. The special theory of relativity and foundations of quantum mechanics serve as the cornerstone of the course. Extensions of these topics will include the modern view of the atom, nuclear physics, wave-particle duality of light and mass, space time structure and GPS implementation of relativity. The emphasis of the class is to gain a strong mathematical and conceptual understanding of post-Newtonian physics and its applications as well as the development of specific problem solving skills, including the use of calculus, differential equations, and linear algebra. **Prerequisites:** MATH1850 or MATH1875; and PHYS1750 (4 credits)

PHYS3500 THERMAL PHYSICS
This course introduces the fundamental principles of thermodynamics, examining the relationship between temperature, heat, work, and energy. Topics include the laws of thermodynamics, heat engines and ideal gases. **Prerequisites:** MATH1850 or MATH1875; and PHYS1750 (4 credits) summer

PHYS3600 CLASSICAL MECHANICS
This course emphasizes the systematic approach to the mathematical formulation of the principles of Newtonian mechanics. The fundamental concepts and principles will be applied to particles, system of particles and rigid bodies. Topics will include oscillatory motion, noninertial reference frames, Lagrangian and Hamiltonian dynamics, gravitation, central force motion, and dynamics of system of particles. **Prerequisites:** MATH2500 and PHYS1750 (4 credits) fall
PHYS3800 SPECIAL TOPICS IN PHYSICS
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the semester schedule for the courses offered that semester. Contact the faculty assigned for more information about the course topic. (1 - 4 credits)

PHYS4500 INTRODUCTION TO QUANTUM MECHANICS
This course serves as an introduction to quantum mechanics. Students will be introduced to the mathematics necessary to understand and solve problems in quantum mechanics. The time independent Schrödinger equation will be discussed and solved to determine the quantum wavefunction for a number of different one-dimensional potentials. Quantum observables will be introduced and calculated by applying linear operators to particles wavefunctions. Realistic quantum systems such as the hydrogen atom will be explored to demonstrate how quantum mechanics shapes the nature of atomic matter. Particle spin will be used as an example of a two-state quantum system leading to an investigation of quantum entanglement. Prerequisites: MATH2500 and PHYS3100 (4 credits) summer

PHYS4700 ELECTRODYNAMICS
This course is designed to build on topics first investigated in PHYS 1750 in a more advanced and rigorous manner. Students will be introduced to vector calculus and its application to Maxwell's equations. Topics will include but are not limited to Electrostatics, Laplace's equation, Dielectrics, Magnetostatics, and Electrodynamics. Prerequisites: PHYS3100 (4 credits)

Political Science (POLS)

POLS1201 POLITICAL SCIENCE (CPCE)
Study of the use of power in society. The course introduces the student to the nature of political systems at the local, state, national, and international levels. Prerequisite: ENGL1050 (3 credits)

POLS1350 AMERICAN GOVERNMENT (CPCE)
This course covers the concept of citizenship in the community and the nation. Basic political concepts, governing philosophies, and contemporary governmental structures as they pertain to public policy development are studied. Prerequisite: ENGL1050 and ENGL2050 (3 credits)

POLS3800 SPECIAL TOPICS IN POLITICAL SCIENCE
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the semester schedule for the courses offered that semester. Contact the faculty assigned for more information about the course topic. Prerequisite: Completion of an English Sequence (4 credits)

POLS4102 AMERICAN GOVERNMENT
This course provides students with an overview of American democracy. Basic political concepts, governing philosophies, and contemporary governmental structures as they pertain to public policy development are studied. In addition to addressing the important role of institutions, politics and the role of non-state actors will be a central component of class discussion. Most importantly, this course seeks to empower students as citizens in a democratic society, and develops the concept of citizenship in the community and the nation. Prerequisite: Completion of an English Sequence (4 credits)

POLS4300 RACE, CLASS & GENDER POLITICS
This course provides perspectives on identity politics, the complex interaction between the categories of race, class, gender and ethnicity. We will examine the role that race, class, gender and ethnicity play in our politics on a personal, local and national level. In addition to historical and current readings, we will also discuss a foundation on which to conduct analysis of the intersections among issues of race, class and gender. Prerequisite: Completion of an English Sequence (4 credits)

POLS4350 SCIENCE & TECHNOLOGY POLICY
This course introduces students to science and technology policy generally, an in particular, it considers the concepts, actors, processes and challenges involved with promoting innovation while regulating new technologies. How do we ensure the protection of public health and safety without dampening innovation? What is the role of government in all of this? What should it be? What are the current scientific questions that are challenging policymakers? Prerequisite: Completion of an English Sequence (4 credits)

POLS4402 INTERNATIONAL POLITICS
A course designed to analyze how nation states interact in the contemporary world. Basic concepts such as sovereignty, national interest and diplomacy will be studied and assessed in relation to the conduct of foreign policy. Case studies will be used to examine and understand the process of modern decision-making and the intelligence and diplomacy upon which it is based. A basic knowledge of modern history or government is recommended. Prerequisite: Completion of an English Sequence (4 credits)

POLS4450 INTERNATIONAL RELATIONS & SCIENCE FICTION
Students will come away from this course with an understanding of the international political system and the ability to apply a general conceptual framework and theoretical tools to interpret, analyze and evaluate issues and events in international politics. The twist is that we will be using science fiction - notably the idea of a zombie apocalypse, but also other films and pop culture references - to illustrate important concepts. Prerequisite: Completion of an English Sequence (4 credits)

POLS4452 THIRD WORLD STUDIES
A course by which a student may enlarge his or her knowledge and understanding about the history and traditions of sub-Asia, Africa and Latin America. The purpose of this course is to prepare students for employment in multi-national corporations with overseas divisions and for technical assistance projects in emerging nations. Prerequisite: Completion of an English Sequence (4 credits)

POLS4475 INTERNATIONAL SECURITY
This course introduces students to the concepts and theories of international security as well as the ongoing threats worldwide. We consider the policies and politics of international security and how states engage with each other through both war and diplomacy. The course will address traditional threats (including terrorism and weapons of mass destruction), but also new threats to human security (such as international environmental and health threats). Throughout the course, special attention will be given to the ways in which technology plays a role both in creating and mitigating these threats. Prerequisite: Completion of an English Sequence (4 credits) summer

POLS4502 MEDIA & POLITICS
This course considers the critical role played by the media in democratic political systems. Students will explore the ways in which the media portrays government processes and officials and shape agendas and public opinion. Sources of bias, regulation, and censorship, as well as the role of new medial and political satire are also explored. Prerequisite: Completion of an English Sequence (4 credits)
Prior Learning Assessment Prep (CPLA)

CPLA1000 PRIOR LEARNING ASSESSMENT PREPARATION
Students analyze their life and work experience to discover the college-level learning that they have acquired since completing high school. Students write essays detailing how the learning was acquired and equivalent to the learning objectives of related Wentworth courses. Students must present evidence of the learning described in their essays. The evidence must include letters of support from witnesses to the learning described in the essay and may include other forms of documentation. To complete the course, students must present to the instructor the required material in a carefully prepared e-portfolio within the Wentworth LMS system. Upon course completion, a student may elect to have that portfolio submitted to the Portfolio Review Committee for assessment. The committee determines whether the learning outcomes articulated and documented in the portfolio of essays and evidence is equivalent to the learning represented in the corresponding college syllabi or course descriptions. (3 credits)

Psychology (PSYC)

PSYC3750 PSYCHOLOGY OF ADULTHOOD (CPCE)
This course presents an overview of the theoretical and practical aspects of adult psychological development and aging. Topics covered are: relationships, careers, midlife, retirement and death. **Prerequisite:** ENGL1050 and ENGL2050 (3 credits)

PSYC3800 SPECIAL TOPICS IN PSYCHOLOGY
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the semester schedule for the courses offered that semester. Contact the faculty assigned for more information about the course topic. **Prerequisite:** Completion of an English Sequence (4 credits)

PSYC4100 INTRODUCTION TO PSYCHOLOGY
An introduction to psychology, with an emphasis on the role it plays in our everyday lives. Topics include human development, the biological basis of our behavior, the nature of intelligence and consciousness, psychological disorders, and how we behave in social situations. **Prerequisite:** Completion of an English Sequence (4 credits)

PSYC4160 SPORTS PSYCHOLOGY
A psychological perspective on sports, emphasizing the experience of those who have broken barriers, or who seek to. After a general introduction to the field of sports psychology, students will read case studies, autobiographical and biographical accounts, and scholarly research related to issues of gender, race/ethnicity, and disabilities. Topics will illustrate common psychological concepts, such as stereotype threat and identity formation. **Prerequisite:** Completion of an English Sequence (4 credits)

PSYC4202 ABNORMAL PSYCHOLOGY
The systematic study of a variety of psychological disorders and troublesome problems of behavior. Attention will be given to the recognition of various symptoms and behaviors, several treatment methods, and preventive mental health measures for affected individuals and families. **Prerequisite:** Completion of an English Sequence (4 credits)

PSYC4250 PSYCHOLOGY & PSEUDOSCIENCE
A pseudoscience is a false science, not supported by what is generally called “a scientific method.” The discipline of psychology has long struggled with the association with pseudoscience, yielding many rich historical and contemporary cases for analysis. This course will explore the relationship between psychology and pseudoscience, including the complex role that the media has played in confusing and promoting the two. **Prerequisite:** Completion of an English Sequence (4 credits)

PSYC4302 SOCIAL PSYCHOLOGY
This course goes beyond an introductory course in psychology or sociology to examine the nature of social interaction in depth. The biological and cultural roots of interaction; the structure and dynamics of groups and organizations; social exchange and competence; social space and distance; evaluation of self and others; verbal and non-verbal communication; and similar topics are considered. **Prerequisite:** Completion of an English Sequence (4 credits)

PSYC4350 PSYCHOLOGY OF PLACE
What role does place play in the establishment of our identity? How do the spaces we create and inhabit tether us to ourselves, or perhaps something greater than ourselves? Social scientists are not only interested in the relationships we form, but also with the way our natural and designed surroundings influence our thoughts, feelings and behaviors. In this course, we will explore such topics, including how place affects our sense of wellness. (4 credits) **Prerequisite:** completion of an ENGL sequence

PSYC4552 INDUSTRIAL ORGANIZATION PSYCHOLOGY
By establishing the link between theory and application, this course enables the student to study the psychological principles that emerge in technology and business environments. Topics covered include leadership, communication, organizational culture, motivation, attitude, and stress. **Prerequisite:** Completion of an English Sequence (4 credits) fall, spring, summer

Science

SCIN2000 SCIENTIFIC INSTRUMENTATION
This course is a lab-intensive course that focuses on instrumentation and experimental methods in the three scientific disciplines: biology, chemistry and physics. In addition, students receive training in experimental design, critical data analysis and scientific writing. The semester is divided into multi-week modules, where students apply standard techniques used in each discipline. The final module will be designated for the design and execution of a project that utilizes skills from at least two discipline-specific modules. **Prerequisites:** BIOL1100, CHEM1100, and PHYS1250; **Corequisite:** MATH1850 or MATH1875 (4 credits) spring

SCIN2500 SCIENTIFIC COMPUTING
This course teaches students to utilize computational methods & techniques to solve a variety of problems in biology, chemistry and physics. Students will implement mathematical models and numerical techniques using various software and programming languages such as Excel, MATLAB and Python. **Prerequisites:** MATH2500 and BIOL2200; CHEM1600 or PHYS1750 (4 credits) summer
SCIN5000 SENIOR CAPSTONE I
This course is a two semester capstone series for Applied Science students. Students work under the guidance of one or more faculty to design and conduct an interdisciplinary research project based on the sciences of biology, chemistry and physics. Students explore the history, background and scientific relevance of the chosen project by conducting literature searches. Students practice scientific writing by submitting an abstract describing the proposed project in addition to writing a scientific research proposal. Students are expected to obtain preliminary results of their proposed project either by conducting experiments or by applying theoretical/computational calculations. Prerequisite: Senior standing in Applied Science (4 credits) spring

SCIN5500 SENIOR CAPSTONE II
This is the second course of a two semester capstone series for Applied Sciences students. Students continue working alone or in groups on the research projects established in SCIN5000. The work is conducted under the supervision of one or more science faculty instructors based on the previously arranged schedule from SCIN5000. Course requirements include regular verbal and written progress reports throughout the semester, a final technical research paper and a professional oral presentation of the project results. Prerequisite: SCIN5000 (4 credits) summer

Sociology (SOCL)

SOCL1051 SOCIOLOGY (CPCE)
This course is an introduction to sociology, the systematic study of human groups and social relations. We will analyze the basic structure of society and the issues confronting contemporary life in America. Special emphasis will be placed upon the problems and concerns that bring about change in modern society. Prerequisite: ENGL1050 (3 credits)

SOCL3800 SPECIAL TOPICS IN SOCIOLOGY
These courses present topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the semester schedule for the courses offered that semester. Contact the faculty assigned for more information about the course topic. Prerequisite: Completion of an English Sequence (4 credits)

SOCL4102 SOCIOLOGY
This course explores sociology, the systematic study of groups and social relations. Sociology investigates the intersection of biography and history by relating the life of the individual to the operation of social institutions; how a person's life interacts with the collective experience of others. We will analyze the basic structure of society and the issues confronting contemporary life in America. Special emphasis will be placed upon forces and problems that bring about cultural change in American society today. In addition, we shall broaden our perspectives to include issues of globalization. Prerequisite: Completion of an English Sequence (4 credits)

SOCL4212 ART & TECHNOLOGY
This course explores the disappearing line between nature and technology. Themes and topics explored include: art history with an emphasis on Modernism and contemporary art; the literature of Hawthorne and Zizek; relationship between nature, culture and science; cyborgs, plastic surgery, and immortality; the importance and effects of ideas and inventions on society. Prerequisite: Completion of an English sequence (4 credits)

SOCL4252 FOOD IN AMERICAN HISTORY
A study of the history of food production, consumption and culture in America from the settlement era to the present. Students will analyze the relationships among food and race and ethnicity, socio-economic class, gender, and regionalism at different periods in American history. Prerequisite: Completion of an English sequence (4 credits)

SOCL4302 CRIMINOLOGY & JUSTICE STUDIES
This course will provide an introduction to the field of criminology. It examines the nature of criminal law, the social distribution of crime, casual explanations for criminal behavior, and selected types of crime. The main objective of the course is to expose students to theories, methods, and research findings in contemporary criminology. Prerequisites: Completion of an English sequence (4 credits)

SOCL4332 SOCIAL PROBLEMS
What is a social problem? How does a particular social phenomenon become defined as a social problem? These are the types of questions that this course will begin to answer. This course will provide an analysis of some of the most significant social problems in the United States, and other nations, including: poverty, homelessness, racism, segregation, health, and environmental destruction. We will examine the social and structural factors associated with the creation of these and other problems as well as ways to address and overcome them. We will pay particular attention to how issues become defined as social problems, who gets to define them, and the implications that these problems have for society and its members. Using a sociological perspective, we will delve deeper into these issues to gain a better understanding of their causes and possible solutions and how people experience and make sense of these issues. By the end of the course, you should come away with a better understanding of what constitutes a social problem and possible ways of addressing and solving them. Prerequisite: Completion of an English Sequence (4 credits)

SOCL4432 MARRIAGE AND FAMILY
This course explores marriage and families from a sociological perspective. The goal of Sociology, as a social science, is to better understand social institutions through the use of empirical research. In this course we will examine current and historical patterns in family formation, theoretical perspectives on family processes, how social policy shapes and influences family life, and the role of family in contemporary American society. Using readings, films, and class discussions, we will explore a myriad of issues related to family life including: gender, parenting, adoption, divorce, family diversity, family violence, and more. Finally, we will examine the social construction of family and explore how cultural contexts and social forces help shape our ideas and beliefs about what family should be and how individual agents work to reshape families. Prerequisite: Completion of an English Sequence (4 credits)

Surveying (SURV)

SURV1000 CONSTRUCTION SURVEYING
Instruction is given in the theory and techniques of horizontal and vertical measurements using the tape, transit and level. Laboratory exercises will focus on the application of these techniques as they relate to the building industry, including construction layout and grades. Prerequisite: MATH1005 (4 credits)
SURV1100  OVERVIEW OF SURVEYING TECHNOLOGY
This course will introduce the student to the various methods and applications of land surveying to the real estate, construction, and land development industries. Students will also be introduced to the various technologies employed by Professional Land Surveyors in accomplishing their work including differential leveling, electronic distance measurement (EDM), electronic data collection, computer-aided design (CAD), the global positioning system (GPS) and geographical and land information systems (GIS/LIS). Prerequisite: ENGL1050 or ENGL1100 (3 credits)

SURV1200  SURVEYING MEASUREMENT I
This course will introduce the student to the fundamental theories and techniques for horizontal and vertical measurements with theodolites, automatic levels and steel tapes. Labs include projects in linear measurements, leveling, traversing and stadia surveys. Prerequisite: MATH1065 (4 credits)

SURV1500  LEGAL ASPECTS OF LAND SURVEYING I
This course includes an introduction to the realm of real estate law that is essential to the practice of land surveying and the basics of land surveying research. Real estate law and conveyancing terminology, evidence gathering, and research theory will be taught. Key principles of boundary law will be explored such as the relative weight of evidence, sequential and simultaneous conveyances, easements and rights of way, and the public land survey system. Prerequisites: ENGL1050 or ENGL1100; and SURV1200 (3 credits)

SURV2200  SURVEYING MEASUREMENT II
This course includes traverse calculation, and error analysis, applications of coordinate geometry, horizontal and vertical curve calculations, introduction to geodetic survey principles, basic map projection calculations, and introduction to, and use of, data collection equipment and software. Labs include layout of horizontal and vertical curves, field techniques for boundary layout, data collection and site detail mapping. The final project in this course will involve the detailed surveying and mapping of a section of the campus suitable for use in engineering design, construction or conveyancing. Prerequisite: SURV1200 (4 credits)

SURV2250  MA. REGULATIONS AFFECTING SURVEYING PROFESSIONALS
This course will involve the study of those regulations directly affecting the practice of Land Surveying in the Commonwealth of Massachusetts such as the Registration Law, (MGL Chap. 112, Secs. 81D-81T), the Regulations of the Board of Registration of Professional Engineers and of Land Surveyors (250 CMR), the Subdivision Control Law (MGL Chap. 41), the Zoning Act, (MGL Chap 40A) and the Massachusetts Land Court Manual of Instructions. Students will be introduced to other bodies of regulations often encountered in the practice of Land Surveying such as municipal subdivision regulations, The Wetlands Protection Act, The Massachusetts Environmental Protection Act (MEPA). Prerequisite: ENGL1100 or ENGL1050 (3 credits)

SURV2500  LEGAL ASPECTS OF LAND SURVEYING II
Building on the principles taught in Legal Aspects of Land Surveying I, special boundary topics such as water boundaries, unwritten transfers, and writing legal descriptions will be covered along with the roles of statute and case law in the boundary decision process. Students will complete a final project that will involve the application of legal principles to an actual surveying problem requiring them to make boundary decisions involving conflicting evidence. Prerequisites: SURV1500 and SURV2200 (3 credits)

Technology Management (TMGT)

TMGT8000  STRATEGIC TECHNOLOGY FOR BUSINESS MANAGEMENT
The focus of this course will be on managing technology for strategic value. Topics covered will include developing business strategy, gaining competitive advantage, R&D allocations, product and process development, strategic partnerships, and the role of innovation. Developing and managing offshore technology operations directly or through partnerships will be examined. (3 credits)

TMGT8100  MANAGEMENT OF NEW PRODUCT DEVELOPMENT
This course uses a living laboratory learning environment to provide our students with experience along the entire spectrum of the commercialization process; from ideation, invention, product development, technical and market feasibility analysis, intellectual property acquisition and/or management, to business plan development and the search for capital. Protection of intellectual property across international borders will also be discussed. (3 credits)

TMGT8900  TECHNOLOGY MANAGEMENT CAPSTONE
The MSTM program culminates with a capstone course where students are called upon to demonstrate their ability to integrate information learned and skills developed throughout the program. Where possible, projects will be developed in collaboration with industry partners. (3 credits)
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