

2022-2023 ACADEMIC CATALOG

Wentworth Institute of Technology's online catalog provides descriptions of courses, majors and minors offered by academic units and programs, as well as other university-wide information such as the academic calendar, academic policies, facilities, financial aid and tuition costs.



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2022-2023 ACADEMIC CALENDAR

Undergraduate/Graduate

Fall 2022

Item	Day	Date
Faculty Days	Thursday & Friday	1-Sept-2022 & 2-Sept-2022
Classes Begin for 15-week & 1 st 7-week classes	Tuesday	6-Sept-2022
Last Day of Drop/Add for 15-week & 1 st 7-week classes	Tuesday	13-Sept-2022
December 2022 Graduates: Degree Applications Open on LeopardWeb	Wednesday	15-Sept-2022
April 2023 & August 2023 Graduates: Degree Applications Open on LeopardWeb	Thursday	29-Sept-2022
Indigenous Peoples' Holiday - No Classes	Monday	10-Oct-2022
Spring 2023 Course Schedule Available to Students	Tuesday	11-Oct-2022
Last Day to Withdraw from 1st 7-week classes with 'W' Grade	Tuesday	11-Oct-2022
Census	Friday	14-Oct-2022
Fall 2022 Final Exam Schedule Available to Students	Tuesday	18-Oct-2022
Incomplete Grades 'IC' Convert to 'F'	Tuesday	18-Oct-2022
Midterm Grades Due from Faculty - 3pm (15-week classes only)	Tuesday	18-Oct-2022
Midterm Grades Available on LeopardWeb - 9am (15-week classes only)	Wednesday	19-Oct-2022
Registration for Spring 2023 begins	Tuesday	25-OCT-2022
Last Day of Classes 1 st 7-week classes	Tuesday	25-OCT-2022
First Day of Classes 2 nd 7-week classes	Wednesday	26-Oct-2022
Final Grades Due from Faculty 1 st 7-week classes - 9am	Friday	28-Oct-2022
Final Grades Post to LeopardWeb-9am 1 st 7-week classes	Tuesday	1-Nov-2022
Last Day of Drop/Add for 2 nd 7-week classes	Wednesday	2-Nov-2022
Veterans Day Holiday – No Classes	Friday	11-Nov-2022
Last Day to Withdraw from Classes with 'W' Grade 2 nd 7-week classes & 15-week classes	Tuesday	22-Nov-2022
Thanksgiving Recess - No Classes	Wednesday - Saturday	23-Nov-2022 to 26-Nov-2022

Item	Day	Date
Classes Resume	Monday	28-Nov-2022
Last Day of Classes for 2{nd} 7- week classes and 15-week classes	Tuesday	6-Dec-2022
Study Day	Wednesday	7-Dec-2022
Final Exam Period	Thursday/Friday & Monday/Tuesday	8-Dec-2022 and 9-Dec-2022 & 12-Dec-2022 to 13-Dec-2022
Final Grades due from Faculty - 12pm	Friday	16-Dec-2022
Final Grades post to LeopardWeb - 9am	Tuesday	20-Dec-2022
Fall 2022 Academic Standing Notification to Students	Thursday	22-Dec-2022
University Holiday – All Offices Closed	Monday - Monday	26-Dec-2022 to 2-Jan-2023

Spring 2023

Item	Day	Date
University Opens	Tuesday	3-Jan-2023
Faculty Days	Thursday-Friday	5-Jan-2023 & 6-Jan-2023
Classes Begin for 15-week & 1 st 7-week classes	Tuesday	10-Jan-2023
MLK Holiday - No Classes	Monday	16-Jan-2023
Last Day of Drop/Add for 15-week classes & 1 st 7-week class	Tuesday	17-Jan-2023
Summer 2023 Course Schedule Available to Students	Tuesday	7-Feb-2023
Last Day to Withdraw from 1 st 7- week class with a "W" grade	Tuesday	7-Feb-2023
Census	Friday	17-Feb-2023
Presidents Day Holiday - No Classes	Monday	20-Feb-2023
Last Day of Classes for 1 st 7-week class	Tuesday	21-Feb-2023
Registration for Summer 2023 begins	Tuesday	21-Feb-2023
Incomplete Grades 'IC' Convert to 'F'	Tuesday	21-Feb-2023
Midterm Grades Due from Faculty - 3pm (15-week classes only)	Tuesday	21-Feb-2023
Midterm Grades Available on LeopardWeb - 9am (15-week classes only)	Wednesday	22-Feb-2023
First Day of Classes 2 nd 7-week classes	Wednesday	22-Mar-2023
Final Grades due from Faculty 1 st 7-week classes - 9am	Friday	24-Feb-2023
Final Grades Post to Students on LeopardWeb 1 st 7-week classes - 9am	Tuesday	28-Feb-2023
Fall 2023 Course Schedule Available to Students	Tuesday	28-Feb-2023

Item	Day	Date	Item	Day	Date
Spring 2023 Final Exam Schedule Available to Students	Tuesday	28-Feb-2023	Last Day to Drop/Add 2 nd 7-week classes	Friday	30-Jun-2023
Last Day of Drop/Add for 2 nd 7-week class	Wednesday	1-Mar-2023	July 4th Recess - No Classes	Monday-Wednesday	3-Jul-2023 to 5-Jul-2023
Spring Break	Saturday - Friday	4-Mar-2023 to 10-Mar-2023	Classes Resume	Thursday	6-Jul-2023
Registration for Fall 2023 begins Tuesday		21-Mar-2023	Last Day to Withdraw from 15-week & 2 nd 7-week classes with 'W' grade	Thursday	27-Jul-2023
Last Day to Withdraw from 15-week & 2 nd 7-week classes with 'W' Grade	Tuesday	4-Apr-2023	Last Day of Classes 15-week & 2 nd 7-week classes	Thursday	10-Aug-2023
Last Day of Classes for 15-week classes & 2 nd 7-week classes	Tuesday	11-Apr-2023	Study Day	Friday	11-Aug-2023
Study Day	Wednesday	12-Apr-2023	Final Exam Period (15-week classes only)	Monday - Thursday	14-Aug-2023 to 17-Aug-2023
Patriots Day – No Classes	Monday	17-Apr-2023	Commencement	Sunday	20-Aug-2023
Final Exam Period	Thursday-Friday & Tuesday & Wednesday	13-Apr-2023 to 14-Apr-2023 & 18-Apr-2023 to 19-Apr-2023	Final Grades Due from Faculty - 12pm (15-week & 2 nd 7-week classes)	Monday	21-Aug-2023
Commencement	Saturday	22-Apr-2023	Final Grades Post to LeopardWeb - 9am (15-week & 2 nd 7-week classes)	Wednesday	23-Aug-2023
Final Grades due from Faculty - 12pm	Monday	24-Apr-2023	Summer 2023 Academic Standing Notification to Students	Friday	25-Aug-2023
Final Grades post to LeopardWeb - 9am	Wednesday	26-Apr-2023			
Spring 2023 Academic Standing Notification to Students	Friday	28-Apr-2023			

Summer 2023

Item	Day	Date
Faculty Day	Wednesday	10-May-2023
Classes Begin 15-week & 1 st 7-week classes	Thursday	11-May-2023
Last Day of Drop/Add for 15-week & 1 st 7-week classes	Thursday	18-May-2023
Memorial Day Holiday - No Classes	Monday	29-May-2023
Summer 2023 Final Exam Schedule Available to Students (15-Week class only)	Thursday	15-Jun-2023
Last Day to Withdraw from 1 st 7-week classes with a 'W' grade	Thursday	15-Jun-2023
Census	Friday	16-Jun-2023
Juneteenth Holiday - No Classes	Monday	19-June-2023
Midterm Grades Due from Faculty - 3pm (15 week classes only)	Tuesday	20-Jun-2023
Midterm Grades Available on LeopardWeb - 9am (15-week classes only)	Wednesday	21-Jun-2023
Last Day of Classes 1 st 7-week	Thursday	22-Jun-2023
First Day of Classes 2 nd 7-week	Friday	23-June-2023
Final Grades Due from Faculty – Monday 12 pm (1 st 7-week classes)	Monday	26-Jun-2023
Final Grades post to LeopardWeb-9am	Wednesday	28-Jun-2023

ABOUT WENTWORTH

The University

For more than a century, Wentworth Institute of Technology has delivered a first-rate and highly relevant education to prepare graduates for rewarding careers. Along with close faculty mentorship, Wentworth has prepared students to work with industry-standard technology by employing one of the most effective practices in education: you learn something best by doing it. 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, non-profits, and government—have graduated since Wentworth opened its doors in 1911.

Wentworth consists of five schools: The School of Architecture and Design; The School of Management; The School of Computing and Data Science; The School of Engineering; and The School of Science and Humanities.

Wentworth offers bachelor's degrees in twenty-one (22) majors:

- Applied Mathematics
- Applied Science
- Architecture
- Biological Engineering
- Biomedical Engineering
- Business Management
- Civil Engineering
- Computer Engineering
- Computer Information Systems
- Computer Networking
- Computer Science
- Computer Science and Society
- Construction Management
- Cybersecurity
- Electrical Engineering
- Electromechanical Engineering
- Engineering
- Industrial Design
- Information Technology
- Interior Design
- Mechanical Engineering
- Project Management

Wentworth offers eleven (11) master's degree programs:

- Master of Architecture
- Master of Engineering in Civil Engineering
- Master of Science in Applied Computer Science
- Master of Science in Business Analytics
- Master of Science in Civil Engineering
- Master of Science in Computer Engineering
- Master of Science in Construction Management
- Master of Science in Data Science

- Master of Science in Electrical Engineering
- Master of Science in Facility Management
- Master of Science in Project Management

Wentworth offers twenty-five (25) minors and four (4) professional undergraduate certificates.

The university fields eighteen (17) 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 (2) 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 of the workforce, for their technical problem-solving skills, and for their educational preparation to adapt to changing technologies. More than 58% of Wentworth students are offered post-graduate, full-time employment by their co-op employers.

Wentworth's class schedule is a balance of modalities for the traditional undergraduate and graduate student, working professionals who seek to complete their undergraduate degree, earn a professional certificate, develop the updated skills and leadership necessary to advance personally and professionally, or earn a graduate degree.

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. This highly valuable collaboration 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 Institute was founded in 1904 through a bequest from Arioach Wentworth, a Boston merchant, and held its first classes in 1911.

Mission, Vision, and Values

Mission

Wentworth Institute of Technology, the university of opportunity, provides our diverse community of learners with access to educational programs responsive to evolving market needs. Through a uniquely effective, hands-on, experiential, and cooperative education approach, Wentworth prepares graduates who are future-focused and career-ready.

Vision

Placing the student at the center of what we do, our vibrant and diverse campus community of faculty, staff, and students, helps each member reach their greatest potential. We seek to maximize the value of our graduates' contributions to global society and their effectiveness as future leaders.

Strategic Pillars

Inclusive Excellence

We commit to the continuous development of a campus culture that is increasingly diverse, equitable, and inclusive. We strive to develop a campus where everyone feels valued and meaningfully supported toward reaching their full potential.

High-Value Learning

We commit to offering a high return on investment by providing an education that equips our graduates with knowledge that is coupled with a highly valued skillset. We accomplish this through opportunities to address real-world challenges, applied research, social impact projects, cooperative education, collaborative experiences, cross-cultural exchange, and the effective use of advanced technologies.

Transformative Student Experience

We commit to prioritizing the health and well-being of our students and providing opportunities in support of their growth and transformation. Our holistic approach includes an interconnection of high-value learning, with high-quality services, activities, programs, and opportunities that align with student needs, interests, goals, and aspirations.

Next Generation Partnerships

We commit to maximizing the mutual benefits of partnerships with industry, alumni, and various communities. Through these partnerships, we enhance the quality of learning for our students and provide industry with a resource of skilled graduates. Through mutually beneficial forms of engagement, we support the lifelong learning needs of our alumni. We promote economic and social development in communities that include Boston and beyond.

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:

- Written, oral, and visual communication
- Problem solving
- Information literacy skills
- Applications of ethics to decision-making
- Logical thinking and scientific and quantitative reasoning
- 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, most baccalaureate students have the opportunity to participate in Wentworth's optional pre-cooperative education semester prior to entering their junior year. The cooperative education model, in which students complete two work semesters along with their academic degree requirements, is both a university tradition

and a graduation requirement. (see individual program listings for details about coop semester schedules).

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 20 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 seniors 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-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 for Master of Architecture and Applied Computer Science are offered in one, two, or three-year length of study dependent upon type of baccalaureate degree earned. All other graduate degree programs are offered in a full-time, one year accelerated length of study or in a part-time less than two-year length of study. 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.

Wentworth Institute of Technology offers bachelor's degrees in the following disciplines:

School of Architecture and Design

- Architecture (BSA)
- Industrial Design (BIND)
- Interior Design (BINT)

School of Management

- Business Management (BSM)
- Computer Information Systems (BSIS)
- Construction Management (BSCM)
- Project Management (BPM)

School of Computing and Data Science

- Computer Networking (BSCN)
- Computer Science (BCOS)
- Cybersecurity (BSCY)
- Information Technology (BSIT)
- Applied Mathematics (BSAM)

School of Engineering

- Biological Engineering (BSBE)
- Biomedical Engineering (BBME)
- Civil Engineering (BSCE)
- Computer Engineering (BSCO)
- Electrical Engineering (BSEE)
- Electromechanical Engineering (BELM)

- Engineering (BSEN)
- Mechanical Engineering (BSME)

School of Sciences and Humanities

- Applied Science (BSAS)
- Computer Science and Society (BCTS)

Minors

- Actuarial Science
- Aerospace Engineering
- American Studies
- Applied Math
- Biology
- Business Analytics
- Business Management
- Chemistry
- Civil Engineering
- Computer Networking
- Computer Science
- Construction Management
- Construction Manufacturing
- Cybersecurity Management
- Data Science
- Electrical Engineering
- Environmental Engineering
- Information Security Awareness
- Internet of Things
- Manufacturing
- Media, Culture, and Communication Studies
- Performing Arts (through COF)
- Physics
- Science, Technology and Society
- Sustainability (through COF)

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)
- Business Analytics (MBSA)
- Civil Engineering (MSCV)
- Computer Engineering (MSCE)
- Construction Management (MSCM)
- Data Analytics (MSDS)
- Electrical Engineering (MSEE)
- Facility Management (MSFM)
- Project Management (MSPM)

Accreditation

Wentworth Institute of Technology is accredited by the New England Commission of Higher Education. 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 301 Edgewater Place, Suite 210, Wakefield, MA 01880 (781) 425 7785 E-Mail: info@neche.org Wentworth is also a member of the American Society for Engineering Education (ASEE), the Association of Collegiate Schools of Architecture, the Boston Chapter of the International Facility Management Association (IFMA), and the National Commission for Cooperative Education.

School of Management

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

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

[Construction Management Accreditation Letter](https://wit.edu/sites/default/files/2021-05/acce-construction-accred.pdf) (<https://wit.edu/sites/default/files/2021-05/acce-construction-accred.pdf>)

School of Architecture and Design

The Master of Architecture degree program is accredited by the National Architectural Accrediting Board (NAAB).

For more information on the accreditation of Wentworth's Architectural programs,

[please visit Architecture Accreditation](https://wit.edu/learning/accreditation/architecture/) (<https://wit.edu/learning/accreditation/architecture/>) (<https://wit.edu/learning/accreditation/architecture/>) (<https://wit.edu/learning/accreditation/architecture/>)

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

Accreditation. For more information on the accreditation of Wentworth's Interior Design program

[please visit Interior Design Accreditation](https://wit.edu/learning/accreditation/interior-design/) (<https://wit.edu/learning/accreditation/interior-design/>) (<https://wit.edu/learning/accreditation/interior-design/>)

The Bachelor of Science degree program in Industrial Design (BIND) is accredited by the National Association

of Schools of Art and Design (NASAD).

The School of Computing and Data Science

The Bachelor of Science degree programs in Computer Science (BCOS) and Computer Networking (BSCN)

are accredited by the Computing Accreditation Commission of ABET (<http://www.abet.org/>) (<http://www.abet.org/>) ([www.abet.org.](http://www.abet.org/))

For more information on the accreditation of Wentworth's Computer Science and Computer Networking programs

[please visit https://wit.edu/accreditation/abet-accreditation/computer-science-accreditation-information](https://wit.edu/accreditation/abet-accreditation/computer-science-accreditation-information) (<https://wit.edu/accreditation/abet-accreditation/computer-science-accreditation-information/>) and

<https://wit.edu/accreditation/abet-accreditation/computer-networking-accreditation-information> (<https://wit.edu/accreditation/abet-accreditation/computer-networking-accreditation-information/>).

Contact Computing Accreditation Commission of ABET at 415 North Charles Street, Baltimore MD 20201

or at (410) 347-7700.

School of Engineering

Wentworth's programs in Biological Engineering (BSBE), Biomedical Engineering (BBME) Civil Engineering (BSCE),

Computer Engineering (BSCO), Electrical Engineering (BSEE), Electromechanical Engineering (BELM), Engineering (BSEN),

and Mechanical Engineering (BSME) are all accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org/>) (<http://www.abet.org/>) (www.abet.org) (<http://www.abet.org/>).

For more information on the accreditation of Wentworth's engineering degree programs please visit

[ABET Accreditation](https://wit.edu/accreditation/abet-accreditation/) (<https://wit.edu/accreditation/abet-accreditation/>) (<https://wit.edu/accreditation/abet-accreditation/>) (<https://wit.edu/accreditation/abet-accreditation/>) (<https://wit.edu/accreditation/abet-accreditation/>)

Contact the Engineering Accreditation Commission, or the Engineering Technology Accreditation Commission of ABET at

415 North Charles Street, Baltimore MD. 20301 or at (410) 347-7700.

Admissions

Admissions - Undergraduate Programs

Wentworth is a member of the Common Application, and the Common Application is the exclusive method by which first year candidates apply to Wentworth. All first year candidates must complete their application no later than February 1 for consideration.

Application deadlines*:

- Early Action I - November 1
- Early Action II - January 1
- Regular Decision - February 1

*Dates are subject to change.

Transfer students will be considered for fall and spring semester admissions depending on space availability. The priority deadline for spring admissions is November 15. The priority deadline for fall admissions is June 15. The tuition and housing deposits are not refundable.

Wentworth accepts full-time students in the program majors, either as first-year or transfer applicants.

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 enrollment deadline for is May 1 to guarantee enrollment with a \$500 deposit. Deposits may be accepted after May 1 if space is available. Enrollment 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. Transfer credit that was completed more than 5 years prior to the first semester enrolled in a degree seeking program will not be accepted; this includes AP/IB credit.

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 to one of the decision rounds indicated above.

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>) or through the Common Application (<http://www.commonapp.org>).
- A \$50.00 application processing fee, due at the time the application is received.
- An official high school transcript or G.E.D. scores.
- Optional Letter of Recommendation
- A personal statement (essay) of 250-500 words.

Wentworth is SAT/ACT test optional for applicants with the exception of home-schooled applicants and applicants attending a high school that employs a narrative assessment of course performance and does not provide grades on a 4.0 scale.

First time incoming students may be required to submit an English Writing Sample during new student orientation. 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.

The Wentworth Mathematics Placement is required for all new undergraduate students, including transfer students, prior to orientation or attending classes. The goal of the mathematics placement process is to determine the appropriate level mathematics course for student success. Transfer students may be exempt from mathematics placement testing only if WIT has awarded transfer credit for degree-specific, first-level mathematics courses.

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 June 15. After this date applications are reviewed on a space available basis. 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 November 15.

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

- A transfer report (https://catalog.wit.edu/about-wentworth/admissions/undergraduate/transfer-report_0_0.pdf) from the most recent college attended. This form (https://catalog.wit.edu/about-wentworth/admissions/undergraduate/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. Credit that was completed more than 5 years prior to the first semester enrolled in a degree seeking program is not eligible for transfer.
- 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 who intend 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 but not satisfy program requirements. Credit that was completed more than 5 years prior to the first semester enrolled in a degree seeking program is not eligible for transfer, this includes AP/IB test scores.

No academic credit is awarded for Internships/COOP's, Practicum, Directed Research, Preparatory, Workforce Training, Professional Development, Continuing Education 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

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.

Advanced Placement (AP)

AP Exam Title	Score	Credits	WIT Equivalent Course
Art History Exam	3, 4, 5	4	HUMN3797 - AP Art History
Biology Exam	4, 5	4	BIOL1100 - AP Cell and Molecular Biology
Calculus AB	4, 5	4	MATH1750 - AP Engineering Calculus I or MATH1775 AP Applied Engineering Calculus I or MATH1776 Active Calculus 1A & MATH1777 Active Calculus 1B
Calculus AB (Construction Management majors only) ¹	4, 5	8	MATH1000 - AP College Mathematics & MATH1500 - AP Precalculus

AP Exam Title	Score	Credits	WIT Equivalent Course	AP Exam Title	Score	Credits	WIT Equivalent Course
Calculus AB (Computer Information System majors only)	4, 5	4	MATH1000 - AP College Mathematics	Latin	3, 4, 5	4	GNEL3797 - AP Latin Language
Calculus AB (Interior and Industrial Design Majors only)	4, 5	4	MATH1000 - AP College Mathematics	Macroeconomics	3, 4, 5	4	ECON4152 - AP Macroeconomics
Calculus AB (Business Management majors only)	3, 4, 5	4	MATH1040 - AP Applied Math for Business	Microeconomics	3, 4, 5	4	ECON4154 - AP Microeconomics
Calculus AB (Computer Networking majors only)	4, 5	4	MATH1500 - AP Precalculus	Music Theory	3, 4, 5	4	HUMN3797 - AP Music Theory
Calculus BC	4, 5	8	MATH1750 - AP Engineering Calculus I & MATH1850 AP Engineering Calculus II or MATH1876 Active Calculus & MATH1877 Active Calculus 2B	Physics 1, Algebra Based	3, 4, 5	4	PHYS1000 - AP College Physics I
Calculus BC (Architecture and Construction Management majors only) ²	4, 5	8	MATH1000 - AP College Mathematics & MATH1500 AP Precalculus	Physics C, Electricity & Magnetism	4, 5	4	PHYS1750 - AP Engineering Physics II
Calculus BC (Computer Information System majors only)	4, 5	4	MATH1000 - AP College Mathematics	Physics C, Mechanics	4, 5	4	PHYS1250 - AP Engineering Physics I
Calculus BC (Interior and Industrial Design Majors only)	4, 5	4	MATH1000 - AP College Mathematics	Psychology	3, 4, 5	4	PSYC4100 - AP Introduction to Psychology
Calculus BC (Business Management majors only)	4, 5	4	MATH1040 - AP Applied Math for Business	Spanish Language and Culture	3, 4, 5	4	GNEL3797 - AP Spanish Language and Culture
Calculus AB (Computer Information System majors only)	4, 5	4	MATH1000 - AP College Mathematics	Spanish Literature and Culture	3, 4, 5	4	GNEL3797 - AP Spanish Literature and Culture
Chemistry Exam	4, 5	4	CHEM1100 - AP General Chemistry I	Statistics	3, 4, 5	4	MATH1030 - AP Statistics and Applications
Chinese Language and Culture Exam	3, 4, 5	4	GNEL3797 - AP Chinese Language and Culture	Studio Art, 2-D Design	3, 4, 5	4	GNEL3797 - AP Studio Art: 2-D Design
Comp Government and Politics	3, 4, 5	4	POLS3797 - AP Comp Gov't & Politics	Studio Art, 3-D Design	3, 4, 5	4	GNEL3797 - AP Studio Art: 3-D Design
Computer Science A	4, 5	4	COMP1000 - AP Computer Science I	Studio Art: Drawing	3, 4, 5	4	GNEL3797 - AP Studio Art: Drawing
English Language and Comp	3, 4, 5	4	ENGL1100 - AP English I	United States History	3, 4, 5	4	HIST3797 - AP US History
English Literature and Comp	3, 4, 5	8	ENGL1100 - AP English I & LTR3797 - AP English Literature	US Government and Politics	3, 4, 5	4	POLS4102 - AP American Government
Environmental Science	3, 4, 5	4	SCIX3797 - AP Science Elective	World History	3, 4, 5	4	HIST3797 - AP World History
European History	3, 4, 5	4	HIST3797 - AP European History	**AP Credit that was completed more than 5 years prior to first semester enrolled in a degree seeking program will not be accepted for credit.			
French Language and Culture	3, 4, 5	4	GNEL3797 - AP French Language and Culture	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.			
German Language and Culture	3, 4, 5	4	GNEL3797 - AP German Language and Culture	<ul style="list-style-type: none"> Mathematics Standard Level: MATH1750 ENGINEERING CALCULUS I or MATH1776 ACTIVE CALCULUS 1A and MATH1777 ACTIVE CALCULUS 1B (2 credits) Physics: PHYS1000 COLLEGE PHYSICS I IB Humanity/Social Science courses will be considered equivalent if the incoming student places into ENGL1100 ENGLISH I 			
Human Geography Exam	3, 4, 5	4	SOCL3797 - AP Human Geography	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.			
Italian Language and Culture Exam	3, 4, 5	4	GNEL3797 - AP Italian Language and Culture				
Japanese Language and Culture	3, 4, 5	4	GNEL3797 - AP Japanese Language and Culture				

**IB Credit that was completed more than 5 years prior to first semester enrolled in a degree seeking program will not be accepted for credit.

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 (before July 2018) or a minimum scale score of 410 for IED, 410 for POE, 420 for CEA, 430 for AE, 440 for ES, or 380 for CSA.

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

PLTW Course	WIT Major (Abbreviation)	WIT Equivalency	Credits
Computer Science A	Computer Science (BCOS)	COMP1000	4
Computer Science A	Electromechanical Engineering (BELM)	COMP1000 or Technical Elective	4
Computer Science A	Engineering (BSEN)	COMP1000 or Minor Requirement	4
Introduction to Engineering Design	Biological Engineering (BSBE)	ENGR1100 & ENGR1201	4
Introduction to Engineering Design	Engineering (BSEN)	ENGR1100 & ENGR1206	4
Introduction to Engineering Design	Electromechanical Engineering (BELM)	ENGR1100 & ENGR1205	4
Principles of Engineering	Biological Engineering (BSBE)	ENGR1100 & ENGR1201	4
Principles of Engineering	Biomedical Engineering (BBME)	ENGR1100 & ENGR1202	4
Principles of Engineering	Civil Engineering (BSCE)	ENGR1100 & ENGR1203	4
Principles of Engineering	Computer Engineering (BSCO)	ENGR1100 & ENGR1204	4
Principles of Engineering	Electrical Engineering (BSEE)	ENGR1100 & ENGR1204	4
Principles of Engineering	Electromechanical Engineering (BELM)	ENGR1100 & ENGR1205	4
Principles of Engineering	Engineering (BSEN)	ENGR1100 & ENGR1207	4
Principles of Engineering	Mechanical Engineering (BSME)	ENGR1100 & ENGR1207	4
Aerospace	Electromechanical Engineering (BELM)	Technical or General Elective	4
Aerospace	Engineering (BSEN)	Minor Course	4
Civil Engineering and Architecture	Electromechanical Engineering (BELM)	General Elective	4
Civil Engineering and Architecture	Engineering (BSEN)	Minor Course	4
Environmental Sustainability	Electromechanical Engineering (BELM)	ENGR1100 & ENGR1205	4
Environmental Sustainability	Engineering (BSEN)	ENGR1100 & ENGR1206	4
Environmental Sustainability	Biological Engineering (BSBE)	ENGR1100 & ENGR1201	4

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 (registrar@wit.edu) - PLTW Transfer Credit
550 Huntington Avenue
Boston, MA 02115

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. 55). (p. 55)

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>) or through the Common Application website (<http://www.commonapp.org>).
- 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 transcript evaluation from one of the following companies:
 - Center for Educational Documentation (CED)
 - World Education Services, Inc. (WES)
- Evidence of proficiency in English if the applicant's first language is not English. Acceptable evidence of proficiency includes:
 - A Duolingo English Test (DET) minimum score of 105.
 - A Test of English as a Foreign Language (ETS TOEFL) score of 79 or higher on the internet-based exam with no subsection lower than 17. Wentworth's school code is 3958.
 - An International English Testing System (IELTS Academics) 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.
 - A College Board SAT evidence based reading and writing minimum score 525. Wentworth's school code is 3958.
 - An ACT minimum reading score of 18 and English score of 20. Wentworth's school code is 1928.
 - 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.
 - A PTE minimum English academic score of 53.
 - Proof of students who has been taking college-preparatory English classes an English language-based high school, and obtain a grade of 'C' or higher (ex: a US high school, an American high school abroad, etc.).

- 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.

Students whose secondary education took place in one of the English-speaking countries are exempt from the English proficiency requirement. A list of recognized programs is available from the admissions office. Students born in one of these countries, yet educated elsewhere for secondary education, are required to satisfy the English proficiency requirement.

- Original signed letter of support from a recognized sponsoring embassy, agency, or organization, if applicable.
- Recommendations from a teacher (preferably math or science) and a guidance counselor.
- Optional recommendation letter
- College Official's Report (transfer students) from the most recent college attended. This form (<https://wit.edu/sites/default/files/2020-11/Transfer%20Report.pdf>) must be completed by a school official who is knowledgeable of your academic and disciplinary standing.

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 made available in the application portal to the student.

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.

Once accepted, a tuition deposit of \$500.00 is required to guarantee enrollment. The deposit deadline is August 1. Deposits will be accepted after August 1 for the Fall semester on a space-available basis. Payments may be made by Flywire (<http://www.flywire.com/pay/wit/>), or by credit card, check, or Cashnet. These deposits are non-refundable for the fall semester. For the spring semester admission, the deposits are non-refundable and due by December 15.

Once the deposit(s) is made the following documents are required so that a Certificate of Eligibility (Form I-20) can be issued for visa purposes:

- 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 more information on Proof of Financial Support visit <https://wit.edu/admissions/undergraduate/international> (<https://catalog.wit.edu/about-wentworth/admissions/undergraduate>). For more information on Proof of Financial Support visit <https://wit.edu/>

admissions/undergraduate/international/). Proof of support must be provided on the Wentworth Declaration and Certification of Finances form, signed by the student's sponsor, with an attached certified bank letter from the sponsor's bank.

- A copy of the identity page from the applicant's passport.

All remaining charges and monies due to Wentworth must be paid by one of the following methods:

- A bank draft in United States dollars drawn on a correspondent bank with offices in the United States. Checks must be in U.S. dollars and payable in the United States.
- Credit card
- Flywire (<http://www.flywire.com/pay/wit/>)

It should be noted that payment for each semester's tuition, room, and board charges must be paid by the due date, as failure to pay may lead to the cancellation of classes and/or housing.

All first-time 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 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. 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.

The Wentworth Mathematics Placement is required for all new undergraduate students, including transfer students, prior to orientation or attending classes. The goal of the mathematics placement process is to determine the appropriate level mathematics course for student success. Transfer students may be exempt from mathematics placement testing only if WIT has awarded transfer credit for degree-specific, first-level mathematics courses.

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 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 on-campus and 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) (p. 71)

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

- Civil Engineering (MECE) (p. 100)

Master of Science (M.S.)

- Applied Computer Science (MSACS) (p. 90)
- Business Analytics (MSBA)
- Civil Engineering (MSCV) (p. 101)
- Computer Engineering (MSCE) (p. 106)
- Construction Management (MSCM) (p. 128)
- Data Science (MSDA) (p. 92)
- Electrical Engineering (MSEE) (p. 107)
- Facility Management (MSFM) (p. 130)
- Project Management (MSPM) (p. 136)

Application Requirements

Candidates must complete the online application (<http://wit.edu/apply/>) and submit the following materials:

- **Statement of Purpose/Objectives:** 500-1000 words (see application for program specific prompts)
- **Resume or Curriculum Vitae (CV)**
- **Recommendation Letters:** With your application, you should submit the names and titles and contact information from people willing to submit a reference for you. Most programs require one letter of recommendation. Architecture requires two 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. (The Graduate Admissions Office will obtain transcripts of internal candidates from Wentworth on their behalf)
- **Application Fee:** A non-refundable \$50 fee is required.
- **Design Portfolio (M.Arch Only):** Portfolios are required for applicants to all three M.Arch program tracks. Portfolios should include work that demonstrates your proficiency in architecture and/or other visual media; they should reflect the full range of your creative, research, and technical skills. The portfolio should be submitted as an electronic PDF file. Additional guidance is provided in 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:

Graduate Admissions

Wentworth Institute of Technology

550 Huntington Ave
Boston, MA 02115

Admissions Decisions

Completed applications are reviewed by the academic unit. Applications are accepted for the fall and spring semesters and are reviewed on a rolling basis. 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. Deposits of \$250 are required to accept your offer of admittance and are non-refundable.

The recommended undergraduate GPA is 3.0. The admissions committee may request other material if the GPA is below a 3.0.

Portfolio Recommendations (M.Arch)

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

- **Format:** Applicants should submit an electronic copy of their portfolio, saved as a PDF. Portfolios may be uploaded to the application. Portfolios should be designed for viewing one page at a time (not as a two-page spread) using landscape orientation and standard aspect ratios such as 4:3 and 16:9.
- **Content:** Please show a range of your original design work, including design drawings, sketches, model images, photography, sculpture, writing samples – any work that conveys your artistic sensibilities. Emphasize four to five of your best projects. Non-academic creative and professional work may be included if it demonstrates your abilities to perform successfully as a graduate student.
- **Organization:** Portfolios should be well organized with a brief introductory text for each project. Each project should be clearly labeled. Indicate whether the project was completed as part of a course by including the name of the professor, studio, and semester. In the case of team projects, you must identify your role on the team and specify authorship of drawings, images, and artifacts seen in the portfolio
- **Professional Quality:** 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 layouts of imagery and brief, informative texts using straightforward typefaces scaled for ease of reading on a laptop. Make an effort to document your work carefully so that all images of your work are of high resolution and large enough to understand in detail; the committee expects a professional presentation.

ACADEMIC POLICIES & PROCEDURES

Graduate Policies and 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 associate dean (or 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 associate dean 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 decides to appeal the faculty member's decision, a student should contact the associate dean of the school offering the course in writing, within five business days from the date of the grievance. If the matter is related to Co-op, the student must contact, in writing, the Director of Cooperative Education and Career Development. The school associate dean 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 associate dean** (or Director of Cooperative Education and Career Development for co-op cases). The student may seek a review by the associate dean (or Director of Cooperative Education and Career Development for co-op cases). The student submits the communication about the issue with the faculty member, any supporting evidence, and the decision of the faculty member to the associate dean of the offering course (or Director of Cooperative Education and Career Development for co-op cases). The associate dean (or Director of Cooperative Education and Career Development

for co-op cases) will meet or speak with the student, the faculty member, and any other persons he/she deems necessary. The associate dean (or Director of Cooperative Education and Career Development for co-op cases) 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 associate dean (or Director of Cooperative Education and Career Development for co-op cases), the student may seek review, in writing, within five business days of receipt of the associate dean's (or Director of Cooperative Education and Career Development for co-op cases) 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 associate dean (or Director of Cooperative Education and Career Development for co-op cases) to the Executive Assistant to the Provost.

Academic Review Committee Process

The Academic Review Committee members are the deans of the schools, 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 associate dean and may ask faculty, 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, University suspension, or University 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 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 Credit Exam

Matriculating Graduate students who seek to obtain credit for knowledge in a field essential to their program of study but acquired by means that preclude formal transfer credit and can demonstrate evidence of expertise are eligible to apply for an Advanced Credit Examination as determined by the academic unit. Students who have been awarded eight (8) transfer credit hours are not eligible for Advanced Credit Examinations. Students who petition for an Advanced Credit examination must request permission prior to the start of the semester in which they are enrolled. Advanced Credits Examinations will be administered prior to the start of the semester in which the student is enrolled. Grading for Advanced Credit Examinations is pass only. Exams are graded before the end of the drop/add period. Successful completion of an Advanced Credit 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. Advanced Credit Examinations are not repeatable.

Alternative to Classroom Study Options

Independent Study

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

Graduate Co-op

Graduate Co-op is required for students enrolled in the 2-year and 3-year M.Arch degree programs. Students should refer to their specific program requirements to determine their Co-op semester.

- COOP6500: GRADUATE COOP EDUCATION required for 2 and 3 year M.ARCH students only is considered full-time enrollment status. For all other graduate programs, COOP6500 is considered an optional COOP. Students in this instance will not be considered as full time graduate students and should contact their Financial Aid Advisor for information on how this status change will impact their semester.

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 Director of Military Connected Services (military@wit.edu) 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

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 their 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 they 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 them availing themselves 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.

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 seek 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.

Change or Declare Programs

Change of Program

Students seeking to change to a new graduate program at the same level should consult with the associate dean of the school for the graduate

program of the new program they are considering. The associate dean or designee will interview the student and review the academic record, and, in some cases, a full review of academic credentials may be necessary. If the request is approved, a Change of Program form (<https://wit.edu/ssc/forms/>) is completed, the signature of associate dean of the graduate program and the student are required for the change to become official. Change of programs for a current semester must be received and processed by the Registrar (registrar@wit.edu) 15 days prior to the start of a semester, otherwise all change of programs will become effective at the start of the next semester the student is enrolled.

It is important to note that not all change of program requests are granted by the associate dean of the school for the graduate program if upon review of the students' academic credentials a student has not met the requirements for acceptance into the new program.

Students considering a change of program 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 program.

Adding a Second Graduate Degree

Matriculating graduate students pursuing two graduate degrees must complete at least an additional 24 credit hours in residence. Because the program requirements for each program must be met, it is possible that more than 24 semester credit hours will be needed to fulfill these requirements. In such cases, a second graduate degree is recorded on the student's transcript and dated; accordingly, Wentworth does not allow concurrent dual graduate degrees.

Returning students pursuing an additional graduate degree from Wentworth Institute of Technology must have completed all requirements for the first graduate degree and be formally approved to return in pursuit of second graduate degree. Students will be held to the catalog year in which the second graduate degree is initiated and will complete at least 24 additional credits in residence. Coursework completed in the first graduate degree cannot be applied to the minimum of 24 credits in residence requirement f. Upon completion of all required coursework, the second graduate degree will be recorded on the students' transcript and dated accordingly. Students seeking a second graduate degree are advised to consult with Student Financial Services and Financial Aid.

Counting Credits Towards Multiple Degree and/or Programs

Wentworth Institute of Technology limits the counting of credits toward multiple degree and/or programs to protect the academic integrity of each degree and/or program. When a student is counting credits towards multiple degrees and/or programs in the same or closely related fields and the coursework makes up an integral part of the degree and/or programs, the following restrictions apply:

- The student must be admitted to the degree program in each of the awarding academic units/schools.
- In no instance shall course credit be counted more than twice in satisfaction of the requirements for multiple degree and/or programs.
- In order to earn two or more degrees and/or programs students must earn a minimum of 80% of the combined total of the credits normally required for each of the degrees.

Exceptions: Two 30 credit graduate degrees will not be awarded for fewer than 51 credits (i.e. up to 9 credits can be shared between the two graduate degrees)

Changes to Enrollment Status

Withdrawals

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

Withdrawal within the Semester-Graduate

Students who decide to withdraw from Wentworth are required to submit a Voluntary Withdrawal Form (<http://www.wit.edu/ssc/forms/>) to the Registrar at registrar@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 choose 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 Registrar (registrar@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, which may be extended for up to one year at the request of the student. Students who are interested in a medical leave of absence should contact the Dean of Students Office. Students must complete the required medical leave of absence petition. 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 Dean of Students Office.

Voluntary 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 graduate advisor or associate dean at least 15 days 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 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 the associate dean of their program of study 15 days prior to the start of the semester they intend to return. Students who are not registered for classes prior to the first day of classes will revert to a status of withdrawn.

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 the University 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 Registrar (registrar@wit.edu); students who skip a semester(s) may be considered for reinstatement; all requests require the approval of their school dean or designee. Students must initiate their reinstatement 15 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 the next 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.

Withdrawal for Military Connected Services

Students who are members of the United States Armed Forces who are called to active duty while enrolled at Wentworth are entitled to the following two options:

- Students may work with each individual professor to determine if they can receive an incomplete grade; the student must ensure that they will be able to adhere to the incomplete grade policy or
- an incomplete grade is not an option or desired, the student will be permitted to withdraw either from individual courses or from the entire schedule of classes and the letter grade of W is recorded on their transcript.

Students who are called to active duty while enrolled should contact the Office of Military-Connected Services (OMCS) military@wit.edu to discuss their options and initiate the withdrawal process. An official copy of the military orders must be presented to the OMCS to use this withdrawal process. If official orders are not readily available an official memorandum or similar documentation from the student's military leadership will be accepted. OMCS staff will assist the student in determining proper documentation. If Withdrawal(s) is chosen, the effective date of withdrawal will also serve as the effective date for any related Wentworth policies and services. This policy does not include regularly scheduled drill weekends and annual training for National Guard and Reserve members.

Reinstatements

All graduate students seeking reinstatement from a Leave of Absence or Withdrawal must initiate this process 15 days prior to the start of the semester they intend to enroll. The condition of the separation will determine the process a student follows.

Withdrawal

A student who has not been enrolled in their graduate program for more than one academic year must file an application for reinstatement.

The student's graduate program will determine in each case whether a student should be reinstated. If the program's requirements have changed during the student's absence or the student is not deemed current in their field of study, the program may require the student to repeat or supplement previous academic requirements. When the student is reinstated, the student will be informed of current status regarding credits and time to degree.

Leave of Absence after One Semester

Students who intend 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 dean or associate dean of their degree program at least 15 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 Registrar (registrar@wit.edu) (registrar@wit.edu) 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. To begin the process to return to classes from a medical leave of absence, students should contact the Dean of Students Office.

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 dean or associate dean of their degree program and notify the Office of Military Connected Services at military@wit.edu.

Communication with Students

The Wentworth Institute of Technology e-mail account is the official means of communication with Wentworth students. All WIT graduate students are required to activate their WIT email accounts. Students who prefer to use an email service other than the WIT email as their primary account, must arrange for messages sent to the official address to be forwarded to the preferred email address. All academic offices and other WIT administrative offices use the WIT email account as a means of conveying important information to students. It is the responsibility of each student to be aware of the information sent by email.

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

logins utilize Microsoft Active Directory to authenticate the user. The password 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://catalog.wit.edu/academic-policies-procedures/gr/distance-students/Online_Programs_Complaint_Processes_02_2021.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 (<https://www.mass.edu/forstufam/documents/Final%20DHE%20Complaint%20Policy.pdf>) document.

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.

To remain in Good Academic Standing all graduate students must maintain a minimum GPA of 3.0.

Notification to Students

All graduate students who fail to meet the minimum 3.0 GPA requirement for Graduate Good Academic Standing at the end of each semester will be placed on Academic Probation and notified via their Wentworth e-mail address within one week after final grades are posted to their academic transcript. Student's placed on Academic Dismissal are notified within one week after final grades and are given the option to appeal their Academic Dismissal.

Academic Probation

Students whose cumulative GPA falls below a 3.0 (consecutive or non-consecutive semester) will be placed on Academic Probation and counseled by their respective graduate advisor of their program concerning continuation in the graduate program. Students placed on Academic Probation must raise their cumulative GPA to 3.0 by the end of the next semester or for part-time students after the completion of 9 additional credits.

Academic Dismissal

Students whose cumulative GPA falls below 3.0 for two semesters; failure to make satisfactory progress toward completion of degree; or failure to meet the conditions of probation are academically dismissed. Students may appeal this decision by submitting a letter of appeal to the Academic Appeals Committee in care of the assistant to the provost, per the guidelines outlined in the letter of dismissal. If the appeal is granted the conditions for continuing in the graduate program will be determined by the academic unit of the students degree program. Students whose appeal was denied or for students who did not appeal their academic dismissal will be dropped from all semester registrations and may apply for readmission after 1 year to the dean or associate dean of the school upon demonstration of adequate reason for readmission.

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 occur when a student repeats a grade of "F". *Exclusions for Special Topics courses applies when repeating a special topics course with the same course title.*

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 graduate 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: Graduate

Grade	Weight	Numerical Definition	Definition
A	4	93-100	Distinction
A-	3.67	90-92	High Pass
B+	3.33	87-89	Pass
B	3.00	83-86	Pass
B-	2.67	80-82	Provisional
C+	2.33	77-79	Provisional
C	2.00	73-76	Provisional
F	0	0-72	No Pass
P	0		Pass (for credit)
S	0		Satisfactory (no credit)
U	0		Unsatisfactory (no credit)
W	0		Withdrew
IC	0		Incomplete (temporary)
NR	0		Grade Not Reported by Instructor

Wentworth does not offer students the option to audit a course; if a student is granted an exception to this policy the course cannot be converted at any time to a credit bearing course and will not satisfy a degree requirement.

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. If course instructor cannot be reached or is no longer at Wentworth, the student should contact the associate dean offering the course.

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 a 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

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 "C" or higher may not be retaken for improving the overall program GPA.

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.

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 MyWentworth 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 associate deans 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.

Graduate Degrees

Degrees Awarded

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

- Master of Architecture
- Master of Science
- Master of Engineering

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 Registrar at registrar@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

Students must complete all requirements for their graduate degree within seven (7) years from the time of enrollment. If a student does not meet this requirement the student may petition the associate dean of the school for the graduate program for reinstatement of credits completed that were outside the seven (7) year time frame.

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 the associate dean of the school for the graduate program 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.

Graduation

Degree Application

Students who believe they are ready to receive their degree from Wentworth Institute of Technology and have a grade point average of 3.0 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 3.0. 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.

Graduation Criteria

Curriculum leading to graduate degree are so planned that a student will ordinarily be able to complete the requirements for graduation in one (1) year for accelerated graduate programs (M.Arch, MSACS, MSCM, MSDS, MSEE, MSCE, MSCV and M.Eng.CE) or in less than two (2) years MSCM, MSDA, MSPM & M.Eng.CE. Degrees will be awarded to candidates who have fulfilled the following:

- Satisfactory completion of all requirements for a graduate degree must be under a catalog in effect within two years of the date of graduation. The catalog used, however, may be no earlier than the catalog in effect at the time of matriculation or in the case of a change of program no earlier than the catalog in effect when the program was formally changed.
- A maximum of eight (8) transfer credit hours may be applied towards the completion of a graduate degree; the remaining credit hours must be completed at Wentworth Institute of Technology.
- A minimum cumulative GPA of 3.0 or higher and any other academic requirements of the students major as outlined by the academic unit.
- Students will not be allowed to receive their diplomas or transcripts until all financial obligations to the University have been resolved.

- Conferral of a graduate degree occurs when the registrar finalizes the student's academic record and confirms that all requirements have been satisfied, which includes 'IC' (Incomplete) grades.
- 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.

Graduate Degree Distinction

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
- 3.0 or higher, cumulative grade point average in the semester before graduation

Registration

Registration - New and Returning Students

- **Preregistration** for current undergraduate students conditionally accepted into a graduate program for the fall semester is held in June.
- **Registration for newly accepted graduate students** occurs in June prior to the student's matriculation in the fall semester.
- **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. Students must resolve all holds on their accounts prior to the start of the registration period.

Registration Hold Due to Non-Payment

Approved methods to settle the bill:

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

Course Load

- 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 the Associate Dean of their program on a Credit Overload Form (<https://wit.edu/ssc/forms/>). An overload is any number of semester credit hours beyond the number that appears on their graduate degree plan. A student will be assessed a per-credit tuition charge for each approved overload credit 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 a Graduate Course Withdrawal form (<https://wit.edu/ssc/forms/>), and submit it to the Registrar registrar@wit.edu no later than the deadline published in the Academic Calendar. 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 9 credit hours may impact a student's financial aid package, housing, and may extend a student's graduation date. International students who choose to withdraw from a course are required to obtain the written permission of the Director of International Student Services ; International students must be full-time to maintain valid F-1 Student Visa status.

Transfer Credit after Matriculation

To receive credit for courses taken at another accredited institution, graduate 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 (<https://wit.edu/ssc/forms/>). Requests for approval of a course from another institution should be accompanied by the course description and the syllabus from that institutions catalog. Approval must be obtained prior to registering for the course at the other institution, failure to adhere to the pre-approval guidelines may result in denial of transfer academic credit. It is the students' responsibility to have official transcripts sent directly by the institution to the Registrar's Office upon completion of the course.

Note: a minimum grade of "B" 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".

- **New Graduate Transfer students** must submit an official transcript to the Office of Graduate Admissions before the University can evaluate and award credit. Students who have attended regionally accredited institutions may receive a maximum of 2 courses or 8 credits completed with a final grade of B or higher that are comparable in depth and content to those offered at Wentworth. Under no circumstances will graduate credit be granted for undergraduate credit completed another university.

Residency Requirements

Students enrolled in a graduate degree program may apply a maximum of 8 credits towards the completion of their graduate degree, the remaining credits hours must be completed at Wentworth Institute of Technology.

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 the University reflect the student major 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.

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 WID number, if available; there is no fee for transcripts.

Wentworth Academic Credit

WIT Academic Credit Awarded for Academic Engagement

Credits Awarded	Minutes of "Academic Engagement" ¹	Clock Hour	50-minute "Hour"
1	2,250 (37.5 hours)	45	37.5
2	4,500 (75 hours)	90	75
3	6,750 (112.5 hours)	135	112.5
4	9,000 (150 hours)	180	150
5	150	225	187.5
6	13,500 (225 hours)	270	225

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 hour¹ 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.

Undergraduate Policies and 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 associate dean (or 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 associate dean 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 wanted to appeal the faculty member's decision, a student should contact the associate dean of the academic unit offering the course in writing, within five business days from the date of the grievance. If the matter is related to Co-op, the student must contact, in writing, the Director of Cooperative Education and Career Development. The associate dean 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 associate dean or (Director of Cooperative Education and Career Development for co-op cases).** The student may seek a review by the associate dean (or Director of Cooperative Education and Career Development for co-op cases). The student submits the communication about the issue with the faculty member, any supporting evidence, and the decision of the faculty member to the associate dean of the offering course (or Director of Cooperative Education and Career Development for co-op cases). The associate dean (or Director of Cooperative Education and Career Development for co-op cases) will meet or speak with the student, the faculty member, and any other persons he/she deems necessary. The associate dean (or Director of Cooperative Education and Career

Development for co-op cases) 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 associate dean (or Director of Cooperative Education and Career Development for co-op cases), the student may seek review, in writing, within five business days of receipt of the associate dean's (or Director of Cooperative Education and Career Development for co-op cases) 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 associate dean (or Director of Cooperative Education and Career Development for co-op cases) to the Executive Assistant to the Provost.

Academic Review Committee Process

The Academic Review Committee members are the deans of the school, 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 associate dean and may ask faculty, 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, University suspension, or University 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. AP credit that was completed 5 or more years prior to the first semester enrolled in a degree seeking program is not eligible for transfer.

AP Exam Title	Score	Credits	WIT Equivalent Course
Art History Exam	3, 4, 5	4	HUMN3797 - AP Art History
Biology Exam	4, 5	4	BIOL1100 - AP Cell and Molecular Biology
Calculus AB	4, 5	4	MATH1750 - AP Engineering Calculus I or MATH1775 AP Applied Engineering Calculus I or MATH1776 Active Calculus 1A & MATH1777 Active Calculus 1B
Calculus AB (Construction Management majors only)	4, 5	8	MATH1000 - AP College Mathematics & MATH1500 - AP Precalculus
Calculus AB (Computer Information System majors only)	4, 5	4	MATH1000 - AP College Mathematics
Calculus AB (Interior and Industrial Design Majors only)	4, 5	4	MATH000 - AP College Mathematics
Calculus AB (Business Management majors only)	4, 5	4	MATH1040 - AP Applied Math for Business
Calculus AB (Computer Networking majors only)	4, 5	4	MATH1500 - AP Precalculus
Calculus BC	4, 5	8	MATH1750 - AP Engineering Calculus I & MATH1850 AP Engineering Calculus II or MATH1775 & MATH1875 or MATH1776 & MATH177 and MATH1876 & MATH1877
Calculus BC (Construction Management majors only)	4, 5	8	MATH1000 - AP College Mathematics & MATH1500 AP Precalculus
Calculus BC (Computer Information System majors only)	4, 5	4	MATH1000 - AP College Mathematics
Calculus BC (Interior and Industrial Design Majors only)	4, 5	4	MATH1000 - AP College Mathematics

AP Exam Title	Score	Credits	WIT Equivalent Course
Calculus BC (Business Management majors only)	4, 5	4	MATH1040 - AP Applied Math for Business
Calculus BC (Computer Networking majors only)	4, 5	4	MATH1500 - AP Precalculus
Chemistry Exam	4, 5	4	CHEM1100 - AP Engineering Chemistry I
Chinese Language and Culture Exam	3, 4, 5	4	GNEL3797 - AP Chinese Language and Culture
Comp Government and Politics	3, 4, 5	4	POLS3797 - AP Comp Gov't & Politics
Computer Science A	4, 5	4	COMP1000 - AP Computer Science I
English Language and Comp	3, 4, 5	4	ENGL1100 - AP English I
English Literature and Comp	3, 4, 5	8	ENGL1100 - AP English I & LITR3797 - AP English Literature
Environmental Science	3, 4, 5	4	SCIX3797 - AP Science Elective
European History	3, 4, 5	4	HIST3797 - AP European History
French Language and Culture	3, 4, 5	4	GNEL3797 - AP French Language and Culture
German Language and Culture	3, 4, 5	4	GNEL3797 - German Language and Culture
Human Geography Exam	3, 4, 5	4	SOCL3797 - AP Human Geography
Italian Language and Culture Exam	3, 4, 5	4	GNEL3797 - AP Italian Language and Culture
Japanese Language and Culture	3, 4, 5	4	GNEL3797 - AP Japanese Language and Culture
Latin	3, 4, 5	3	GNEL3797 - AP Latin Language
Macroeconomics	3, 4, 5	4	ECON4152 - AP Macroeconomics
Microeconomics	3, 4, 5	4	ECON4154 - AP Microeconomics
Music Theory	3, 4, 5	4	HUMN3797 - AP Music Theory
Physics 1, Algebra Based	3, 4, 5	4	PHYS1000 - AP College Physics I
Physics C, Electricity & Magnetism	4, 5	4	PHYS1750 - AP Engineering Physics II
Physics C, Mechanics	4, 5	4	PHYS1250 - AP Engineering Physics I
Psychology	3, 4, 5	4	PSYC4100 - AP Introduction to Psychology
Spanish Language and Culture	3, 4, 5	4	GNEL3797 - AP Spanish Language and Culture
Spanish Literature and Culture	3, 4, 5	4	GNEL3797 - AP Spanish Literature and Culture
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

AP Exam Title	Score	Credits	WIT Equivalent Course
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

College Level Examination Program (CLEP)

The CLEP program applies only to students who have been out of high school for at least three years. Students must have taken the CLEP examination before matriculating at Wentworth Institute of Technology. No student will receive credit for a CLEP examination if they have received credit at Wentworth Institute of Technology or transferred credit to the University for an equivalent course.

Students may receive academic credit by completing the College Level Examination Program (CLEP). Examinations are offered in a wide variety of subjects and are tied closely to specific courses. To receive credit for CLEP exams, students need to achieve a "C" grade or better as a "Mean Scaled Score."

Interested students must contact

CLEP
Box 6600
Princeton, NJ 08541-6600
(609) 951-1026

for dates and locations of CLEP exams.

The following is a list of acceptable examinations. The student must achieve a "C" grade or better as a "Mean Scaled Score."

CLEP Exam Title	Credits	WIT Equivalent Course
American Government	4	POLS4102 - Intro to American Government
American Literature	4	LITR3797 - American Literature
Analysis & Interpretation of Literature	4	LITR3797 - Interpretation of Literature
Calculus	4	MATH1750 - Engineering Calculus I or MATH1776 Active Calculus 1A & MATH1777 Active Calculus 1B
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

CLEP Exam Title	Credits	WIT Equivalent Course
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

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 or MATH1776 ACTIVE CALCULUS 1A (2 credits) & MATH1777 ACTIVE CALCULUS 1B (2 credits)
- 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 (before July 2018) or a minimum scale score of 410 for IED, 410 for POE, 420 for CEA, 430 for AE, 440 for ES, or 380 for CSA. **waived for the 2019-2020 school year**

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

PLTW Course	WIT Major (Abbreviation)	WIT Equivalency	Credits	PLTW Course	WIT Major (Abbreviation)	WIT Equivalency	Credits
Computer Science A	Computer Science (BCOS)	COMP1000 COMPUTER SCIENCE I	4	Principles of Engineering	Electrical Engineering (BSEE)	ENGR1100 INTRODUCTION TO ENGINEERING	4
Computer Science A	Electromechanical Engineering (BELM)	COMP1000 COMPUTER SCIENCE I or Technical Elective	4			EXPERIENCE and ENGR1204 ENGINEERING LABORATORY-BSEE/BSCE	
Computer Science A	Engineering (BSEN)	COMP1000 COMPUTER SCIENCE I or Minor Requirement	4	Principles of Engineering	Electromechanical Engineering (BELM)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and EN	4
Introduction to Engineering Design	Biological Engineering (BSBE)	ENGR1300 FIRST-YEAR ENGINEERING DESIGN and ENGR14 APPLIED ENGINEERING ANALYSIS-BSBE	4	Principles of Engineering	Engineering (BSEN)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and ENGR1206 ENGINEERING LABORATORY-BSEN	4
Introduction to Engineering Design	Engineering (BSEN)	ENGR1300 FIRST-YEAR ENGINEERING DESIGN and ENGR1406 APPLIED ENGINEERING ANALYSIS-BSEN	4	Principles of Engineering	Mechanical Engineering (BSME)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and EN	4
Introduction to Engineering Design	Electromechanical Engineering (BELM)	ENGR1300 FIRST-YEAR ENGINEERING DESIGN and ENGR14 APPLIED ENGINEERING ANALYSIS-BELM	4	Aerospace	Electromechanical Engineering (BELM)	Technical or General Elective: Aerospace	4
Principles of Engineering	Biological Engineering (BSBE)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and ENGR1201 ENGINEERING LABORATORY-BSBE	4	Aerospace	Engineering (BSEN)	Minor Course: Aerospace	4
Principles of Engineering	Biomedical Engineering (BBME)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and EN ENGINEERING LABORATORY-BBME	4	Civil Engineering and Architecture	Electromechanical Engineering (BELM)	GNEL1XXX Civil Engineering and Architecture	4
Principles of Engineering	Civil Engineering (BSCE)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and ENGR1203 ENGINEERING LABORATORY-BSCE	4	Civil Engineering and Architecture	Engineering (BSEN)	Elective: Civil Engineering and Architecture	4
Principles of Engineering	Computer Engineering (BSCO)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and EN ENGINEERING LABORATORY-BSEE/BSCE	4	Environmental Sustainability	Electromechanical Engineering (BELM)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and ENGR1205 ENGINEERING LABORATORY-BELM	4
Principles of Engineering	Computer Engineering (BSCO)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and EN ENGINEERING LABORATORY-BSEE/BSCE	4	Environmental Sustainability	Engineering (BSEN)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and EN	4
Principles of Engineering	Computer Engineering (BSCO)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and EN ENGINEERING LABORATORY-BSEE/BSCE	4	Environmental Sustainability	Biological Engineering (BSBE)	ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE and ENGR1201 ENGINEERING LABORATORY-BSBE	4

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 approval of an associate dean 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 for their first required COOP and COOP4500 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: Optional Cooperative Education is offered only in the student's summer semester prior to the Junior year and does not satisfy the either of the semester COOP requirements. Enrollment in the Optional COOP3000 will impact the student's enrollment status; students are strongly urged to contact their Financial Aid Advisor for more information.
- COOP5000: Additional Cooperative Education. (Prerequisites for COOP5000 are successful completion of COOP3500 and COOP4500 and requires permission of the students' Co-Op + Career Advisor.). Enrollment in the Additional COOP5000 will impact the students enrollment status; students are strongly urged to contact their Financial Aid Advisor for more information.

Upon completion of the co-op and assignments, students earn a satisfactory/unsatisfactory (S/U) grade, which is recorded on the student's official transcript.

Occasionally students enter the baccalaureate programs with substantial work experience in their major field. With the approval of the associate dean of the school, 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.

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 Director of Military Connected Services (military@wit.edu) 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

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. Students can find more details about this program (<http://www.acenet.edu>). If such an evaluation exists, Wentworth can accept the recommended credits into a student's degree plan if it fits within the degree requirements for BSPM and undergraduate certificates CPMF, CMPC, CPPM and PLS.

Prior Learning Assessment (PLA)

Degree seeking students in BSPM are eligible to earn a maximum of 45 credits in a bachelors' degree program a for learning experiences that took place outside of the classroom, through work experience, training programs, or volunteer opportunities. Students must be admitted into the BSPM degree program and must enroll and successfully complete the PLA course 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.

The 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.

Course Section Restrictions

Courses with a 'C' designation preceding the section number (ECON3200-C71) are offered to degree seeking students enrolled in the following programs; ABCM, AENT, BBCM, BSFM, BSPM and undergraduate certificates; CPMF, CMPC, CPPM and PLS. Students enrolled in all other programs must obtain approval from the associate dean of the relevant school.

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 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. All challenge examinations must be administered and graded prior to the start of the course. 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.

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 want 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.

Change or Declare Programs

Change of Major

Undergraduate students who are in good academic standing for their class level and have the ability to obtain a degree in the desired program are eligible to submit a change of major request. For students with a GPA below #2.0, change of major may be denied if evidence of academic success is not documented on the student's academic record upon exclusion of completed courses that are not required in the new major except for Humanities and Social Science courses; the grade point average in the new major will consist of only those courses accepted in the new major. A change of major does not remove the historical academic sanctions that may have been applied under previous major. Change of Major requests must be submitted to dean or associate dean of the new major and must be received and processed by the Registrar prior to the first day of class or at least one week prior to the start of the semester registration periods for Fall, Spring and Summer, otherwise the change of major will become effective for the next semester the student is enrolled. The Change of Major to become official requires the approval signature of the dean or the associate dean. Students considering a change of major should be aware of the potential impact on time to graduate and financial standing. Students are advised to meet with their Student Accounts and Financial Aid counselors to discuss any potential impact to financial aid and tuition payments resulting from the change of major. Students changing from an associate degree program to a bachelor's degree program must submit an application to Undergraduate Admissions. International students must obtain the approval from International Student Services (ISS) for any change of major.

Add a Second Degree

Matriculating undergraduates pursuing two Bachelors 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 baccalaureate majors that require 2 required COOP semesters , 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 appropriately. Students seeking a second major are advised to consult with Student Financial Services and Financial Aid.

Add or Drop a Minor(s)

Minors offer the opportunity for students to complement their major with intensive study in another area. A minor consists of a minimum of four courses defined by an academic unit. In some cases, prerequisite courses are also required. Students in good academic standing (2.0 GPA) may declare a minor prior to the end of the drop/add period or no later than one week prior to the start of a registration period. (consult the Academic Calendar for the start dates of each registration period) by submitting a Minor Declaration form (<https://wit.edu/ssc/forms/>) to the Registrar. All declarations submitted after the drop/add period or prior to the registration period will become effective for the next semester the student is enrolled. Minors appear on the transcript only after completion of requirements has been certified and the degree has been awarded.

Change Catalog Year

Students must follow the requirements for the various degrees/majors/minors as printed in the academic catalog for the same semester that the student entered Wentworth in a degree program. Upon changing major or upon reinstatement (not enrolled for at least 2 years), a student will follow the catalog year in effect at the time the change. This does not apply to students returning from an approved Medical leave of absence or Military deployment.

Changes to Enrollment Status

Withdrawals

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

Withdrawal within the Semester

Students may choose to voluntarily withdraw from the University at any time and must submit a completed Voluntary Withdrawal Form (<http://www.wit.edu/ssc/forms/>) to the Registrar (registrar@wit.edu). 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 effective date of withdrawal will be the last date of attendance is noted on the transcript. 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 choose to complete the current semester and do not intend to return for the next semester must submit a Voluntary Withdrawal Form (<http://www.wit.edu/ssc/forms/>) to the Registrar (registrar@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, which may be extended for up to one year at the request of the student. Students who are interested in a medical leave of absence should contact the Dean of Students Office. Students must complete the required medical leave of absence petition. Petitions may not be submitted after December 1 for the fall semester, April 1 for the spring semester, and August 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 Dean of Students Office.

Voluntary Leave of Absence at the End of the Semester

A student who chooses to interrupt the usual progress of an academic program in an upcoming semester must submit a Leave of Absence (<http://www.wit.edu/ssc/forms/>) form to the Registrar (registrar@wit.edu). The student must make an appointment with their primary advisor or associate dean 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 the associate dean of their program prior to the end of the semester, to review their degree plan for the returning semester. A student returning from an approved leave of absence must submit a Request for Academic Reinstatement form (<http://www.wit.edu/ssc/forms/>) to the dean or associate dean of their major as a notification of intent to return no later than 15 days prior to the start of the semester in which they intend to return. Students returning from a leave of absence must be registered for classes prior to the first day of classes of the returning semester or will be officially withdrawn from the university.

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. Students who were administratively withdrawn by the Registrar, have no gap semester and are in Good Academic Standing must submit a Request for Academic Reinstatement form (<http://www.wit.edu/ssc/forms/>) to the Registrar (registrar@wit.edu) at least 15 business days prior to the start of the returning semester. Students in good academic standing do not require a school approval to return. Students who are administratively withdrawn and do not return to the university for their next required semester must submit a Request for Academic Reinstatement form (<http://www.wit.edu/ssc/forms/>) to dean or associate dean of their degree program at least 15 business days prior to the start of the returning semester before the request can be processed by the Registrar. Requests submitted after the 15 day period will be moved forward to the next required semester.

Withdrawal for Military Connected Services

Students who are members of the United States Armed Forces who are called to active duty while enrolled at Wentworth are entitled to the following two options:

- Students may work with each individual professor to determine if they can receive an incomplete grade; the student must ensure that they will be able to adhere to the incomplete grade policy or
- an incomplete grade is not an option or desired, the student will be permitted to withdraw either from individual courses or from the entire schedule of classes and the letter grade of W is recorded on their transcript.

Students who are called to active duty while enrolled should contact the Office of Military-Connected Services (OMCS) military@wit.edu to discuss their options and initiate the withdrawal process. An official copy of the military orders must be presented to the OMCS to use this withdrawal process. If official orders are not readily available an official memorandum or similar documentation from the student's military leadership will be accepted. OMCS staff will assist the student in determining proper documentation. If Withdrawal(s) is chosen, the effective date of withdrawal will also serve as the effective date for any related Wentworth policies and services. This policy does not include regularly scheduled drill weekends and annual training for National Guard and Reserve members.

Reinstatements

All students seeking reinstatement from a Leave of Absence, Voluntary Withdrawal or Administrative Withdrawal must initiate this process by submitting their request to the dean if their degree program at least 15 days prior to the start of the semester they plan to enroll. The 15 day advanced notice is to ensure returning students have sufficient time to meet with their dean or student success advisor to develop a plan for academic success and to contact other offices or departments that support a successful return to the university. Request for Academic Reinstatement form (<http://www.wit.edu/ssc/forms/>) submitted after the 15 day period will be moved forward to the next required semester. Reinstated students must be registered for classes prior to the start of the semester or their status will be converted to withdrawn. The condition of separation will determine the process a student follows.

Voluntary Withdrawal

Students who officially withdraw from the University and choose to reinstate must submit their request to the associate dean of their returning degree program at least 15 days prior to the start of the semester they intend to enroll prior to any action being taken. This includes course selection, registration and housing assignments. Students who choose to reinstate after two years or more must matriculate under the catalog of their reinstatement; in some cases, students may be required to complete additional coursework to become current in their discipline dependent upon industry standards. Credit for courses taken more than five (5) years prior to the student's reinstatement which include courses completed at Wentworth or transfer credit previously awarded will not be accepted. Students have the option to appeal the 5 year credit rule for courses completed at Wentworth if a final grade of B was earned. The appeal must be submitted at the same time the Request for Academic Reinstatement is submitted. All requests for reinstatement must have the approval of an associate dean and be financially cleared by Student Accounts before the Registrar processes the reinstatement.

Leave of Absence after One Semester

Students choose 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/>) the associate dean of their returning degree program at least 15 days prior to the start of the semester they intend to enroll prior to any action being taken. Students seeking reinstatement from a Leave of Absence must be registered for courses prior to the first day of classes 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 Registrar (registrar@wit.edu) 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 the University. To begin the process to return to classes from a medical leave of absence, students should contact the Dean of Students Office.

Military Deployment

At the completion of their service, students must notify the Office of Military Connected Services at military@wit.edu and submit a Request for Academic Reinstatement (<http://www.wit.edu/ssc/forms/>) form to the dean or associate dean of their degree program prior to being processed by the Registrar.

Class Requirements: English Placement

All incoming students will be placed into the appropriate English course based on the required writing sample completed 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 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
Sequence Four		

Course	Title	Credits
ENGL0700 & ENGL0800 & ENGL1100	ENGLISH AS A SECOND LANGUAGE I (COMP) and ENGLISH AS A SECOND LANGUAGE II (LIT & COMP) and ENGLISH I	12

Communication with Students

The Wentworth Institute of Technology e-mail account is the official means of communication with Wentworth students. All WIT students are required to activate their WIT email accounts. Students who prefer to use an email service other than the WIT email as their primary account, must arrange for messages sent to the official address to be forwarded to the preferred email address. All academic offices and other WIT administrative offices use the WIT email account as a means of conveying important information to students. It is the responsibility of each student to be aware of the information sent by email.

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 logins utilize Microsoft Active Directory to authenticate the user. The password 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 they/them/theirs 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://catalog.wit.edu/academic-policies-procedures/ug/complaint-procedures/Online_Complaint_Recommendation_01_2019.pdf)
- Compliant Agencies for Students Outside of Massachusetts (<https://catalog.wit.edu/academic-policies-procedures/ug/complaint-procedures/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.

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 Bright Space Learning Management System (LMS) and participate in at least two (2) "Academic Activities" each week:

- At least one Academic Activity by midnight ET Wednesday (or by Day 3) each week.
- At least one additional Academic Activity by midnight ET Sunday (or by Day 7) 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.

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.

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

Academic Year	Cumulative Credits	Minimum GPA
Freshman	0-31	1.75
Sophomore	32-63	2.00
Junior	64-95	2.00
Senior	96-139	2.00
5th Year	140+	2.00

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.

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 one week after final grades are posted to their academic record.

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 student success advisor or 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. Academic 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 Academic 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 Academic Probation are encouraged to take advantage of the resources of the University including their primary advisor, the Student Success Studio, and the Center for Wellness, to develop strategies for success in their academic life.

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. Semester registration for those students whose appeal was granted will remain active. All registrations will be canceled for all future semesters for students whose appeal was denied or did not submit an appeal; fall, spring and summer. Students have the option to submit a request for reinstatement from academic dismissal following a period of one required semester from the last semester enrolled. Requests for Reinstatement from Academic Dismissal must be submitted to the dean or associate dean of their degree program at least 15 days prior to the first day of class of the returning semester prior to being processed by the Registrar.

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 associate dean. 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 or student success 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

Grade	Weight	Numerical Definition	Definition
A	4	93-100	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.
A-	3.67	90-92	
B+	3.33	87-89	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.
B	3	83-86	
B-	2.67	80-82	
C+	2.33	77-79	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.
C	2	73-76	
C-	1.67	70-72	
D+	1.33	67-69	Student learning and accomplishment based on the published objectives for the course/test/assignment were met with minimum passing achievement.
D	1	60-66	
F	0	0-59	Student learning and accomplishment based on the published objectives for the course/test/assignment were not sufficiently addressed or met.
P	0		Pass (for credit)
S	0		Satisfactory (no credit)
U	0		Unsatisfactory (no credit)
W	0		Withdrew
IC	0		Incomplete (temporary)
NR	0		Grade Not Reported by Instructor

Wentworth does not offer students the option to audit a course; if a student is granted an exception to this policy the course cannot be converted at any time to a credit bearing course and will not satisfy a degree requirement.

Incomplete Grades Policy

A temporary grade of "IC" may be issued 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. If course instructor cannot be reached or is no longer at Wentworth, the student should contact the associate dean of the course. 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 semester the outstanding coursework must be completed and a final grade submitted to the Registrar prior to the first day of class or the student will be dropped from the course for having not met the prerequisite.

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

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 in the GPA. 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.

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 MyWentworth 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. Dean or designee of the school administering the final 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 attempting at least 12 credits and part-time undergraduate degree program (AENT, ABCM, BBCM, BPM or BSFM) students attempting at least 6 credits who achieve a semester grade point average of 3.50 or higher, with all grades at least "C" for the semester, are recognized for their scholastic achievement by placement on the Dean's List. Students with IC grades at the time Dean's List are awarded are not eligible for the award for that semester. A Dean's List notation is posted to the student's official transcript following each semester grading period.

Graduation

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.

Graduation Criteria

Curriculum leading to bachelors 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 20 distributed general education credits for degree-seeking students in the School of Engineering and the School of Computing and Data Science and 28 credits for degree seeking students in the School of Architecture and Design, the School of Management and the School of Sciences and Humanities , the requirements of the declared major, and two semesters of required co-op.
- Satisfactory completion of all requirements for a bachelors degree must be under a catalog in effect within two years of the date of graduation. The catalog used, however, may be no earlier than 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 bachelors degree program must be completed at Wentworth Institute of Technology.
- A minimum cumulative GPA of 2.0 or higher and any other academic requirements of the students major as outlined by the academic unit.
- A minimum cumulative GPA of 2.0 or higher is required for an associate degree.

- Students will not receive their diplomas or transcripts until all financial obligations to the University have been met.
- Conferral of a degree occurs when the registrar finalizes the student's academic record and confirms that all requirements have been satisfied, which includes "IC" grades. Students who complete remaining requirements outside of the University; the degree date will be determined based upon the date the official documents are received by the registrar, not the date the course was completed. The degree date will be in accordance with the timeline for conferral of degree in April, August or December.
- 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 Honors

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.

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 Associate Director of Operations and Degree Certification at registrar@wit.edu if they have met the following criteria and are preregistered for the remaining requirements in the upcoming semester:

- Must have a cumulative GPA of 2.0 and must meet one of the following criteria:
- No more than eight remaining credits,
- One semester of required cooperative education,
- Four credits maximum and one required co-op semester,
- Exceptions that fall beyond those listed require approval of the provost. If approval is granted, the information will be sent to the Associate Director of Operations and Degree Certification and entered the student's permanent record.

Students approved under the walk-on policy will not appear in the Commencement program and must resubmit a new graduation application when all outstanding degree requirements have been met. Failure to do so may delay the awarding of a degree.

Students who have successfully completed all requirements for the degree before a specific graduation date are eligible to receive the degree as of that date. A diploma will not be awarded before all work is completed or before the date of graduation. Upon degree conferral the academic record is sealed; grade changes and the addition of a minor or certificate are not permitted after official award date of an undergraduate degree. Students who do not successfully complete their degree requirements because of their final grades and who are not registered for the next semester will be officially withdrawn from the University. The effective date of the withdrawal will be reported as the final day of classes for the last semester in attendance.

Humanities & Social Science Requirement

Students enrolled in degree programs in the School of Engineering and the School of Computing and Data Science must complete a minimum of 20 credits and students enrolled in degree programs in the School of Architecture and Design, the School of Management and the School of Sciences and Humanities must complete a minimum of 28 credits including an English Sequence, at least one course in humanities (HIST, HUMN, LITR or PHIL), at least one course in social science (COMM, ECON, POLS, PSYC, or SOCL) and the remaining courses from either the humanities or social sciences category. Students whose English Sequence requires 3 English courses may use the third English course to satisfy a humanities elective requirement. Students in programs with Directed HSS Electives may use the directed course to satisfy the humanities or social science as determined by that HSS course. Courses with the prefix of HSSI are interdisciplinary and may count for either a humanities or social science.

Directed HSS Electives

HSS Directed Electives are specific humanities or social science course/s (e.g. ECON4102), or an HSS discipline (e.g. Ethics), which an academic unit has determined would be beneficial or necessary in the program's curriculum. Program specific Directed Electives are noted on the student's degree audit.

General Electives

Programs that identify a general elective as part of the degree requirements will appear on a student's degree audit for a specific semester. Students are advised to discuss their options with their primary advisor prior to registering for courses.

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

Returning Students

- Preregistration for returning and continuing undergraduate students is held in October for the spring semester, February for the summer session and in March for the fall semester. Prior to Fall and Spring registration a Registration Access Code (RAC Code) or Alternate

Pin is required for all freshman and sophomore level students, for all students with an academic sanctions of Probation or Continued Probation prior to registering for classes and for all students returning from medical leave of absence or prior academic sanctions.. The Registration Access Code (RAC Code) or Alternate Pin is obtained from the student's primary advisor or student success advisor. For course registration that requires permission to register, students should contact the academic unit offering the course prior to the schedule date to register. Students are required to resolve all holds placed on their student account before they can register for classes.

- **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.

New Students

- **Registration for newly accepted First Year and New Transfer** occurs during the summer prior to the student's matriculation in the fall semester. First Year students register for their courses during New Student Orientation. New Transfer students are registered by the associate dean of their program and the registrar prior to their arrival. New transfer student schedules are developed based upon awarded transfer credit to best fulfill their curricular requirements.
- **All First Year and New Transfer students** are required to meet with their primary advisor or student success 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 unit offering the course prior to the schedule date to register.

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 the cross-registration application through the COF Registration Portal (<http://www.colleges-fenway.org/academics/cross-registration/>).

Full-time undergraduate degree-seeking 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 students should refer to the Transfer credit database. For courses not listed in the database students must complete a Transfer Credit Pre-Approval Form (<https://wit.edu/ssc/forms/>) and

submit to the dean or associate dean of the appropriate for review and approval.

Registration and Class Standing

Fall, Spring and Summer registration days are determined by the students class standing which is determined by the number of completed credits at the time of each preregistration period. It does not include credit hours for courses in progress or the number of semesters a student has attended the University.

Undergraduate

Class Year	Earned Credit Hours
Freshman	0-31
Sophomore	32-63
Junior	64-95
Senior	96-139
Fifth Year	140+

Part-time Programs

Class Year	Earned Credit Hours
First Year	0-29
Second Year	30-49
Third Year	50-73
Fourth Year	74-93
Fifth Year	94-113
Sixth Year	114+

Course Load

Full-time undergraduate status requires 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.
- COOP3500 and COOP4500 are considered full-time.
 - COOP4699 is considered less than full time enrollment status and will impact financial aid enrollment status.
 - Optional Co-op's COOP3000 and COOP5000 are considered as not enrolled and will impact financial aid enrollment status. Students are urged to speak with their Financial Aid Advisor.
- A full-time student may not schedule an overload of courses without the approval of the associate dean of their program 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 approved. 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. 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/>) and

submit it to the Registrar at registrar@wit.edu no later than the deadline published in the Academic Calendar. 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 seek to withdraw from a course are required to obtain the written permission of the Director of International Student Services; International students must be full-time to maintain valid F-1 Student Visa status.

Course Time-Conflicts

Time conflicts of courses are not normally permitted. Students whose courses conflict should meet with the associate dean of their program to develop an appropriate alternative schedule and a curriculum plan. Under exceptional circumstances, students may register for courses with otherwise unsolvable time conflicts by obtaining the Time Conflict Override form (<https://wit.edu/ssc/forms/>). Overrides are processed at the School level.

Transfer Credit after Matriculation

To receive credit for courses taken at another accredited institution, degree-seeking undergraduate students must obtain approval in advance if the course does not appear on the Transfer Credit Database. Students who intend to use transfer credit to satisfy a required elective for their degree program must obtain an additional approval for the course from the dean or associate dean of the school. Failure to obtain approval for courses that are not listed in the transfer credit database or to satisfy a required degree elective 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 (<https://wit.edu/ssc/forms/>). Requests for approval of a course from another institution should be accompanied by the course description or corresponding syllabus from that institutions 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 at transfercredit@wit.edu upon successful completion of the course. A student who fails a course at Wentworth may choose to complete the course at another institution and must follow the pre-approval process. If the course is completed at another institution with a grade of "C" or higher, the transfer grade of "TR" satisfies the course requirement, but does not eliminate the initial "F" from the student's GPA.

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". Final grades of "P" are not accepted for transfer to the university unless the grade scheme on the official transcript defines a "P" as a grade of "C" or higher. 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** who intend 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 do not satisfy program requirements. Final grades of "P" are not accepted for transfer to the university unless the grade scheme on the official transcript defines a "P" as a grade of "C" or higher. It is the responsibility of First Years students who have earned Dual Enrollment (DE) credit while in high

school to submit an official transcript issued from the sponsoring college or university prior to the start of their first enrolled semester, failure to do so may result in forfeiture of otherwise transferable credit. AP/IB credit or courses completed at other institutions more than 5 years prior to the first semester a student is enrolled in a degree seeking program will not be accepted for credit.

Residency Requirement

Students enrolled in associate or bachelors degree-granting program must complete a minimum of 50% of their total credit hours at the University.

Transcripts

The Wentworth Institute of Technology transcript is an official document reflecting a student's cumulative academic record. An official e-transcript is reproduced on colored paper stock bearing the seal of the University 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 the University 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 seven to ten business days to process or may be further delayed if incomplete information is submitted at the time of the request.

All outstanding debts must be satisfied prior to release of a transcript. Requests for transcripts should include dates of attendance, graduation, name at the time of attendance, declared major, and WID number, if available. Omission of any of the aforementioned list unless otherwise noted or inaccurate information will delay the processing of the request; there is no fee for transcripts. Wentworth no longer produces hard copies of official transcripts for any requests with dates of attendance after 1985.

Transfer Credit

Transfer Credit Policy

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 but not satisfy program requirements. No academic credit is awarded for Internships/COOP's, Practicum, Directed Research, Preparatory, Workforce Training, Professional Development, Continuing Education or remedial course work or for courses with grades of "P" or "S". Credit that was completed more than 5 years prior to the first semester enrolled in a degree seeking program will not be accepted, this includes AP/IB credit. Grades for coursework completed at another institution are not recorded on the students' official transcript, transfer credit is assigned "TR".

Residency Requirement

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

Institute of Technology. Sometimes, even when courses transfer to Wentworth, they will not fulfill program requirements for a specific major.

Transfer Credit Evaluation

Transfer student applicants will receive an initial transfer credit evaluation after they have applied and submitted their college transcripts. A transfer credit evaluation cannot be created until transcripts are received by the Office of Admissions. The transfer credit evaluation will include all college courses that are eligible to transfer to Wentworth, and what the transfer equivalency of the course is. Deposited students will receive an updated version of their evaluation, as well as a class schedule for their first semester at Wentworth. For more information about transfer credit evaluations, please visit our Transfer Credit Webpage (<https://wit.edu/learning/registrar/transfer/>).

Transfer Credit Pre-Approval

The Transfer Credit Pre-Approval Form is available on the Transfer Credit Webpage (<https://wit.edu/learning/registrar/transfer/>). Requests for approval of a course from another institution should be accompanied by the course description or corresponding syllabus from that institutions 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 at transfercredit@wit.edu upon successful completion of the course. A course will transfer to Wentworth for the same amount of credit awarded at the transfer institution. If a course is 3 credits at the transfer institution, and the equivalent course is worth 4 credits at Wentworth, the course will transfer to Wentworth for 3 credits, not 4. The Pre-Approval only confirms that credit will be awarded for a course taken outside of the institution, but it is up to the School and degree program how the course will be applied to a student's degree requirements. For this reason, students should obtain the signature of their dean or associate dean before enrolling in a course outside of Wentworth to ensure that the transfer course will fulfill a program requirement.

A student who fails a course at Wentworth may choose to complete the course at another institution and must follow the pre-approval process. If the course is completed at another institution with a grade of "C" or higher, the transfer grade of "TR" satisfies the course requirement, but does not eliminate the initial "F" from the student's GPA.

Transfer of Military Credit

Servicemembers from the Army, Marine Corps, Air/Space Force, or Coast Guard may have acquired college-level learning from their formal military training. This training may have been evaluated for college credit by the American Council on Education (ACE) through the Joint Service Transcript (JST) program. If such an evaluation exists, Wentworth can accept the credits which are determined through Wentworth's transfer evaluation process in collaboration with schools and Military-Connected Services. Servicemembers who have acquired college-level learning from their formal military training through the Air Force, may have been evaluated for college credit by the Air University, which includes the Community College of the Air Force (CCAF). Air University is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award the associate and baccalaureate degrees.

Study Abroad Semester Transfer Credit

All courses taken during a study abroad semester that is not officially sponsored by Wentworth require pre-approval from the appropriate dean or associate dean responsible for the course to determine if the courses will satisfy requirements within their degree program and are submitted to the transfercredit@wit.edu on a completed Transfer Credit Pre-approval form. For courses taken during a study abroad program

that are officially sponsored by Wentworth and have established course equivalencies also require the approval of the dean or associate dean of the student's degree program. Courses completed that have not been pre-approved may not be accepted, thus will not become part of the student's WIT academic record. 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 transcript in a timely manner and must be sent to transfercredit@wit.edu. Degrees conferred for students who participate in a Student Abroad Program during their final semester will be awarded their degree based upon the date the official transcript is received by the Registrar. In some cases the degree will be delayed until the next degree conferral date.

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

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. All information about Advanced Placement, International Baccalaureate, College Level Examination Program, and Project Lead the Way (<https://catalog.wit.edu/academic-policies-procedures/ug/college-level-exams/>) credit can be found on our Advanced Placement, International Baccalaureate, College Level Examination Program, and Project Lead the Way Catalog (<https://catalog.wit.edu/academic-policies-procedures/ug/college-level-exams/>) Page. Courses completed 5 or more years prior to the first semester enrolled in a degree seeking program are ineligible for transfer to Wentworth.

Transfer Student Schedule & Registration

Deposited students will receive an updated version of their evaluation, as well as a class schedule for their first semester at Wentworth in addition to their anticipated graduation date, which will be determined by their school. New transfer student schedules are developed based upon awarded transfer credit to best fulfill their curricular requirements by the associate dean of their school and are registered for these courses by the Registrar's Office. New Transfer students are required to meet with their primary advisor or student success 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 unit offering the course prior to the schedule date to register. For more information about Registration, please visit the Registration Catalog Page. (<https://catalog.wit.edu/academic-policies-procedures/ug/registration/>)

Grade Replacement

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. For more information about Grading, please visit the Grading Catalog (<https://catalog.wit.edu/academic-policies-procedures/ug/grading/>) Page

Undergraduate Degrees

Degrees Awarded

The following undergraduate degrees are awarded by Wentworth Institute of Technology

- Associates in Science
- Bachelor of Science
- Professional Undergraduate Certificates

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 Registrar (registrar@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 associate dean. Students who submit a request 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. Students may submit an appeal to the 5 year rule for courses completed at Wentworth with a final grade of B or higher. The appeal must accompany the Request for Academic Reinstatement to be considered. All requests for reinstatement must have the approval of the dean or associate dean.

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 associate dean of the program 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.

WIT Academic Credit

WIT Academic Credit Awarded for Academic Engagement

Credits Awarded	Minutes of "Academic Engagement" ¹	Clock Hour	50-minute "Hour"
1	2,250 (37.5 hours)	45	37.5
2	4,500 (75 hours)	90	75
3	6,750 (112.5 hours)	135	112.5
4	9,000 (150 hours)	180	150
5	150	225	187.5
6	13,500 (225 hours)	270	225

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 hour¹ 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.

Non-Academic Student Affairs Title IX Coordinator - Title IX related records community to identify the student with reasonable certainty, information requested by a person whom Wentworth believes know 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 (registrar@wit.edu) written requests that identify the record(s) they would like 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):

Education Records

Type	Location	Custodian
Academic Records	Office of the Registrar	Registrar
Admissions Files for students currently enrolled or have a history of enrollment	Office of the Registrar	Registrar
Admissions Files for students in pre-enrollment status	Part-time programs Admissions	Director of Marketing and Admissions
Enrollment Records	Office of the Registrar	Registrar
Career Services Records	Center for Cooperative Education and Career Development	Director of Center for Cooperative Education and Career Development
Counseling and Academic Placement Testing Records	Center for Wellness	Director of Counseling
Academic Records (grades, transcripts)	Office of the Registrar	Registrar
Academic Disciplinary Records	Office of the Provost; Office of the School Dean; and/or Associate Dean	Provost; Academic Discipline Board; School Dean and/or Associate Dean
Non-Academic Disciplinary Records	Student Affairs	Dean of Students

Type	Location	Custodian
Financial Aid Records	Student Service Center	Director of Financial Aid
Cross-registration records with Colleges of the Fenway	Office of the Registrar	Registrar
Terms Abroad (WIT)	Associate Dean and Office of the Provost	Associate Dean of the Program and Academic Affairs
Service learning records	Center for Community and Learning Partnerships	Director of the Center for Community and Learning Partnerships

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. In cases involving Title IX related matters, membership will include the Title IX Coordinator.

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 dependent 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.
- p. In Title IX related matters, advisors for the students will receive documentation in accordance with the law.

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 20202-5920

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 decides 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 (registrar@wit.edu).

6. FERPA and Virtual Learning Related Resources March 2020

As if educators and students move to virtual learning during this time of social distancing due to COVID- 19, the Department of Education's Student Student Privacy Policy Office (SPPO) has received questions about available resources on virtual learning and the Family Educational Rights and Privacy Act (FERPA).

FERPA is the federal law that protects the privacy of personally identifiable information (PII) in students' education records.

"Education records" are those records that are: (1) directly related to a student; and (2) maintained by an educational agency or institution or by a party acting for the agency or institution. **FERPA Consent for Virtual Learning, Classroom Recordings and Media Release.**

FERPA provides parents and eligible students the right to access a student's education records, the right to seek to have the records amended, and the right to protect the PII in students' education records. (An "eligible student" is a student who has turned 18 or is attending college at any age.) Under FERPA, an educational agency or institution may not disclose PII from students' education records, without consent, unless the disclosure meets an exception under FERPA. 20 U.S.C. 1232g; 34 C.F.R. Part 99.

Two key resources on our website are:

- *Protecting Student Privacy While Using Online Educational Services: Requirements and Best Practices* – this resource identifies applicable exceptions under FERPA, including the school official exception. This resource, while originally developed for online educational services, is also applicable for virtual learning tools and includes best practices for safeguarding student education records under FERPA.
- *Protecting Student Privacy While Using Online Educational Services: Model Terms of Service* –this checklist is a helpful tool to evaluate online educational apps.

These two resources are part of the Security Best Practices (<https://studentprivacy.ed.gov/security/>), which includes additional resources on safeguarding education records.

There are also additional resources on related topics under FERPA, including classroom observations, use of emails, videos, and other virtual learning tools. Under FERPA, the determination of who can observe a virtual classroom, similar to an in-person classroom, is a local school decision as teachers generally do not disclose personally identifiable information from a student's education record during classroom instruction. FERPA neither requires nor prohibits individuals from observing a classroom.

- Our Letter to Mamas (<https://studentprivacy.ed.gov/resources/letter-mamas/>) on classroom observation is also applicable to virtual classrooms.
- Our video, Email and Student Privacy (<https://studentprivacy.ed.gov/training/email-and-student-privacy/>), identifies best practices for emails.
- With regard to videos and virtual classrooms, to the extent videos are recorded and maintained as education records, the FAQs on Photos and Videos under FERPA (<https://studentprivacy.ed.gov/faq/faqs-photos-and-videos-under-ferpa/>) might be useful.

Additionally, the recently-released FERPA and the Coronavirus Disease 2019 (COVID-19) FAQs (<https://studentprivacy.ed.gov/resources/ferpa-and-coronavirus-disease-2019-covid-19/>) document identifies questions for school officials regarding the health or safety emergency exception under FERPA in the context of COVID-19.

SPPO is available to assist you with your student privacy questions under FERPA. Additional information is on our website at <https://studentprivacy.ed.gov> (<https://studentprivacy.ed.gov>)

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, pandemics, 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.

Wentworth Institute of Technology reserves the sole right to promulgate and change rules and regulations and to make changes of any nature in its program# calendar# admissions policies, procedures, and standards# degree requirements# fees# and academic schedule whenever necessary or desirable, including, without limitation, changes in course content and class schedule, the cancellation of scheduled classes and other academic activities, and the substitution of alternatives for scheduled classes and other academic activities, including remote learning. In any such case, the University will give whatever notice is reasonably practical.

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 where students would not have an expectation of privacy. Your presence on campus and at campus events constitutes your consent to capture and/or use your image or likeness. 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.

Wentworth Institute of Technology does not collect release forms from its students for the use of photographs, videos, and audio recordings. Wentworth understands that there may be students who prefer to not be photographed or have their imaged used and can opt-out by contacting Student Affairs and completing a photo opt out waiver. Those who do not want to be photographed or recorded are responsible for notifying the camera operator of their opt-out status and/or removing themselves from any event where photographs/videography are in use. Failure to do so may result in the student's inclusion in a photograph or recording and will be treated as a release.

Nondiscrimination Policy

Wentworth Institute of Technology values diversity, equity, and inclusion. The University is committed to providing a safe and respectful educational experience and work environment free from discrimination and harassment on the basis of an individual's race, color, religion, gender, age, marital status, national origin, ancestry, citizenship, physical or mental disability, sexual orientation, gender identity or expression, genetic information or any other characteristic protected by law.

Information about the right to be free from discrimination can be found online in the **University's Non-Discrimination Policy** and in the **Wentworth Institute of Technology Sexual Misconduct & Sex-based Discrimination Policy for Students and Employees**.

Individuals seeking to file a report related to discrimination, discriminatory harassment, bias-motivated acts and behaviors, or sexual misconduct may file a report by contacting Catlin Wells in the Office of Institutional Equity.

Catlin Wells
Executive Director of Equity and Compliance/Title IX Coordinator
CEIS 205
wellsc1@wit.edu
(617)989-4119

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 Misconduct and Sex-based Discrimination

Wentworth Institute of Technology (University) is committed to maintaining a safe and inclusive living, learning, and working environment for all members of the community. All members of the University are responsible for maintaining an environment free from sexual discrimination and harassment and are expected to commit themselves to be examples of the highest standards of personal and professional conduct.

The Sexual Misconduct & Sex-based Discrimination Policy for Students and Employees can be accessed online at: <https://wit.edu/about/policies/title-ix>. Pursuant to this policy, The University will respond to all allegations of Prohibited Conduct in a prompt, fair, and impartial manner.

Any person may report Prohibited Conduct through the online reporting form (https://cm.maxient.com/reportingform.php?Wentworth&layout_id=2) or by contacting the Title IX Coordinator. Retaliation against those who make a complaint or participate in a related grievance process, is strictly prohibited.

The Title IX Coordinator can be contacted in person, by telephone, email, or in person during regular business hours (Monday-Friday 8:15 AM to 4:45 PM):

Catlin Wells
Executive Director of Equity and Compliance/Title IX Coordinator
CEIS 204
wellsc1@wit.edu
(617)989-4119

Storm Cancellation

Whenever inclement weather is a factor, all students, faculty, and staff are encouraged to check the Institute's website (wit.edu (<https://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 the academic units 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 complete the Voluntary Disclosure form (https://wentworth.az1.qualtrics.com/jfe/form/SV_8fceW2aXhHg52eh/), submit appropriate documentation of a disability, and schedule an appointment with Accessibility Services.

Please contact Accessibilityservices@wit.edu with any questions or to schedule an appointment.

ACADEMIC RESOURCES

Academic Advising

Academic Advising is a collaborative relationship with the intent of assisting students in developing meaningful educational goals that are consistent with personal interests, values and abilities. It is a student-centric, holistic, campus-wide collaborative effort that empowers students to take responsibility for their own learning and experiences as they progress in meeting their goals.

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.

New students are advised by a Student Success Advisor in their first year. Beginning in sophomore year, students work with an advisor in their Major who continues to guide them in their academic experience.

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

Student Success Advisor

The Student Success Advisor is part of a network of people focused on student success. They work with students on their academic plans, monitor student academic progress, review academic policies and procedures when necessary, and ensure completion of graduation requirements. Student Success 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.

Faculty Advisor/Mentor

A Faculty Advisor/Mentor counsels students on curricular matters and answer questions regarding student career and educational objectives. Your faculty mentor will guide you as you study in your major, refine your goals, and connect your learning to your CO-OP and career choices.

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 7,500 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.

Success Studio

The Success Studio is a physical and virtual space that is home to an integrated, one-stop-shop dedicated to seamless student success. The Success Studio includes academic advising, academic support, students accessibility services, resources and workshops to support students' in reaching their goals. It is located on the third floor of Beatty Hall.

Success Studio programs and services are included in tuition and available to all Wentworth students. Student Success Advisors are professional staff members who are available to assist students with schedules, academic plans, and academic success strategies. The Studio also provides in-person and virtual appointment-based peer and professional tutoring, as well as drop-in study group programs. 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 preparation and planning advising, manages the Cooperative Education program, and provides numerous opportunities to network with employers.

Advising

CO-OPS + CAREERS staff help students and alumni, at any point in their college or post-college experience, develop career readiness skills following the National Association of Colleges and Employers (NACE) Career Competencies. (<https://www.naceweb.org/career-readiness/competencies/career-readiness-defined/>)

Cooperative Education (Co-op)

As a requirement for graduation, undergraduate full-time students complete two Cooperative Education semesters, typically one in each of the junior and senior years, with exceptions for a few majors. Students are responsible for implementing a successful co-op job search, with the support of their CO-OP + CAREER Advisor. Students must adhere to the co-op requirements (<https://coopsandcareers.wit.edu/channels/finalize-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/>), Wentworth's on-line career management system. Enrollment in a mandatory co-op course (COOP3500 and COOP4500 for undergraduates and COOP6500 for some graduate

students) maintains full-time student status. Enrollment in COOP4699, CO-OP Professional Development, may be an option if a student is unable to secure a traditional co-op. COOP4699 enrollment changes enrollment status to less than half-time and impacts financial aid for that semester. Enrollment status may be impacted if students do not obtain a co-op, meet the co-op requirements, and/or adhere to published deadlines.

Students are strongly discouraged from taking classes during their co-op semester. With approval from their academic dean and CO-OP + CAREER Advisor, in rare circumstances, a student may take up to 8 credits. The co-op overload form (<https://wit.edu/ssc/forms/>) is required.

Transfer students must complete at least one semester of classes and meet academic standing requirements at Wentworth before becoming eligible to participate in the Cooperative Education program.

Students must be in good academic standing to enroll in a co-op, with a GPA of 2.0. Students not meeting this standard by the end of the semester immediately preceding their co-op term will not be eligible for co-op. Students with a GPA below 2.0 and are registered for co-op 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 at the time. Students with a GPA of 1.9-1.99 may seek approval to register for co-op.

Students must meet the co-op requirements as outlined in the Terms & Conditions (<https://coopsandcareers.wit.edu/channels/finalize-your-co-op/>) and complete the co-op as detailed in their approved Report of Hire (<https://wit-csm.symplicity.com/students/>) form. Once approved, the Report of Hire form must not be altered by the student. The CO-OP + CAREER 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 Wentworth with substantial work experience in their major field. With the approval of 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 submit an Industry Professional Credit (IPC) petition to the CO-OPS + CAREERS Office to be considered.

Two semesters of non-mandatory co-op education are also offered. The first is COOP3000, usually registered for in the summer prior to junior year for students who have completed their prerequisites for junior year classes and are in good academic standing. The other, COOP5000, is for students who have successfully completed their two required semesters of co-op and obtained permission from their academic unit and CO-OP + CAREER Advisor. Registration for COOP3000 and COOP5000 will impact a student's full-time status, financial aid, and housing. Students are urged to speak with their Financial Aid Advisors to understand the impact enrollment in COOP3000 or COOP5000 will have on their enrollment status. Wentworth does not accept co-op experiences from prior institutions.

Co-op Schedule

The required Co-op semesters for each program are outlined in the program details specific to each major. Graduate students enrolled in the 2 year or 3 year MARC program are required to enroll in COOP6500.

Co-op Institute

This interactive course COOP2500 provides students with the skills and knowledge needed to successfully obtain and keep a co-op position. Students are taught by their CO-OP + CAREER 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 and students register on LeopardWeb.

Career Tools

Through WITworks, CO-OP + CAREER Fairs and Expos, 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.

The CO-OPS + CAREERS staff provide many additional resources to assist students in their co-op search and career development. There are printed resources available in our office and throughout campus, online resources on the CO-OPS + CAREERS website, the award winning WITWorks Radio show, and the WITS Happening 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. You can find resources for graduate school planning under "Students" on our website. (<https://coopsandcareers.wit.edu/>)

Workforce Development & Professional Education

**Valerie Paquette, Executive Director
Wentworth Hall, Room 108C
(617) 989-4483
paquettev@wit.edu**

Lifelong learning is a tradition at Wentworth Institute of Technology. The WIT Workforce Development & Professional Education division supports learners to achieve their educational and career goals with part-time evening, weekend, and online programs designed to accommodate busy lifestyles. The Workforce Development & Professional Education team works directly with corporations, industry experts, and our community partners to develop market driven, career accelerating education and development opportunities for our lifelong learner population.

Wentworth has a long tradition of offering specialized workforce training and development programs to people who are:

- interested in advancing their careers through acquisition of job-relevant knowledge, skills, and abilities.
- eager to obtain industry recognized credentials.
- ready to advance into more senior levels of supervision and leadership

Taught by instructors who are active and experienced in their fields, these short form and customized programs provide learners with the experience and credentials needed to make them competitive in today's job market. Several programs offer skills for licensing and certification. Please view the WFPE website (<https://wit.edu/academics/workforce-development>).

Workforce Training Programs: Non-Credit (CEU) Certificate

Managing Construction Projects

Wentworth's Managing Construction Projects Certificate is designed for individuals who are interested in transitioning into a management-focused position in the construction industry. Students in this program build core competencies in management theory, estimating, scheduling, control, contracts, and codes. This program is conveniently formatted for adult learners, with fast-paced seven-week courses that allow you to quickly gain career-enhancing skills. A certificate in managing construction projects will be awarded upon successful completion of the required courses

Workforce Training Programs: Non-Credit (CEU) Programs

Journeyman Electrician

Wentworth offers an accelerated, four semester journeyman electrician programs to prepare individuals to become licensed Journeyman Electrician in the Commonwealth of Massachusetts. A variety of theoretical and applied concepts will be covered in each course, with the overarching intent of journeyman electrician license preparation. Each class will devote a significant portion of time covering the Massachusetts Electrical Code. This program is conveniently designed for busy adults with a sequence of evening courses.

Construction Supervisor License, Test Prep Course

Become a licensed Construction Supervisor in the Commonwealth of Massachusetts. Wentworth's Construction Supervisor's License (CSL) Preparation will prepare you to take the state licensure exam for commercial and residential buildings. This license allows you to supervise construction for any single- or two-family dwelling or appurtenant structure, regardless of size, as well as any other building type up to 35,000 cubic feet of enclosed space.

Douglas D. Schumann Library & Learning Commons

Beatty Hall Second and Mezzanine Floors

(617) 989-4040, Text: (617) 600-5989

Website: <https://library.wit.edu/> (<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 a range of 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.

Borrowing

The Library's collection includes books, DVDs, and a variety of technology items, such as chargers, cables, and other accessories. The Library also 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 for updates (<https://library.wit.edu/tech-sandbox/technology-lending/>) and borrowing policies (<https://library.wit.edu/borrow-and-request/>).

Wentworth community members may also borrow materials from other libraries in our consortium, Fenway Library Organization (FLO), or from libraries around the world via our Interlibrary Loan service (ILL).

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. Librarians at the Douglas D. Schumann Library & Learning Commons help students learn to identify, evaluate, and select the information resources best suited to their needs. 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. These materials may be requested online through the Schumann Library catalog or in person at FLO libraries. 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, and New England College of Optometry. Information about borrowing from other FLO libraries is available through the library website.

Teaching & Learning Collaborative

Tes Cotter Zakrajewski, Ed.D Senior Director

Teaching & Learning Collaborative

Digital Technology Services

Beatty 318 (617) 989-4989, teach@wit.edu

Teaching & Learning Collaborative (TLC) is dedicated to supporting academic excellence by awakening, nurturing, and empowering all faculty and staff members to be effective educators able to ensure quality student learning at Wentworth Institute of Technology. The TLC team are passionate educators who promote inclusive, engaging, active learning experiences for students here at Wentworth. We are *partners to your best teaching* to transform learning!

We Imagine educators sparking student potential as lifelong learners who change the world. We Amplify the possible through innovative instructional support services scaffolded by pedagogical practices and a modern digital learning ecosystem. We partner through collaborative, creative, evidence-based learning practices that support student success. We build relationships and collaborate with Wentworth community members to understand your needs and help deliver student-centric, interactive teaching and learning experiences aligned with program and University goals.

Visit our **Teaching & Learning Hub** to access a wealth of teaching materials, resource guides, step by step infographics, video trainings, webinars, calendar of events, and book a consultation. Explore **TLC services**, including consultations, learning partners, Brightspace, professional development, class observations, student engagement, course design, and accessibility to name a few. Our primary audience is faculty and staff

Technology Services DTS

Tech Spot

Beatty Hall, Room 320

Help Desk (617) 989-4500, techspot@wit.edu

[wit.edu/dts \(<http://wit.edu/dts/>\)](http://wit.edu/dts/)

Learning Innovation and Technology

Beatty Hall, Room 318

(617) 989-4989

lit@wit.edu

[wit.edu/lit \(<http://wit.edu/lit/>\)](http://wit.edu/lit/)

Technology Services supports all aspects of technology at the Institute.

Vision

Learn, Apply, and Create with No Boundaries!

Mission

Amplify the University experience through exceptional partnerships, practices, and digital solutions

Divisional Goals

- Digital Learning Ecosystem: We aspire to build a web and mobile enabled digital platform that is open, accessible, adaptive, secure, distributed, and intuitive; one that enables the Wentworth community to realize its vision of next generation teaching and learning
- Data Enabled Decision Making: Address Wentworth's impending need for data-enabled decision-making by orchestrating a carefully planned long-term Application, Data and Reporting modernization roadmap
- Resilient and Secure Core: Build and maintain Wentworth's IT infrastructure that is robust, resilient, fault tolerant, and can support current and future requirements to realize the vision of a digital learning ecosystem for our students and faculty; a modern work environment for staff; and an exceptional digital experience in Wentworth's physical and virtual spaces
- Digital Service Transformations: Transform the University experience through a series of micro and macro transformations targeted to build new, unique, and impactful digital services by leveraging capabilities in collaboration and communication systems, and exploring emerging technologies like Artificial Intelligence, Blockchain, Augmented/Virtual Reality and eSports by supporting key partners and innovators across the campus
- Customer Service Enhancements: Building upon the solid foundation of customer service, explore new partnerships, avenues, and services to address the evolved needs of our campus

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

Cheryl Aaron, Director

Nelson Recreation Center Room 202A

(617) 989-4159

Varsity Sports

Wentworth sponsors 18 varsity sports teams (baseball (men's), basketball (men's & women's), cross country (men's), golf (men's), ice hockey (men's), lacrosse (men's & women's), rowing (men's), soccer (men's & women's), softball (women's), tennis (men's & women's), indoor track & field (men's), outdoor track & field (men's), and volleyball (men's & women's). 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

Wentworth sponsors 17 varsity sports teams (baseball (men's), basketball (men's & women's), cross country (men's & women's), golf (men's), ice hockey (men's), lacrosse (men's & women's), soccer (men's & women's), softball (women's), tennis (men's), indoor track & field (mixed), outdoor track & field (mixed), and volleyball (men's & women's), and offers students the opportunity to participate in intramural, club, and recreational athletic programs through the Colleges of the Fenway and the Center for Wellness.

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).

Specific information regarding varsity sports is available in the Athletic Department Office, located on the second floor of the Nelson Recreation Center. Schedules, game scores, contact information, and athletics-related news can be found on the Wentworth Athletics website (<http://www.wentworthathletics.com> (<http://www.wentworthathletics.com/>)).

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, a synthetically surfaced 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 ([http://www.wit.edu/clp/](http://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 has 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 Life

The Center for Student Life is dedicated to enriching a student's experience outside of the classroom as well as support their transitions while attending Wentworth. The Center for Student Life is located in Beatty 026.

Student Engagement

Student Organizations

Student Organizations help students find their sense of belonging outside of the classroom and engage with their academic and social interests. A complete listing of student organizations may be found at <https://wit.campuslabs.com/engage> (<https://wit.campuslabs.com/engage/>). The Involvement Fairs in September and January give all students an opportunity to connect with groups.

Leadership

Students may self-select to participate in the leadership seminars and programs offered by the Center for Student Life. These programs are designed to teach a variety of leadership skills and approaches, to engage students in the practice of leadership, and opportunities to develop a personalized leadership style.

Events and Activities

The Wentworth Events Board and Center for Student Life team host a robust line-up of events and activities throughout the year. Programs are hosted during the day, at night, and on weekends. The Info Hub, located on the ground floor of Beatty Hall, offers discounted tickets to movies, museums, & special events, equipment loaning, and helpful knowledge about Wentworth and its campus. Email events@wit.edu with ideas or to find out more.

Off-Campus and Commuter Students

The Center for Student Life 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 Campus Police.

Student Transitions

New first-year and transfer students participate in programs designed to facilitate their success at Wentworth through in-person and online New Student Orientation in the summer, Wentworth Opening Week in the fall, and ongoing support throughout the fall semester. Specific programming is offered for transfer students and international students. Senior Week and other programs specifically for graduating students help seniors bring closure to their time at Wentworth and stay connected with their classmates after graduation.

Family Engagement

Family members connect with our community through Family Orientation in the summer before a student's first year at Wentworth and our annual Family Weekend in October. The Center for Student Life aims to connect

with families throughout the year through ongoing programs and newsletters.

Graduate Student Life

Wentworth is committed to support for and building community among our growing graduate student population. The Center for Student Life provides opportunities for graduate students to engage with a Graduate Student Council, programming specifically designed for the graduate student experience that enhance their connection to Wentworth.

Center for Wellness

Maura Mulligan, Associate Dean for Health and Wellness

Williston Hall 2nd Floor
(617) 989-4390

The Center for Wellness provides services to students needing mental health counseling, referrals to off campus providers, education and programs related to health promotion, suicide prevention, fitness and general wellbeing.

Counseling Services

The Center for Wellness is staffed by professionally trained and licensed counselors who are available to provide students with therapy for mental health concerns. Counselors are consulted for many 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 or longer-term counseling needs. All services are free and confidential. No mental health information is released to parents, guardians, or non-counseling staff without the student's written authorization unless required by law or in a life-threatening situation.

In addition to counseling appointments, the Center for Wellness offers walk-in hours each day from 11am to 12 noon and 3pm to 4pm for brief meetings with a counselor. Center staff also assist with mental health emergencies requiring higher levels of care when necessary. A counselor on-call is available 24/7 via phone to assist with these emergencies.

The Center is located on the second floor of Williston Hall and is open Monday through Friday, 8:30 am to 4:30 pm in person with evening hours provided virtually for student convenience. Appointments may be made in person or by calling (617) 989-4390. Questions may be emailed to counseling@wit.edu. Telephonic mental health support is available 24/7 through our *BeWellatWIT* program. To access students may call (617) 989-4390 and select option 2 to speak with a counselor at any time.

Students of Concern

Faculty and staff play an integral role in identifying students who may need a referral to the Center for Wellness. If a faculty or staff member has concerns about a student, they are encouraged to contact the Center for Wellness or file a CARE report. For mental health emergencies faculty and staff should contact Wentworth Public Safety at (617) 989-4444. The Center staff and counselor-on-call work closely with Public Safety in responding to mental health emergencies that may occur.

For more information, please visit our website.

Health Promotion and Education

The Center for Wellness also houses Health Promotion and Education, which supports student success by educating and empowering them to engage in healthy behaviors and decision-making around issues relating to alcohol and other drugs, relationships and sexual health, sleep, stress, nutrition, and fitness. The office is staffed by a full-time assistant director and part-time prevention specialist. Staff members are available to consult with individual students seeking information and advice on a variety of health and wellness topics. Health Promotion and Education can be contacted by phone at (617) 989-4395 or by email at healthpromotion@wit.edu.

Fitness and Wellness Programs

Fitness and Wellness Programs foster and promote a healthy learning environment for students, faculty, and staff by implementing innovative and exciting opportunities that encourage intellectual, physical, social, and spiritual well-being. We strive to provide positive co-curricular activities and experiences designed to enrich lives, develop talents, and offer an arena for discovery and self-exploration. In addition to daily fitness opportunities, experiential well-being programs are offered throughout the year, including both day trips focused on physical activity as well as week-long options for students to engage in physical activity while experiencing new locations.

Recreational Facilities

Fitness facilities include the Schumann Fitness Center located on the ground floor of Beatty Hall, Tansey Weight Room in the Nelson Recreation Center, the Flight Cycle Studio located in Tuxbury Hall, and the Studio at 610 located in the 610 residence hall.

Intramural and Club Sports

Wentworth offers students the opportunity to compete in several intramural 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.

Wentworth offers club sport opportunities for students seeking to engage in competitive sports while at Wentworth, but at the club vs varsity sport level. Students take ownership of helping to organize their club sport teams with the supervision of the coordinator of club sports. Students seeking to learn more about club sports offered should contact fitwell@wit.edu.

Vaccine Compliance

The Center for Wellness oversees student vaccine compliance efforts, including vaccinations required by the state of Massachusetts as well as the COVID-19 vaccine required by Wentworth. Students are required to submit these medical records prior to starting classes on campus. Wentworth partners with CastleBranch so students may create individual accounts and have access to their medical vaccination documents at any time. Students with questions about required vaccines can find information at wit.edu/vaccine or may email immunizations@wit.edu.

Dean of Students

The Dean of Students Office acts as a resource, referral agent, and advocate for students so they may live and learn successfully throughout their Wentworth experience. Whether students need advice or support on academic or personal matters, the Dean of Students Office helps students access resources and solutions. The Dean of Students Office

also serves as a resource for families, community members related to student issues or concerns. The Dean of Students Office is located in Rubenstein 003.

Student Support Services

Recognizing that many students may experience personal challenges and difficulties during their time at Wentworth, students may receive support and advocacy from a member of the Student Support team. Student Support Specialists work with students who are experiencing challenges with college transition, physical or mental health, personal or family difficulties, and/or financial and/or basic needs insecurity. Student Support Specialists also work directly with students who've experienced time away from campus for medical and/or mental health reasons to help facilitate a successful transition back to campus.

CARE Team

The CARE is a campus-wide team of appointed university employees trained to identify, assess, and respond to concerning and/or disruptive behaviors by students, faculty, and staff that may present a risk to the health or safety of the university or its members. The CARE Team is chaired by the Dean of Students. Members of the Wentworth community are encouraged to submit non-emergency referrals via form found at <https://wit.edu/about/reporting>. CARE referrals are not to be used in an emergency. If you have a concern for someone's safety, call Public Safety at 617-989-4444 or 911 immediately.

Student Conduct and Restorative Practices

The Student Code of Conduct contributes to the development of the student and promotion of personal integrity and self-responsibility. Students enrolling at Wentworth become citizens of this community and are entitled to enjoy the privileges and assume the responsibilities associated with the affiliation. As partners in the success of our students, in some cases, families will be notified if their student violates the Student Code of Conduct. The conduct and conflict resolution process provides both formal and informal options for students to resolve conflicts that help them re-engage with their academic and personal lives at Wentworth.

Financial Aid

Anne-Marie Caruso
Associate Vice President
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. The Wentworth priority filing date for new and transfers student varies on the timing of admission's acceptance.

The federal application (FAFSA) is used to determine your eligibility for all need-based financial aid offered by Wentworth. 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 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 President 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 7.54% for 2022-23, with a 4.228% 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 4.99% for undergraduate students and 6.54% for graduate students for 2022-23, with a 1.057% 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.

The Annual Student Loan Acknowledgment

We recommend you complete an Annual Student Loan Acknowledgment each year you accept a new federal student loan. Our goal is to help you understand your loans and how they affect your financial future.

If this is your **first time accepting a federal student loan**, you are acknowledging that you understand your responsibility to repay your loan.

If you have **existing federal student loans**, you are acknowledging that you understand how much you owe and how much more you are eligible to borrow.

You'll also see other federal student aid information, including the interest rates and repayment options to make managing your student loans easier.

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 \$750 to \$6,895 yearly for 2022-23.

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. 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 6206. These may change for the 2021-23 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

President Scholarships for Graduate Students

If you are graduating from Wentworth from an undergraduate day program directly preceding your attendance as a full-time graduate student, under most circumstances the President Scholarship received as an undergraduate will remain during your graduate program. President Scholarships are applied toward tuition charges only.

President Scholarships for Undergraduate Students

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 2.0 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. President Scholarships are applied toward tuition charges only. Therefore, any semester in which tuition charges are covered by another scholarship, third party payment or agency, the President Scholarships will be cancelled for that semester. Visit the website (<https://wit.edu/billing-financial-aid/scholarships/>) at 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.

Donor Funded Scholarships

Additional endowed scholarships are offered at Wentworth through the generosity of donors. Students need to complete the FAFSA form. Students are automatically considered for all scholarships for which they are eligible.

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 Full-time and Part-time*: 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 Full-time and Part-time*: 2.0
Minimum Cumulative Grade Point Average Required For SAP – Graduate: 3.0

*For 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.

Coursework Type	Cumulative GPA	Completion Rate	Maximum Timeframe
Regular courses in a program of study:	Y	Y	Y
Repeat Courses:	Y	Y	Y
Transfer Credits:	N	Y	Y
Consortium Credits:	N (unless grades are noted in the student's transcript)	Y	Y
Incompletes:	N	Y	Y

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 an 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 an 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 they have extenuating circumstances that affected their 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 (provided directly to the student) requesting a reevaluation of the student's aid eligibility. The form 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 they have 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 unit 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 they were 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 withdraw from Wentworth are required to submit a completed the Voluntary Withdrawal Form (<https://wit.edu/ssc/forms/>) to the Registrar (registrar@wit.edu). 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 or 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.

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 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 their 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 from a payment period in which the student began enrollment if the student ceased attendance without completing all the days the student was scheduled to complete in the period

The determination of unofficial withdrawals will occur after grades are posted at the end of each semester. For unofficial withdrawals, the withdrawal date that WIT will use is either the midpoint of the payment

period or the last date of an academically related activity the student participated in.

Programs Offered in Modules

A program is 'offered in modules' if a course or courses do not span the entire length of the payment period. Therefore our 7-week sessions are considered modules. For all programs offered in modules, a student is considered to have withdrawn for Title IV purposes if the student ceases attendance at any point prior to completing the payment period.

Effective May 12, 2021, and in compliance with recent changes to federal regulations (34 CFR 668.22(a)) pertaining to withdrawal exemptions for programs in modules, a student is not considered withdrawn if the student successfully completes:

- *One module that includes 49 percent or more of the number of days in the payment period, excluding scheduled breaks of five or more consecutive days and all days between modules.*
- *A combination of modules that when combined contain 49 percent or more of the number of days in the payment period, excluding scheduled breaks of five or more consecutive days and all days between modules.*
- *Coursework equal to or greater than the coursework required for the institution's definition of a half-time student under Section 668.2 for 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

Optum Student Health Center

Massachusetts College of Art and Design

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. Medical advice is also available to students during nights and weekends when the Optum Health Center is closed by calling (617) 879-5220 and speaking to a medical provider.

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.

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

Housing & Residential Education

Wentworth accommodates more than 2,100 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 for each resident.
- **Evans Way Hall/Tudsbury Hall** is a first-year student residence hall comprised of suites accommodating four (4) to twelve (10) 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. Included in every room is a bed, desk and chair, and closet for each resident.
- **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 bicycle storage room and public meeting rooms. Included in every room is a bed, desk and chair, and closet for each resident.
- **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 for each resident.
- **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 for each resident. 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 for each resident. 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 for each resident.

Each of the residential communities are coeducational and overseen by a building staff, which includes a live-in professional staff member (assistant director, community director, and/or assistant community director) and student community assistants. Building staff are responsible for creating an inclusive, welcoming, educational, and purposeful community focusing 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 live-in professional staff members.

Themed Housing: LEAPs

First-year students are encouraged to participate in a LEAP (Leopards Engaging Among Peers). These thematic living learning communities provide the opportunity to participate in a shared living and

programming experience. The goal of these communities is to assist first-year students in finding a sense of belonging on campus and support their personal, academic, and professional growth. Currently, Housing and Residential Education offers LEAPs with a focus on Women @ WIT, Sports Leadership, Wellness, and Honors.

International Student Services & Engagement

Sarah Sculley, Director
Phone: (617) 989-4680
Younes Majid Alaoui, Advisor
(617) 989-4553

International Student Services & Engagement (ISSE) is part of the Center for Diversity and Global Engagement in the Division of Diversity, Equity & Inclusion.

ISSE staff members are available to assist international students in maintaining their legal F-1 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.

ISSE 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 their F-1 Student status should contact ISSE to obtain an analysis of, and recommendations for, their specific situation. ISSE 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 ISSE in order to provide information to Immigration and Customs Enforcement (ICE) on each student as required by law.

Public Safety

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 plan to become Army officers.

Army Financial Assistance

- 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.
- 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:

Scott T. Lyons
Enrollment and Scholarship Officer
Liberty Battalion Army ROTC: <https://rotc.northeastern.edu>
Northeastern University
(617) 373-2376
sc.lyons@northeastern.edu

Contact at Wentworth:

Michael Siegel, Director of Military-Connected Services (military@wit.edu)

Student Accounts

Heather Clang
Bursar
Williston Hall, Room 101
(617) 989-5043

Tuition, Fees, and Other Expenses

Application Fees

Students in Undergraduate, Masters, and Part Time Evening 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 \$500 enrollment deposit by May 1. Deposits are non-refundable after May 1. New graduate students must pay a non-refundable tuition deposit of \$250 following notification of acceptance.

Housing Down-Payments (Deposits)

New full-time Undergraduate and Masters students entering for the 2023-2024 school year who plan to live in Wentworth housing for the fall and spring semesters must make a \$250 down-payment (deposit). The down-payment is non-refundable and non-transferable. For all other students, deadlines will be published by the Center for Student Life: Residential and Commuter Life. New students starting in the spring who request on-campus housing must also make a \$250 down-payment, which is non-refundable and non-transferable. Down-payments will not be accepted from students who owe a balance for the current or prior semester(s). Students who receive an approved coop position through Coop + Careers that is outside of the Boston area may request a down-payment refund by emailing: housing@wit.edu.

Tuition

At the discretion Wentworth, tuition and fees are subject to change at any time.

- Full-time Undergraduate: Full-time tuition (annual based on two semesters) – \$37,050; per credit \$1,160
- Master of Architecture: Full-time tuition (annual based on two semesters) – \$39,760; per credit \$1,100
- Part-Time Classes - Degree Seeking: per credit \$550
- Master of Civil Engineering: per credit \$1,170
- Master of Project Management: per credit \$1,170
- Master of Business Analytics: per credit \$1,170
- Master of Computer Engineering: per credit \$1,170
- Master of Construction Management: per credit \$1,170
- Master of Data Science: per credit \$1,170
- Master of Electrical Engineering: per credit \$1,170
- Master of Facility Management: per credit \$1,170
- Master of Technology Management: per credit \$1,170
- Master of Engineering in Civil Engineering: per credit \$1,170
- Master of Applied Computer Science: per credit \$1,170
- Certificate Programs – See Center for Continuing Education schedule for current rates

Undergraduate students who take fewer than twelve (12) credits in a semester will be charged per credit rather than the flat full-time rate. Undergraduate students who overload (take more than twenty (20) credits in a semester) will be charged at the per credit rate for each credit over twenty (20). Part-time students who are approved to take a full-time undergraduate course will pay the full-time per-credit rate for that course. Graduate students who take an undergraduate course will pay the graduate per-credit rate for that course.

Technology Fee

A Technology Fee in the amount of \$300 will be charged each semester to all undergraduate students enrolled in more than one course. The Technology Fee supports digital services such as internet access, e-mail, security, help services, software, computer labs, library resources, and wireless networks.

Living Accommodations

Annual Room Rates with \$3,300 Mandatory Board Plan Included

- Baker Hall: Single \$16,790; Double \$15,420; Triple \$14,846
- Evans Way: Single; \$16,790; Double \$15,420; Triple \$14,846
- Tudbury Hall: \$16,790; Double \$15,420; Triple \$14,846

All first-year students are required to purchase a \$3,300 annual board plan regardless of their room assignment.

Annual Room Rates with \$880 Mandatory Board Plan Included

- Louis Prang: Studio Single \$15,340; Single \$15,120; Double \$14,142
- Vancouver: Studio Single \$15,340; Single \$15,120; Double \$14,142
- Edwards/Rodgers: Single \$15,774; Double \$14,538; Triple \$14,024
- 555 Huntington: Single \$15,960; Double \$15,120; Triple \$14,606
- 610 Huntington: Double Double \$15,120; Triple \$14,606
- 525 Huntington: Single \$16,264; Double \$15,326

Any student in Edwards/Rodgers, Vancouver, Louis Prang, 610, 555, and 525 Huntington Avenue may elect to increase their board plan to the following amounts:

- Optional Board Plan A \$3,300 (\$1,650 per semester)
- Optional Board Plan B \$1,720 (\$860 per semester)

Other Expenses

Health Insurance

Massachusetts state law requires all students registered for nine or more credits, including a semester of co-op, to provide proof of health insurance coverage. To comply with this law, students who meet the criteria are assessed a charge for a student health insurance plan. If a student is already covered by an alternate plan that offers comparable coverage and would like to waive the insurance plan, the student must complete a waiver online by the deadline. Student health insurance must be purchased or waived each academic year, typically in the fall semester. Information and deadlines for completing the waiver are published by the Student Accounts Office on the E-Bill and by targeted communications to student's Wentworth email addresses. International students are required to purchase the annual student health insurance plan. International exchange students who attend for one semester must purchase the student health insurance for the semester(s) which they will attend. The standard fee for health insurance for the 2022-2023 academic year is \$2,289.

Parking

- Full-time (Commuter) Pass - Cost per Semester: \$250
- Applicable 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
- Applicable 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
- Applicable Lots and Times: Annex, East (overnight)

Parking permits are issued by the Wentworth Police Department at 610 Huntington Avenue. Wentworth considers parking a privilege, which may be revoked temporarily or permanently, for justifiable reasons by the Wentworth Policy Department. Parking permits shall not be replicated, lent, sold or transferred to another party. Should a vehicle change occur, notify the Wentworth Police Department immediately. Wentworth assumes no liability for lost or stolen property or damage to any vehicle while it is parked on campus in one of our facilities nor does Wentworth assume responsibility or liability for any lost property or damage associated with a vehicle being towed. Hours, rules, and regulations are subject to change without prior notice. A parking permit must always be displayed.

Books, Supplies, and Equipment

Each student provides at their own expense the necessary textbooks, equipment, and instructional supplies. The cost of books and supplies is estimated at \$800 to \$1,500 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 MyWentworth Campus Services tab. Wentworth provided laptop computers are outfitted with the software used in their academic programs. Students must graduate from Wentworth to keep the laptop. Students who withdraw voluntarily or

who are academically withdrawn must return the laptop or be charged the Laptop Recovery Fee to their E-Bill per the Laptop User Agreement.

Sibling Discount

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

- One of the siblings withdraws, or graduates from Wentworth.
- One of the siblings enrolls in a Masters program while the other sibling is enrolled as an undergraduate.

Each sibling must complete the electronic Sibling Discount Application form, located on MyWentworth. Only one application is required for the duration of an undergraduate degree.

Payment Information

Wentworth Institute of Technology partners with a third-party service provider, CASHNet SmartPay, to process all credit and debit card payments to student accounts. Payments can be made online through the student's E-Bill 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). Online payments are the safest and fastest way to pay student account balances by the semester's due dates. Mailed payments should be sent at least fourteen business days prior to the semester's due date to ensure payment is credited by the due date. Wentworth does not accept credit card or debit card payments over the telephone. Bills are presented online and can be accessed through MyWentworth/Leopardweb. Tuition payments for full-time students are due approximately one month prior to the start of each semester. Visit the Student Accounts Office website for published due dates. All students must pay for each semester's classes by the semester's due date.

Alternative Payment Options

Monthly Payment Plan

Wentworth partners with an outside provider, Nelnet Campus Commerce, to offer semester based payment plans. A non refundable enrollment fee of \$60 is charged per semester. Information about our payment plans, including enrollment dates, are available on the Student Accounts Office website (<https://wit.edu/admissions/student-services/billing/payment-plans/>).

FlyWire

International students have the option to send wire payments for tuition and fees using FlyWire, a third party provider who specializes in international student payments. Wire payments over the amount due on the student's account will be returned to the sender via FlyWire.

Delayed VA Payments

Under S2248 PL 115-407 Section 103, Wentworth Institute of Technology will not impose a late payment fee, denial of access to facilities, or other penalty against a veteran or eligible dependent due to a late payment of tuition and/or fees from the VA up to the certified benefits amount. Any portion of the student bill not covered by VA benefits is still expected to be settled by the due date.

Returned Check

A \$30 non refundable fee will be placed on the student's account for any check returned to Wentworth by the bank. Wentworth 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 make payment in full, enroll in a payment plan, submit sponsor documentation and/or be covered by anticipated financial aid funds, or certified alternative loan or Parent PLUS loan funds, on or before the semester's due date (see Payment Information section) may result in a hold and a monthly \$100 late payment fee. Students who have not met their financial obligations to Wentworth will not be allowed to register for additional courses. Students who have campus housing will not be permitted to move into their campus housing assignments, access their grades, transcripts, and diplomas will be withheld from students who have overdue balances. Wentworth reserves the right to hold diplomas, grades, and transcripts from students who have balances due the University. 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 place delinquent unpaid student account balance with an outside collection agency. If an overdue obligation is referred for collection by Wentworth or to an outside agency or attorney for collection efforts and/or legal suit, the debt is increased to cover all reasonable costs of collection, including collection agency fees which may be a percentage of the balance owed at a maximum of 50% of the debt, and all collection costs and expenses, including reasonable attorney fees and court costs that Wentworth may incur in such collection efforts. By registering for any class at Wentworth, the student accepts and agrees to be bound by the foregoing policy as applied to any preexisting or future obligation to Wentworth. Wentworth reserves the right to report to credit bureaus those accounts placed with collection agencies

Credit Balance (Refund) 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. Estimated semester refund dates are published on the Student Accounts Office website. 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 payment method they select for their refund account
- If a credit balance is the result of a Parent PLUS loan, the refund will be issued to the parent borrower unless "refund to the student" is selected by the borrower during the loan application
- If a credit balance is a result of monthly payment plan, the refund will be issued to the plan payer. Any credit balances resulting from a

monthly payment plan will not be refunded until the plan is completed and/or withdrawn

- If a credit balance is a result of a credit card payment, and the payment was made within the past 90 days, the refund will be credited back to the credit card used for the transaction. If the credit card payment was made more than 90 days ago, the refund will be issued to the student based on the payment method they select for their refund account
- If a credit balance is the result of an over payment, and the payment was made by web or paper check, the refund will be issued to the student based on the payment method they select for their refund account, regardless of who the payer is
- If a credit balance is a result of payments made by or loans in the name of parents who are separated or divorced, Wentworth will refund to the student
- Student's whose tuition charge is covered 100% by Chapter 31 veterans benefits may request any federal or state financial aid that has disbursed be refunded to them prior to Wentworth receiving payment from the VA for the semester in session

Any credit on a student's account due to federal financial aid will be refunded back to the appropriate party at the end of the academic year.

Withdrawal from Wentworth

Before withdrawing, it is highly recommended that a student seek counseling from their faculty advisor, or Wellness, if the withdrawal is medical in nature. Students should also consult with the appropriate Financial Aid and Student Account Counselors to discuss any financial consequences of voluntary withdrawal. International students must have their withdrawal form signed by an International Student Services employee or Designated School Official (DSO).

A student who decides to withdraw from Wentworth during the semester should complete a Voluntary Withdrawal Form, located on MyWentworth, and follow the Voluntary Withdrawal procedures outlined in the catalog. Wentworth issued laptop computers must be returned to the DTS Helpdesk, located on the third floor of Beatty Hall. Students who do not return the Wentworth issued laptop will be charged a Laptop Recovery Fee equal to the cost of the computer system as stipulated in the Laptop Program Student Agreement. All students are liable for tuition, room and board, and technology and laptop fees in accordance with the adjustment policy below.

Tuition Adjustments

Tuition adjustment for a withdrawing student is initiated based on the point in the semester at which the student submits the voluntary withdrawal form to the Registrar's Office. 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 attend 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 Registrar's Office receives a completed official withdrawal form, or when the student is reported as administratively withdrawn by a Registrar's Office staff member. Withdrawal forms received after the proration period will not initiate tuition adjustments. Tuition 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%.
- If withdrawal is filed by the end of the fourth week of the semester, tuition reversal amount is 25%.
- If withdrawal is filed by the fifth week of the semester and later, no reversal of tuition charges.

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 their Financial Aid and Student Account Counselors to obtain the appropriate financial aid refund schedule, as well as to discuss any remaining financial obligations. Fees are not refundable once the semester begins. 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 the beginning of week five (5) through the end of the semester, the student will be responsible for the entirety of the board plan charged.

Students who withdraw from Wentworth and want to receive a pro-rated room charge refund must complete and sign the Voluntary Withdrawal Form located on MyWentworth. Students who wish to withdraw from housing but remain enrolled in classes at Wentworth must complete a Housing Cancellation form, located on the Housing and Residential Life website. After the fourth week of classes, no adjustment will be made to a student's room charge if they decide 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 disciplinary sanctions. For more information, please contact the Office of Housing and Residential Life at housing@wit.edu or (617) 989-4160.

Housing Agreement Release Fee

Students who live on campus sign a housing agreement for the duration of their housing assignment period. Students who withdraw from their housing agreement without a valid reason will be responsible for a \$1,000 per semester charge. Students withdrawing from the residence halls after the fourth week of the semester are responsible for the full room and board charge. Please see the policies section on Wentworth Residential and Commuter Life's website (wit.edu/student-life) for more information.

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 above-mentioned refund policy.

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 PLUS Loan,
4. Federal Pell Grant,
5. Federal Supplemental Educational Opportunity Grant,
6. State funded Grants,
7. Private funded programs, and
8. Wentworth Institutional Aid

Specific questions regarding the refund policy can be addressed with a student's Financial Aid or Student Account Counselor. 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 academic units have developed study abroad programs such student exchange programs and faculty-led programs with other institutions. In past years, students have studied in Germany, France, England, Turkey, 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 courses taken during a study abroad semester require pre-approval and are submitted to the Registrar (registrar@wit.edu) on a completed Transfer Credit Pre-approval form (<http://www.wit.edu/ssc/forms/>). Students must meet with an associate dean of their school to determine if the available courses will satisfy requirements within their major. In many cases an established course equivalency list is available. Courses

completed that have not been pre-approved will not become part of the student's WIT academic record. 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 an active 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 school and program as well as 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.

THE SCHOOL OF ARCHITECTURE AND DESIGN

Sedef Doganer, Dean

Annex North 105

(617) -989-5019

Kelly Hutzell, Associate Dean

Annex North 104

(617) -989-4954

Mark Mulligan, Associate Dean

Annex North 109

(617) -989-4935

Jason Rebillot, Director of Graduate Programs

Annex North 106

(617) -989-4845

Vision

We aim to promote an interdisciplinary culture of design and research engaged with environmental, and societal challenges. Together we thrive as advocates and creative design leaders who serve local and global communities to improve the world through design innovation.

Mission

We empower design students and educators from all backgrounds to become creative, civic-minded problem-solvers, responding to global challenges and contributing to local communities. Our graduates are equipped with the skills, knowledge, and immersive experiences to shape the future of design.

Education Model

The School of Architecture & Design provides a holistic learning experience by using an experiential learning model for student success. The School offers hands-on learning opportunities through class projects in the studio and lab. During co-op semesters, students apply what they have learned at school to real-world projects and sharpen their professional knowledge and skills. The School is committed to educating students to be creative and innovative problem solvers and design thinkers.

Laboratory Experience

Students in the School of Architecture & Design learn by doing. The School has dedicated studio spaces that support interactions with student peers and faculty, helping to build a strongly bonded and collaborative design community. The Center for Applied Research (CfAR) and Industrial Design Labs offer students access to equipment and services for fabricating prototypes and models. These labs are equipped with various up-to-date machines and technology.

Global Impact

The School of Architecture & Design leads the effort to connect regional expertise with global partners through educational and engagement programs that support degree-specific learning and research goals.

Architecture

Professor

- Ann Borst, M.Arch.
- Manuel E. Delgado, M.S.
- Sedef Doganer, Ph.D.
- John Ellis, M.Des.
- Garrick Goldenberg, M.S.
- Mark A. Klopfer, M.L.A.
- Mark Mulligan, M.Arch.
- Mark E. Pasnik, M.Des.
- Anne-Catrin Schultz, Ph.D.

Associate Professor

- Carol Burns, M.Arch.
- Robert Cowherd, Ph.D.
- Antonio Furgiuele, M.S.
- Lora Kim, M.Arch.
- Jennifer Lee Michaliszyn, M.Arch.
- Troy Peters, Ph.D.
- Anthony Piermarini, M.Arch.
- Ann W. Pitt, M.Arch.
- Jason Rebillot, D.Des.
- Robert Trumbour, M.F.A.

Assistant Professor

- Meliti Dikeos, M.Arch.
- Ingrid Strong, M.Arch.

Visiting Associate Professor

- Ignacio Cardona, M.S.

Visiting Assistant Professor

- Yassaman Esmaili, M.S.
- Benjamin Hait, M.Arch.
- Sergio Melgar, Ph.D.
- NJ Unaka, Ph.D.

Architecture Bachelor of Science

Leading to a 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 architectural design across a broad range of scales. Associated courses in visual representation, history, theory, technology, and professional practice inform and enrich students' responses to studio challenges. Student learning is enhanced by two semesters of cooperative work experience as well as study abroad options.

Program Educational Objectives

The undergraduate architecture curriculum is framed within a liberal arts course of study and leads to a pre-professional degree. While

completing a structured sequence of required and elective courses in architecture and other subject areas, students learn to think holistically, drawing connections between different areas of knowledge. Upper-level courses are focused on developing critical skills necessary for understanding architecture within a global cultural context; students gain experience 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 Bachelor of Science program allows students at Wentworth to apply to the one-year Master of Architecture program.

Student Outcomes

The Bachelor of Science in Architecture program emphasizes the tangible, material, and cultural dimensions of the discipline, exploring a range of 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 and identify social and spatial patterns that characterize different cultures and individuals;
- Respond appropriately to site conditions; develop a program of functional uses; interpret building codes and apply principles of life-safety and accessibility;
- Employ knowledge of basic structural behavior and apply appropriate structural systems to design solutions;
- Select, develop, and integrate climate control and other building systems, both passive and active, as appropriate to a chosen site and a program, prioritizing sustainability and minimizing negative impacts on the environment;
- Make integrated design decisions, relying on critical assessment and evaluation, in order to synthesize environmental, technical, accessibility, structural, and material issues;
- Interpret professional issues through 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.

Urbanism

This concentration explores architecture's capacity for engaging urban systems and landscapes in the Anthropocene, economics and social justice, and the larger forces of history and culture operating on and through the built environment. It challenges students to explore the interplay between complex social, cultural, and ecological systems as a form of design research and empowers young professionals to collaborate across disciplinary boundaries and provide leadership in reshaping our cities.

Emerging Technologies

This concentration builds knowledge and skills in the technologies that are transforming the discipline and profession of architecture. It explores emergent design techniques, materials, construction methods, digital fabrication, computational software, and media of architecture. It offers students an understanding of the principles and applications of technologies that are central to shaping architectural modernity and the future of the built environment.

Adaptive Interventions

This concentration investigates architecture as it relates to design interventions, adaptations, and transformations of existing conditions, communities, and contexts. It explores how built architectural works engage complex social, political, economic, environmental, historical, and disciplinary forces—and how to re-engage those changing forces when adapting or intervening in an existing setting. If the most sustainable building is one that already exists, this concentration establishes strategies for capitalizing on our built fabric while imagining inventive ways to transform buildings and urban environments from past generations.

Study Abroad

The School of Architecture and Design has a long tradition of offering semester-long study-abroad programs for undergraduates in international locations of architectural and urbanistic significance. The programs are led by Wentworth faculty members in collaboration with architects and scholars residing in those cities. During their time abroad, students enrich their cultural and professional perspectives through study-travel and working closely with local design professionals. Study-abroad curriculum is aligned with required courses in Boston, allowing normal progress toward graduation. During academic year 2022-23, semester-abroad programs will be offered in Urbino, Italy and Girona, Spain.

Cooperative Work Experience

The undergraduate Architecture program 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 program collaborates with the Institute's Center for Cooperative Education and Career Development to reinforce the learning content of these placements. 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. Work experience during cooperative education semesters may be documented and applied toward future professional licensure through the Architectural Experience Program (AXP), administered by the National Council of Architectural Registration Boards (NCARB).

Admission to the M.Arch Program from the Wentworth B.S. Arch Program

Wentworth undergraduates in the B.S. Arch program may apply to the M.Arch program in their senior year; acceptance is based on a faculty committee evaluation of the applicant's undergraduate transcript, portfolio, statement of objectives, and references. Undergraduate architecture majors who have achieved an overall GPA of 3.0 or higher through junior year will be accepted automatically into the M.Arch program for the following year's application cycle; these students only need to submit an application form, a resume, and a statement of objectives. Automatic acceptance applies *only* to applicants currently enrolled in Wentworth's B.S. Arch 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), which is 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. A program may be granted an eight-year term, an eight-year term with conditions, or a two-year term of continuing accreditation, or a three-year term of initial accreditation, depending on the extent of its conformance with established educational standards. Doctor of Architecture and Master of Architecture degree programs may require a non-accredited undergraduate degree in architecture for admission. However, the non-accredited degree is not, by itself, recognized as an accredited degree.

Wentworth Institute of Technology's School of Architecture and Design offers the following NAAB-accredited degree programs:

- 1 Yr M.Arch (Wentworth B.S. Arch + 34 credits)
- 2 Yr M.Arch (pre-professional bachelor's degree in architecture + 70 credits)
- 3 Yr M.Arch (bachelor's degree in a field other than architecture + 106 credits)

The next accreditation visit for all programs is spring 2026.

B.S. Architecture Degree Details

Total Credits for degree: 136

The Bachelor of Science in Architecture is a four-year program that begins in the fall of the student's first year and is intended to be completed in the spring semester of the fourth year.

In the junior year, students select one of three concentrations – Urbanism, Emerging Technologies, or Adaptive Interventions – as the focus of their advanced coursework during junior and senior years.

Special Grade Requirement

The Architecture academic unit 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 year, students get a broad introduction to the field of architectural design, which serves as the foundation for the curriculum. In the following three semesters, students gain knowledge in integrative design, with sequenced courses in construction technology, environmental systems, structures, history and theory supporting design studios of increasing complexity.

Course	Title	Credits
Freshman Year		
Fall Semester		
ARCH1000	STUDIO 01	6
ARCH1200	ARCHITECTURAL REPRESENTATION	4
MATH1000	COLLEGE MATHEMATICS	4
MATH1500, MATH1700, MATH1750, MATH1800 or MATH1850 will satisfy the MATH Requirement		
English Sequence		4
	Credits	18
Spring Semester		
ARCH1500	STUDIO 02	6
ARCH1700	ARCHITECTURAL MEDIA	4
English Sequence		4
PHYS1000	COLLEGE PHYSICS I	4
PHYS1250 will satisfy PHYS requirement		
	Credits	18
Sophomore Year		
Fall Semester		
ARCH2000	STUDIO 03	6
ARCH2100	HISTORY/THEORY 01	4
ARCH2200	BUILDING MATTERS: MATERIALS & ELEMENTS OF CONSTRUCTION	4
HSS Elective		4
	Credits	18
Spring Semester		
ARCH2500	STUDIO 04	6
ARCH2600	HISTORY/THEORY 02	4
ARCH2700	ENERGY & RESOURCES IN ARCHITECTURE	4
ARCH3400	STRUCTURES 01	4
ARCH2225	PRO-PRACTICE PREP	0
	Credits	18
Summer Semester		
COOP3500	COOP EDUCATION 1	
	Credits	0
Junior Year		
Fall Semester		
ARCH3000	STUDIO 05	6
ARCH3900	STRUCTURES 02	4
HSS Elective		4
General Elective		4
	Credits	18
Spring Semester		
COOP4500	COOP EDUCATION 2	0
	Credits	0
	Total Credits	90

Concentrations

In the fall of junior year, students choose one of three concentrations. In the following summer semester, juniors take their first concentration seminar, which surveys the history and theory of their chosen concentration. This seminar is followed in senior year by a second concentration seminar and a concentration-specific studio (Studio 07).

Urbanism Concentration		Credits	Course	Title	Credits
Course	Title				
Junior Year					
Summer Semester					
ARCH3500	STUDIO 06	6	ARCH3750	CONCENTRATION STUDIES 02	4
ARCH3200	PASSIVE & ACTIVE SYSTEMS	4	ARCH4050	STUDIO 07 (ADAPTIVE INTERVENTIONS)	6
ARCH3700	CONCENTRATION STUDIES 01	4	HSS Elective		4
HSS Elective		4			
	Credits	18			
Senior Year					
Fall Semester					
ARCH4000	STUDIO 07 (URBANISM)	6	ARCH5500	STUDIO 08	6
ARCH3750	CONCENTRATION STUDIES 02	4	Architecture Elective (p. 70)		4
HSS Elective		4	HSS Elective		4
	Credits	14			
Spring Semester					
ARCH5500	STUDIO 08	6		Credits	14
Architecture Elective (p. 70)		4			
HSS Elective		4		Total Credits	46
	Credits	14			
	Total Credits	46			
Emerging Technologies Concentration					
Course	Title	Credits	Course	Title	Credits
Junior Year			ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Design Strategies for Low-Carbon Buildings)	4
Summer Semester			ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Geospatial Modeling)	4
ARCH3500	STUDIO 06	6	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Holistic Sustainable Design Integration)	4
ARCH3200	PASSIVE & ACTIVE SYSTEMS	4	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Animated Architectural Volumes)	4
ARCH3700	CONCENTRATION STUDIES 01	4	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Potentials of Additive Manufacturing)	4
HSS Elective		4	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Architects, Directors, Scenographers)	4
	Credits	18	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Collage in Architecture)	4
Senior Year			ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Green & Resilient Design)	4
Fall Semester			ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Color Relationships)	4
ARCH4025	STUDIO 07 (EMERGING TECHNOLOGIES)	6	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Modernism Beyond the West)	4
ARCH3750	CONCENTRATION STUDIES 02	4	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Material Intelligence)	4
HSS Elective		4	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Issues in Professional Practice)	4
	Credits	14	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Context Analysis-Berlin)	4
	Total Credits	46	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Space & Media)	4
Adaptive Interventions Concentration			ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (City of the Future)	4
Course	Title	Credits	ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Building Community)	4
Junior Year			ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Project Planning)	4
Summer Semester					
ARCH3500	STUDIO 06	6			
ARCH3700	CONCENTRATION STUDIES 01	4			
HSS Elective		4			
ARCH3200	PASSIVE & ACTIVE SYSTEMS	4			
	Credits	18			

Course	Title	Credits	
ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Framing Chinese Architecture)	4	<ul style="list-style-type: none"> • 1 Yr M.Arch (Wentworth B.S. Arch + 34 credits) • 2 Yr M.Arch (pre-professional bachelor's degree in architecture + 70 credits) • 3 Yr M.Arch (bachelor's degree in a field other than architecture + 106 credits)
ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Multi(ply))	4	
ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Fundamentals of Design Finance)	4	
ARCH3800	SPECIAL TOPICS IN ARCHITECTURE (Explorations in the Making)	4	

ENGL/HSS Note**Students are required to complete:**

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences; HSSI, COMM, ECON, POLS, PSYC, and SOCL
- The remaining course 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.

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 become leaders in a rapidly evolving profession.

Architectural Accreditation

In 2018 Wentworth Institute of Technology was granted an eight-year term of accreditation (the maximum possible under the *2014 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), which is 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. A program may be granted an eight-year term, an eight-year term with conditions, or a two-year term of continuing accreditation, or a three-year term of initial accreditation, depending on the extent of its conformance with established education standards. Doctor of Architecture and Master of Architecture degree programs may require a non-accredited undergraduate degree in architecture for admission. However, the non-accredited degree is not, by itself, recognized as an accredited degree.

Wentworth Institute of Technology's School of Architecture and Design offers the following NAAB-accredited degree programs as a one-, two-, or three-year sequence of study:

- 1 Yr M.Arch (Wentworth B.S. Arch + 34 credits)
- 2 Yr M.Arch (pre-professional bachelor's degree in architecture + 70 credits)
- 3 Yr M.Arch (bachelor's degree in a field other than architecture + 106 credits)

The next accreditation visit for all programs is spring 2026.

Student Outcomes

The M.Arch program emphasizes the tangible, material, and cultural dimensions of the discipline, exploring a range of 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.

Global Research Studios

The Global Research Studios, offered in the fall semester of the culminating year of the M.Arch program, address research topics and sites from a global perspective. Students frame a design issue within a faculty-directed research agenda. During a ten-day travel period, students conduct site research and engage with on-site organizations and/or communities. Upon their return to campus, students generate design criteria and conduct design tests through an iterative process. In the recent past, Global Research Studios have traveled internationally to Spain, Morocco, Greece, Italy, Finland, Scotland, Iceland, France, China, Benin, and Mexico, as well as domestically in New England and across the United States.

Thesis Program

The eight-month thesis program begins in the fall semester of the culminating year with two foundational courses. The Methods and Design as Research 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. 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.

Master of Architecture Program Tracks

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

- The one-year Master of Architecture professional degree for students who earned their Bachelor of Science degree in architecture from Wentworth (internal candidates).
- The two-year Master of Architecture professional degree for external candidates who have completed a non-accredited *Bachelor of Arts* or *Bachelor of Science* degree in architecture from another institution.

Wentworth students earning a Bachelor of Science in Interior Design are also eligible to apply for the two-year M.Arch program.

- The three-year Master of Architecture professional degree for external candidates who have completed a Bachelor of Arts or Bachelor of Science in an unrelated discipline.

Information about admission to the three M.Arch program tracks is found in the Academic Catalog under "Admissions - Graduate Programs."

Cooperative Education Work Experience

M.Arch students in the two- and three-year tracks are required to spend one semester working in an architectural or allied professional office in the summer term preceding their final year of study. The graduate program collaborates with Wentworth's Co-ops + Careers Office to reinforce the learning content of these placements.

Integrated Path to Architectural Licensure (IPAL)

Wentworth offers the Integrated Path to Architectural Licensure (IPAL), an optional path launched by the National Council of Architectural Registration Board (NCARB) for motivated students seeking to become architects. By selecting the IPAL option, students in the process of earning a degree from a NAAB-accredited program can complete the Architectural Experience Program (AXP) and the Architect Registration Examination (ARE) concurrently. Undergraduate students enrolled in the IPAL program who are then accepted in Wentworth's one-year M.Arch program will complete the one-year M.Arch curriculum over the course of two years, as part-time students working part-time in the profession.

Total credits for degree: 34 (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)

Course	Title	Credits
First Year		
Fall Semester		
ARCH9000	GLOBAL RESEARCH STUDIO	6
ARCH9200	METHODS OF HISTORY, THEORY & CRITICISM	4
ARCH9300	DESIGN AS RESEARCH	4
Architecture Elective		3-4
Credits		17-18
Spring Semester		
ARCH9500	THESIS STUDIO	6
ARCH9600	PROFESSIONAL PERSPECTIVES	4
ARCH9700	ADVANCED TOPICS IN CONTEMPORARY ARCHITECTURE	4
Architecture Elective		3-4
Credits		17-18
Total Credits		70-72

Master of Architecture (Two-Year)

Course	Title	Credits
First Year		
Fall Semester		
ARCH8000	ADVANCED GRADUATE DESIGN STUDIO 01	6
ARCH8250	PASSIVE AND ACTIVE SYSTEMS	4
ARCH8300	APPLIED RESEARCH & DESIGN 01	4
ARCH8400	STRUCTURES 01	4
Credits		18
Spring Semester		
ARCH8500	ADVANCED GRADUATE DESIGN STUDIO 02	6
ARCH8700	APPLIED RESEARCH & DESIGN 02	4
ARCH8800	STRUCTURES 02	4
Architecture Elective		4
Credits		18
Summer Semester		
COOP6500	GRADUATE COOP EDUCATION	0
Credits		0
Second Year		
Fall Semester		
ARCH9000	GLOBAL RESEARCH STUDIO	6
ARCH9200	METHODS OF HISTORY, THEORY & CRITICISM	4
ARCH9300	DESIGN AS RESEARCH	4
Architecture Elective		3-4
Credits		17-18
Spring Semester		
ARCH9500	THESIS STUDIO	6
ARCH9600	PROFESSIONAL PERSPECTIVES	4
ARCH9700	ADVANCED TOPICS IN CONTEMPORARY ARCHITECTURE	4
Architecture Elective		3-4
Credits		17-18
Total Credits		70-72
Master of Architecture (Three-Year)		
Course	Title	Credits
First Year		
Fall Semester		
ARCH7000	GRADUATE FOUNDATION STUDIO 01	6
ARCH7250	GRADUATE HISTORY THEORY LECTURE	4
ARCH7300	BUILDING MATTERS	4
ARCH7350	2D + 3D MEDIA & PROCESSES	4
Credits		18
Spring Semester		
ARCH7500	GRADUATE FOUNDATIONS STUDIO 02	6
ARCH7550	GRADUATE HISTORY THEORY SEMINAR	4
ARCH7600	ENERGY AND RESOURCES IN ARCHITECTURE	4
Architecture Elective		4
Credits		18

Course	Title	Credits
Second Year		
Fall Semester		
ARCH8000	ADVANCED GRADUATE DESIGN STUDIO 01	6
ARCH8250	PASSIVE AND ACTIVE SYSTEMS	4
ARCH8300	APPLIED RESEARCH & DESIGN 01	4
ARCH8400	STRUCTURES 01	4
	Credits	18
Spring Semester		
ARCH8500	ADVANCED GRADUATE DESIGN STUDIO 02	6
ARCH8700	APPLIED RESEARCH & DESIGN 02	4
ARCH8800	STRUCTURES 02	4
Architecture Elective		4
	Credits	18
Summer Semester		
COOP6500	GRADUATE COOP EDUCATION	0
	Credits	0
Third Year		
Fall Semester		
ARCH9000	GLOBAL RESEARCH STUDIO	6
ARCH9200	METHODS OF HISTORY, THEORY & CRITICISM	4
ARCH9300	DESIGN AS RESEARCH	4
Architecture Elective		3-4
	Credits	17-18
Spring Semester		
ARCH9500	THESIS STUDIO	6
ARCH9600	PROFESSIONAL PERSPECTIVES	4
ARCH9700	ADVANCED TOPICS IN CONTEMPORARY ARCHITECTURE	4
Architecture Elective		3-4
	Credits	17-18
	Total Credits	106-108

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.

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.

Architectural Studies Minor Industrial Design

Professor

- Simon R. Williamson, M.Des.

Associate Professor

- Jeffrey A. Michael, M.F.A.
- Sam Montague, M.F.A.
- Carlos Villamil, M.L.A.

Assistant Professor

- Liza Lynch, M.F.A.

Visiting Assistant Professor

- Sam Maddox, M.Des.
- Matthew O'Connor, M.S.

- **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.

Special Grade Requirement

The Industrial Design academic unit has a special grade requirement that applies to all design studio courses from the sophomore year onward:

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.

Course	Title	Credits
Freshman Year		
Fall Semester		
DSGN1000	VISUALIZATION I/DRAWING I	3
DSGN1100	DESIGN MAGIC	2
INDS1000	INDUSTRIAL DESIGN STUDIO 1	4
INDS1750	VISUAL COMMUNICATION	4
English Sequence		4
	Credits	17
Spring Semester		
DSGN1200	COLOR & COMPOSITION	4
INDS1500	INDUSTRIAL DESIGN STUDIO 2	4
INDS1850	VISUALIZATION 2: ADVANCED PERSPECTIVE	3
MATH1020	PLANE & SOLID GEOMETRY	4
English Sequence		4
	Credits	19
Sophomore Year		
Fall Semester		
INDS2000	INDUSTRIAL DESIGN STUDIO 3	4
INDS2350	VISUALIZATION 3: DRAW & THINK	3
INDS2600	CAD 1: SURFACE MODELING	3
PHYS1010	CONCEPTUAL PHYSICS	4
HSS Elective		4
	Credits	18
Spring Semester		
INDS2300	3D REALIZATION I	4
INDS2500	INDUSTRIAL DESIGN STUDIO 4	4
INDS2850	VISUALIZATION 4: PRESENTATION & ILLUSTRATION	3
INDS3100	CAD 2: SOLID MODELING	3
HSS Elective		4
	Credits	18
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	
	Credits	0
Junior Year		
Fall Semester		
INDS2800	3D REALIZATION 2	4
INDS3000	INDUSTRIAL DESIGN STUDIO 5	4
INDS3200	HUMAN FACTORS IN DESIGN	3
INDS3300	INFORMATION ARCHITECTURE 1	3
HSS Elective		4
	Credits	18
Spring Semester		
COOP3500	COOP EDUCATION 1	
	Credits	0
Summer Semester		
INDS3500	INDUSTRIAL DESIGN STUDIO 6	4
INDS3600	MANUFACTURING IN DESIGN	3

Course	Title	Credits
HSS Elective		4
Technical Elective		3
	Credits	14
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	
	Credits	0
Spring Semester		
INDS4000	INDUSTRIAL DESIGN STUDIO 7	4
INDS4011	DESIGN PERSPECTIVES: TOPICS IN HISTORY	4
INDS4300	INFORMATION ARCHITECTURE 2	3
INDS5000	RESEARCH: SENIOR STUDIES	3
HSS Elective		4
	Credits	18
Summer Semester		
INDS4500	BUSINESS IN DESIGN	3
INDS4750	SENIOR SEMINAR	3
INDS5500	SENIOR STUDIES	4
HSS Elective		4
	Credits	14
	Total Credits	136

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences; HSSI, COMM, ECON, POLS, PSYC, and SOCL
- The remaining course 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

Professor

- Seunghae Lee, Ph.D.

Associate Professor

- Robert Meszaros, M.F.A.
- Lynette Panarelli, M.I.D.

Assistant Professor

- Sylvia DeLuca, M.S.
- Jordana Psiloyenis, M.S.

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 be eligible to sit for one section of the three NCIDQ examination sections 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: 131

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, INTD3010 INTERIOR STUDIO V, INTD3510 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.

Course	Title	Credits	Course	Title	Credits			
Freshman Year								
Fall Semester								
DSGN1000	VISUALIZATION I/DRAWING I	3	INTD3510	INTERIOR STUDIO VI	4			
DSGN1100	DESIGN MAGIC	2	INTD3600	LIGHTING	3			
INTD1000	INTERIOR STUDIO I	4	Design Elective		3			
MATH1000	COLLEGE MATHEMATICS	4	HSS Elective		4			
English Sequence		4						
	Credits	17		Credits	14			
Spring Semester								
DSGN1200	COLOR & COMPOSITION	4	INTD4010	INTERIOR STUDIO VII	4			
INTD1500	INTERIOR STUDIO II	4	INTD4100	BUILDING REGULATIONS	3			
INTD1600	HISTORY OF INTERIORS	3	INTD5000	SENIOR PROJECT: RESEARCH	3			
INTD1750	DRAWING II	3	HSS Elective		4			
English Sequence		4		Credits	14			
	Credits	18	Summer Semester					
Sophomore Year			INTD4600	PROFESSIONAL PRACTICE	3			
Fall Semester			INTD5500	SENIOR PROJECT: DESIGN	6			
INTD2000	INTERIOR STUDIO III	4	HSS Elective		4			
INTD2100	MATERIALS	3		Credits	131			
INTD2250	DRAWING III	4		Total Credits	131			
PHYS1000	COLLEGE PHYSICS I	4	ENGL/HSS Note					
HSS Elective		4	Students are required to complete:					
	Credits	19	<ul style="list-style-type: none"> At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC, and SOCL The remaining course from either the Humanities or Social Sciences category. 					
Spring Semester								
INTD2500	INTERIOR STUDIO IV	4	Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.					
INTD2600	HISTORY OF INTERIORS II	3	A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.					
INTD2700	BUILDING SYSTEMS I	3	For BINT students, two English courses (8 credits) and six HSS courses (24 credits) are required to complete. Of the six HSS requirements, BINT students must complete the following:					
INTD2800	PRESENTATION TECHNIQUES	4	<ul style="list-style-type: none"> An Art History Elective (choose one of the courses below) <ul style="list-style-type: none"> HUMN4243 CONTEMPORARY ART & THEORY HUMN4260 MODERNISM IN THE ARTS HUMN4263 ART & SOCIETY IN THE INDUSTRIAL AGE HUMN4275 MYTH AMERICA: FROM COLONIES TO CULTURE WARS HUMN4343 RENAISSANCE TO ROMANTICISM A PSYC/SOCL Elective (choose one of the courses with PSYC or SOCL prefixes) 					
HSS Elective		4						
	Credits	18						
Junior Year								
Fall Semester								
INTD3010	INTERIOR STUDIO V	4						
INTD3100	CONSTRUCTION DOCUMENTS	4						
INTD3300	BEHAVIORAL ASPECTS OF DESIGN	3						
INTD3400	BUILDING SYSTEMS & INTERIOR SPECIFICATION	3						
HSS Elective		4						
	Credits	18						
Spring Semester								
COOP3500	COOP EDUCATION 1	0						
	Credits	0						

THE SCHOOL OF COMPUTING AND DATA SCIENCE

Durga Suresh-Menon, Dean

Dobbs Hall Room 142

(617) 989-4833

Raymond Hansen, Associate Dean

Dobbs Hall Room 140

(617) 989-4762

En-Bing Lin, Associate Dean

Dobbs Hall Room

(617) 989-

Vision

Our graduates will solve challenging problems facing enterprises, industries, and societies; adapt to ever-changing technologies; promote diversity and inclusivity; while being responsible and enlightened citizens of an interconnected world.

Mission

The School of Computing and Data Science prepares graduates for productive and impactful careers in a variety of disciplines through exceptional instruction, applicable experiential learning and industry-focused co-operative educational experiences.

Applied Mathematics

Professor

- En-Bing Lin, Ph.D.

Associate Professor

- Robert C. Cournoyer, M.S.
- Gabe Cunningham, Ph.D.
- Melvin Henriksen, M.S.
- Dwight F. Horan, M.Ed.
- Mark Mixer, Ph.D.
- Steven Morrow, Ph.D.
- Youssef Qranfal, Ph.D.
- Mami Wentworth, Ph.D.

Assistant Professor

- Sougata Dhar, Ph.D.
- Semere Gebresilasie, Ph.D.
- Barry Husowitz, Ph.D.
- Rachel Maitra, Ph.D.
- Lauren Melfi, Ph.D.
- Igor Minevich, Ph.D.

Visiting Assistant Professor

- Mitra Bahary, Ph.D.
- Sharon DeCicco, M.S.

- Chris McDonald, M.S.
- Yu Zhang, M.S.

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. The four-year B.S. in Applied Mathematics in which majors take 8 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.

Program Educational Outcomes

- 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	Credits
First Year		
Fall Semester		
MATH1550	FOUNDATIONS OF APPLIED MATHEMATICS	4
MATH1776	ACTIVE CALCULUS 1A	2
MATH1777	ACTIVE CALCULUS 1B	2
COMP1000	COMPUTER SCIENCE I	4
English Sequence		
Science Elective		
	BIOL1100, BIOL1700, BIOL2200, BIOL3000, CHEM1100, CHEM1600, PHYS1250, PHYS1750, PYHS2000 will satisfy the SCIENCE elective requirement.	4
	BIOL2990, CHEM2990, PHYS2990, BIOL3800, CHEM3800 and PHYS3800 require School approval	4
Credits		
Spring Semester		
MATH1876	ACTIVE CALCULUS 2A	2
MATH1877	ACTIVE CALCULUS 2B	2
MATH2300	DISCRETE MATHEMATICS	4
COMP1050	COMPUTER SCIENCE II	4
English Sequence		
4		

Course	Title	Credits
Science Elective		4
	BIOL1100, BIOL1700, BIOL2200, BIOL3000, CHEM1100, CHEM1600 PHYS1250 will satisfy the SCIENCE elective requirement. BIOL2990, CHEM2990, PHYS2990, BIOL3800, CHEM3800 and PHYS3800 require School approval	
	Credits	20
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0
	Credits	0
Second Year		
Fall Semester		
MATH2025	MULTIVARIABLE CALCULUS	4
MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4
MATH2550	TRANSITION TO ADVANCED MATH	4
MATH3900	NUMERICAL ANALYSIS I	4
HSS Elective*		4
	Credits	20
Spring Semester		
MATH2200	ADVANCED STATISTICS	4
MATH2500	DIFFERENTIAL EQUATIONS	4
MATH2860	LINEAR ALGEBRA & MATRIX THEORY	4
MATH3950	NUMERICAL ANALYSIS II	4
NON-TECH Non-Technical Elective		4
	Credits	20
Summer Semester		
COOP3500	COOP EDUCATION 1	
	Credits	0
Third Year		
Fall Semester		
MATH3700	OPERATIONS RESEARCH	4
MATH4900	PARTIAL DIFFERENTIAL EQUATIONS	4
Technical Elective (p.)		4
Technical Elective (p.)		4
HSS Elective*		4
	Credits	20
Spring Semester		
COOP4500	COOP EDUCATION 2	0
	Credits	0
Summer Semester		
MATH5000	APPLIED MATHEMATICS FINAL YEAR DESIGN I	4
Technical Elective (p.)		4
Technical Elective (p.)		4
HSS Elective*		4
NON-TECH - Non-Technical Elective		4
	Credits	20
	Total Credits	120

- One public lecture
- A website
- A poster presentation

Non-Technical Electives:

A total of 8 semester credit hours comprised of any two 4-credit courses for which the pre-requisite has been met, in the following subjects: ARCH, COMM, CONN, ECON, ENGL, HIST, HUMN, HSSI, INDS, INTD, LITR, MGMT, MANF, PHIL, POLS, PSYC, SOCL, SURV

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL
- The remaining course 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 20 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 16 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 Academic Unit including:

Course	Title	Credits
MATH1950	FINANCIAL MATHEMATICS	4
MATH2250	TIME SERIES	4
MATH2425	CRYPTOLOGY	4
MATH3150	STOCHASTIC PROCESSES	4
MATH3200	DIFFERENTIAL GEOMETRY	4
MATH3225	FUNCTIONAL ANALYSIS	4
MATH3250	HAZARD & CATASTROPHE MODELING	4
MATH3500	CALCULUS IV	4
MATH4050	MACHINE LEARNING	4
MATH4100	INDUSTRIAL PROBLEMS IN APPLIED MATHEMATICS	4
MATH4400	INTRODUCTION TO ABSTRACT ALGEBRA	4
MATH4475	ACTUARIAL MATHEMATICS	4
MATH4575	COMPLEX VARIABLES	4
MATH4875	REAL ANALYSIS I	4
MATH4975	REAL ANALYSIS II	4
MGMT2750	INTEGRATIVE FINANCIAL ACCOUNTING (requires School approval)	4

Non-coursework Requirement:

In addition to the above coursework requirements, students are required to complete the following non-coursework degree requirements:

Course **Title** **Credits**

Any 2000-Level courses in BIOE,BIOL,
BMED,CHEM,CIVE,COMP,ELEC,ELMC,ENGR,ENVM,MECH,PHYS,SCIN
will also count as Technical Electives* Prerequisites must be met
and School approval is required.

Four Year Program

Total Required Credits: 120

Course	Title	Credits
First Year		
Fall Semester		
MATH1550	FOUNDATIONS OF APPLIED MATHEMATICS	4
MATH1776	ACTIVE CALCULUS 1A	2
MATH1777	ACTIVE CALCULUS 1B	2
English Sequence		4
Science Elective		4
BIOL1100, BIOL1700, BIOL2200, BIOL3000, CHEM1100, CHEM1600, PHYS1250 will satisfy the SCIENCE elective requirement. BIOL2990, CHEM2990, PHYS2990, BIOL3800, CHEM3800 and PHYS3800 require School approval		
	Credits	16
Spring Semester		
MATH1876	ACTIVE CALCULUS 2A	2
MATH1877	ACTIVE CALCULUS 2B	2
MATH2300	DISCRETE MATHEMATICS	4
English Sequence		4
Science Elective		4
BIOL1100, BIOL1700, BIOL2200, BIOL3000, CHEM1100, CHEM1600 PHYS1250 will satisfy the SCIENCE elective requirement. BIOL2990, CHEM2990, PHYS2990, BIOL3800, CHEM3800 and PHYS3800 require School approval		
	Credits	16
Second Year		
Fall Semester		
MATH2025	MULTIVARIABLE CALCULUS	4
MATH2550	TRANSITION TO ADVANCED MATH	4
COMP1000	COMPUTER SCIENCE I	4
HSS Elective*		4
	Credits	16
Spring Semester		
MATH2500	DIFFERENTIAL EQUATIONS	4
MATH2860	LINEAR ALGEBRA & MATRIX THEORY	4
COMP1050	COMPUTER SCIENCE II	4
NON-TECH Non-Technical Elective		4
	Credits	16
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0
	Credits	0
Third Year		
Fall Semester		
MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4

Course	Title	Credits
MATH3900	NUMERICAL ANALYSIS I	4
Technical Elective (p. 80)		4
NON-TECH Non-Technical Elective		4
	Credits	16
Spring Semester		
MATH2200	ADVANCED STATISTICS	4
MATH3950	NUMERICAL ANALYSIS II	4
Technical Elective (p. 80)		4
HSS Elective*		4
	Credits	16
Summer Semester		
COOP3500	COOP EDUCATION 1	0
	Credits	0
Fourth Year		
Fall Semester		
MATH3700	OPERATIONS RESEARCH	4
MATH4900	PARTIAL DIFFERENTIAL EQUATIONS	4
Technical Elective (p. 80)		4
	Credits	12
Spring Semester		
COOP4500	COOP EDUCATION 2	0
	Credits	0
Summer Semester		
MATH5000	APPLIED MATHEMATICS FINAL YEAR DESIGN I	4
Technical Elective (p. 80)		4
HSS Elective*		4
	Credits	12
	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

Non-Technical Electives:

A total of 8 semester credit hours comprised of any two 4-credit courses for which the pre-requisite has been met, in the following subjects: ARCH, COMM, CONN, ECON, ENGL, HIST, HUMN, HSSI, INDS, INTD, LITR, MGMT, MANF, PHIL, POLS, PSYC, SOCL, SURV

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL
- The remaining course 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 20 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 16 semester credit hours of technical electives must be taken as a part of the program. One of the four technical electives must be either MATH4575 COMPLEX VARIABLES, MATH4400 INTRODUCTION TO ABSTRACT ALGEBRA, or MATH4875 REAL ANALYSIS I. 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 Academic Unit including:

Course	Title	Credits
MATH1950	FINANCIAL MATHEMATICS	4
MATH2250	TIME SERIES	4
MATH2425	CRYPTOLOGY	4
MATH3150	STOCHASTIC PROCESSES	4
MATH3100	MEDICAL IMAGING: A MATHEMATICAL APPROACH	4
MATH3200	DIFFERENTIAL GEOMETRY	4
MATH3225	FUNCTIONAL ANALYSIS	4
MATH3250	HAZARD & CATASTROPHE MODELING	4
MATH3500	CALCULUS IV	4
MATH4050	MACHINE LEARNING	4
MATH4100	INDUSTRIAL PROBLEMS IN APPLIED MATHEMATICS	4
MATH4400	INTRODUCTION TO ABSTRACT ALGEBRA	4
MATH4475	ACTUARIAL MATHEMATICS	4
MATH4575	COMPLEX VARIABLES	4
MATH4875	REAL ANALYSIS I	4
MATH4975	REAL ANALYSIS II	4
MATH4950	DYNAMICAL SYSTEMS AND CHAOS	4
MGMT2750	INTEGRATIVE FINANCIAL ACCOUNTING (requires School approval)	4

Any 2000-Level courses in BIOE,BIOL, BMED,CHEM,CIVE,COMPELEC,ELMC,ENGR,ENVM,MECH,PHYS,SCIN will also count as Technical Electives* Prerequisites must be met and School approval is required.

Applied Mathematics Minor

The Applied Mathematics minor (MAPM) 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 a minor, the student must complete three core courses and two elective courses, all with a grade of "C" or higher.

Course	Title	Credits
Required Courses		12 credits

Select one (1) course from the following courses:

Course	Title	Credits
MATH2025	MULTIVARIABLE CALCULUS	4
MATH2500	DIFFERENTIAL EQUATIONS	4
MATH2750	DIFFERENTIAL EQUATIONS & SYSTEMS MODELING	4
and complete the following two courses:		
MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4
MATH2860	LINEAR ALGEBRA & MATRIX THEORY	4
Elective Requirement		8 credits
Select two of the following:		
MATH1950	FINANCIAL MATHEMATICS	4
MATH2200	ADVANCED STATISTICS	4
MATH2250	TIME SERIES	4
MATH2300	DISCRETE MATHEMATICS	4
MATH2425	CRYPTOLOGY	4
MATH3150	STOCHASTIC PROCESSES	4
MATH3225	FUNCTIONAL ANALYSIS	4
MATH3200	DIFFERENTIAL GEOMETRY	4
MATH3250	HAZARD & CATASTROPHE MODELING	4
MATH3500	CALCULUS IV	4
MATH3700	OPERATIONS RESEARCH	4
MATH3800	SPECIAL TOPICS IN APPLIED MATHEMATICS	4
MATH3900	NUMERICAL ANALYSIS I	4
MATH3950	NUMERICAL ANALYSIS II	4
MATH4100	INDUSTRIAL PROBLEMS IN APPLIED MATHEMATICS	4
MATH4400	INTRODUCTION TO ABSTRACT ALGEBRA	4
MATH4475	ACTUARIAL MATHEMATICS	4
MATH4575	COMPLEX VARIABLES	4
MATH4875	REAL ANALYSIS I	4
MATH4975	REAL ANALYSIS II	4
MATH4900	PARTIAL DIFFERENTIAL EQUATIONS	4
MATH4950	DYNAMICAL SYSTEMS AND CHAOS	4
MATH4050	MACHINE LEARNING	4
or COMP4050	MACHINE LEARNING	
Total Credits		20

Please note that the above minor elective list is not necessarily exhaustive. Additional options will be added as new courses are developed in the Applied Mathematics minor. Students with an Applied Mathematics minor will be notified by the School of Computing and Data Science of additional mathematics course offerings as they become available.

Data Science Minor

The Data Science minor (MDSC) 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
Prerequisite courses		
COMP1000 or ELEC3150	COMPUTER SCIENCE I OBJECT ORIENTED PROGRAMMING FOR ENGINEERS	4
MATH1030 or MATH2100	STATISTICS & APPLICATIONS PROBABILITY & STATISTICS FOR ENGINEERS	4
Core Courses		8
COMP3125	DATA SCIENCE FUNDAMENTALS	4
MATH2860	LINEAR ALGEBRA & MATRIX THEORY	4
Elective Courses		12
Select 3 from the following electives (Required to choose electives from 3 different Academic Units s)		
Computer Science		
COMP3750	INTRODUCTION TO BIOSTATISTICS	4
COMP4050	MACHINE LEARNING	4
COMP4700	ARTIFICIAL INTELLIGENCE	4
COMP4750	EMBEDDED ARTIFICIAL INTELLIGENCE	4
Applied Mathematics		
MATH2200	ADVANCED STATISTICS	4
MATH2250	TIME SERIES	4
MATH3700	OPERATIONS RESEARCH	4
MATH4050	MACHINE LEARNING	4
Applied Science		
SCIN2500	SCIENTIFIC COMPUTING	4
Humanities & Social Sciences		
COMM4305	WEB ANALYTICS & MEDIA RESEARCH	4
COMM4335	SEE IT AND SAY IT WITH DATA VIZ	4
PHIL4525	VIRTUAL ETHICS	4
Management		
MGMT1500	DECISION ANALYSIS FOR BUSINESS	4
MGMT2000	MANAGEMENT INFORMATION SYSTEMS	4
MGMT2500	SYSTEMS ANALYSIS & DESIGN	3
Total Credits		20

Actuarial Science Minor

The Actuarial Science minor provides a unique opportunity for students to build relationships with actuarial professionals in the insurance/consulting industry in the greater Boston area. The minor provides students with the fundamentals of risk assurance and 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 Actuarial Science, students must complete a total of sixteen (16) credits. Students will also be required to complete the three pre-requisite courses (12 credits) prior to entering the required course sequence. The Actuarial Science minor is not available to Applied Mathematics majors.

Course	Title	Credits
Prerequisite Courses		
MATH1750	ENGINEERING CALCULUS I	4
MATH1850	ENGINEERING CALCULUS II	4
MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4
Total Credits		12
Course	Title	Credits
Core Requirements		
MATH1950	FINANCIAL MATHEMATICS	4
MATH2250	TIME SERIES	4
MATH4475	ACTUARIAL MATHEMATICS	4
Select one of the following Economics courses:		
ECON4102	PRINCIPLES OF ECONOMICS	4
ECON4152	MACROECONOMICS	4
ECON4154	MICROECONOMICS	4
Total Credits:		16
Course	Title	Credits

Actuarial Science Concentration

The Actuarial Science concentration (CASC) provides a unique opportunity for students to build relationships with actuarial professionals in the insurance/consulting industry in the greater Boston area. The concentration provides students majoring in Applied Mathematics with the fundamentals of risk assurance and 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 concentration in Actuarial Science, Applied Mathematics students must complete a total of sixteen (16) credits, which may also satisfy the sixteen (16) credits of required technical electives for Applied Mathematics majors.

Course	Title	Credits
Prerequisite Courses		
MATH1750 or MATH1775	ENGINEERING CALCULUS I INTEGRATED ENGINEERING CALCULUS I	4
or		
MATH1776 & MATH1777	ACTIVE CALCULUS 1A and ACTIVE CALCULUS 1B	4
and		
MATH1850 or MATH1875	ENGINEERING CALCULUS II INTEGRATED ENGINEERING CALCULUS II	4
or		
MATH1876 & MATH1877	ACTIVE CALCULUS 2A and ACTIVE CALCULUS 2B	4
and		
MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4
TOTAL CREDITS		12
Course	Title	Credits
Core Requirements		
MATH1950	FINANCIAL MATHEMATICS	4
MATH2250	TIME SERIES	4
MATH4475	ACTUARIAL MATHEMATICS	4

Course	Title	Credits	
Select one of the following Economics courses:			
ECON4102	PRINCIPLES OF ECONOMICS	4	
ECON4152	MACROECONOMICS	4	
ECON4154	MICROECONOMICS	4	
TOTAL CREDITS (does not include 12 credits of pre-requisite courses)		16	

Computer Science & Networking

Professor

- Leonidas Deligiannidis, Ph.D.
- Mira Yun, Ph.D.

Associate Professor

- Mehmet Ergezer, Ph.D.
- Yetunde Folajimi, Ph.D.
- Raymond Hansen, M.S.
- Durga Suresh-Menon, M.S.

Assistant Professor

- Magdy M. Ellabidy, M.S.
- Abdullah Al Farooq, Ph.D.
- Fariba Khoshnasib-Zeinabad, Ph.D.
- Frank Kreimendahl, M.S.
- Ashar Neyaz, M.S.
- Salem Othman, Ph.D.
- Weijie Pang, Ph.D.
- Sunjae Park, Ph.D.
- Cuong Pham, Ph.D.
- David Rosenberg, M.S.
- Micah Schuster, Ph.D.

Visiting Assistant Professor

- Umar Albalawi, Ph.D.
- Mohammed Anwaruddin, M.S.
- Koorosh Firouzbakht, Ph.D.
- Joshua Gyllinski, Ph.D.
- Atef Suleiman, Ph.D.

Computer Networking Bachelor of Science

Leading to a 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: 120

This 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
Freshman Year		
Fall Semester		
COMP1000	COMPUTER SCIENCE I	4
COMP1100	INTRODUCTION TO NETWORKS	4
MATH1500	PRECALCULUS	4
English Sequence*		4
	Credits	16
Spring Semester		
COMP1050	COMPUTER SCIENCE II	4
COMP1150	ROUTING AND SWITCHING	4
MATH2300	DISCRETE MATHEMATICS	4
English Sequence*		4
	Credits	16
Sophomore Year		
Fall Semester		
COMP1200	COMPUTER ORGANIZATION	4
COMP2500	SECURITY PRINCIPLES	4
MATH1030	STATISTICS & APPLICATIONS	4
HSS Elective ³		4
	Credits	16

Course	Title	Credits	
Spring Semester			
COMP2150	NETWORK ADMINISTRATION	4	PHYS3800 require School approval to satisfy the Science Elective requirement.
COMP2160	WIRELESS NETWORKS	4	
COMP2650	DATABASES	4	
SCIENCE Elective ²		4	³ Of the three listed humanities and social science electives BSCN students must include and Ethics course: PHIL4401 ENGINEERING ETHICS, PHIL4501 ETHICS, PHIL4525 VIRTUAL ETHICS or PHIL4600 DESIGNING THE GOOD LIFE
	Credits	16	
Summer Semester			
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)		
	Credits	0	
Junior Year			
Fall Semester			
COMP3100	SYSTEM ADMINISTRATION	4	
COMP3500	NETWORK SECURITY	4	
NET Elective ¹		4	
HSS Elective ³		4	
	Credits	16	
Spring Semester			
COOP3500	COOP EDUCATION 1		
	Credits	0	
Summer Semester			
COMP3550	COMPUTER SECURITY	4	
MATH1900	INTRODUCTION TO OPERATIONS RESEARCH	4	
NET Elective ¹		4	
NET Elective ¹		4	
	Credits	16	
Senior Year			
Fall Semester			
COOP4500	COOP EDUCATION 2		
	Credits	0	
Spring Semester			
COMP4650	WEB DEVELOPMENT	4	
COMP4950	PROJECT MANAGEMENT	4	
HSS Elective ³		4	
	Credits	12	
Summer Semester			
COMP5500	SENIOR PROJECT	4	
NET Elective ¹		4	
Advanced Security Elective ¹		4	
	Credits	12	
	Total Credits	120	

¹ Computer Networking students take a total of five major electives. Four electives must be selected from the Computer Networking Electives and at least one 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 School of Computing and Data Science.

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. BIOL2990, Chem2990, PHYS2990, BIOL3800, CHEM3800 and

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL
- The remaining course 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 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

The Computer Networking Electives:

Course	Title	Credits
COMP2000	DATA STRUCTURES	4
COMP2350	ALGORITHMS	4
COMP3125	DATA SCIENCE FUNDAMENTALS	4
COMP3200	ASSEMBLY LANGUAGE	4
COMP3350	PROGRAMMING LANGUAGES	4
COMP3400	OPERATING SYSTEMS	4
COMP3450	PARALLEL COMPUTING AND DISTRIBUTED COMPUTING	4
COMP3575	SCRIPTING FOR CYBERSECURITY AND FORENSICS	4
COMP3580	DIGITAL FORENSICS	4
COMP3590	APPLIED CRYPTOGRAPHY	4
COMP3660	MOBILE APP DEVELOPMENT	4
COMP3750	INTRODUCTION TO BIOSTATISTICS	4
COMP3800	SPECIAL TOPICS IN COMPUTER NETWORKING OR COMPUTER SCIENCE (require School approval to satisfy Computer Networking Electives)	4
COMP4050	MACHINE LEARNING	4
COMP4150	ADVANCED SYSTEM ADMINISTRATION	4
COMP4450	SYSTEMS PROGRAMMING	4
COMP4460	COMPILERS	4
COMP4960	SOFTWARE ENGINEERING	4
COMP4500	OFFENSIVE SECURITY	4
COMP4550	INCIDENT RESPONSE & BUSINESS CONTINUITY	4
COMP4580	NETWORK FORENSICS	4
COMP4590	PUBLIC KEY CRYPTOGRAPHY	4
COMP4600	QUANTUM COMPUTING FOR SECURITY	4
COMP4700	ARTIFICIAL INTELLIGENCE	4
COMP4750	EMBEDDED ARTIFICIAL INTELLIGENCE	4

Course	Title	Credits	Student Outcomes
COMP4775	ADVANCED PARALLEL COMPUTING	4	Graduates of the program will have an ability to:
COMP5050	MODERN COMPUTING	3	
COMP5750	EMBEDDED ARTIFICIAL INTELLIGENCE	4	
COMP5775	ADVANCED PARALLEL COMPUTING	4	
The Advanced Security Electives:			
Course	Title	Credits	
COMP3575	SCRIPTING FOR CYBERSECURITY AND FORENSICS	4	
COMP3580	DIGITAL FORENSICS	4	
COMP3590	APPLIED CRYPTOGRAPHY	4	
COMP4500	OFFENSIVE SECURITY	4	
COMP3800	SPECIAL TOPICS IN COMPUTER NETWORKING OR COMPUTER SCIENCE (require School approval to satisfy Advanced Computer Networking Electives)	4	
COMP4550	INCIDENT RESPONSE & BUSINESS CONTINUITY	4	
COMP4580	NETWORK FORENSICS	4	
COMP4590	PUBLIC KEY CRYPTOGRAPHY	4	
COMP4600	QUANTUM COMPUTING FOR SECURITY	4	

Computer Science Bachelor of Science

Leading to the Bachelor of Science Degree in Computer Science

The 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.

Three Year Program

Total credits for degree: 120

This is a three-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 third year. The courses are as follows:

Course	Title	Credits
Freshman Year		
Fall Semester		
COMP1000	COMPUTER SCIENCE I	4
MATH1776	ACTIVE CALCULUS 1A	2
MATH1777	ACTIVE CALCULUS 1B	2
MATH2300	DISCRETE MATHEMATICS	4
Science Elective ²		4
English Sequence*		4
	Credits	20
Spring Semester		
COMP1050	COMPUTER SCIENCE II	4
COMP1200	COMPUTER ORGANIZATION	4
MATH1876	ACTIVE CALCULUS 2A	2
MATH1877	ACTIVE CALCULUS 2B	2
Science Elective ²		4
English Sequence*		4
	Credits	20
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	
	Credits	0
Sophomore Year		
Fall Semester		
COMP2000	DATA STRUCTURES	4
COMP2100	NETWORK PROGRAMMING	4
COMP2650	DATABASES	4
MATH2860	LINEAR ALGEBRA & MATRIX THEORY	4
HSS Elective*		4
	Credits	20
Spring Semester		
COMP2350	ALGORITHMS	4

Course	Title	Credits	Of the three listed humanities and social science electives, BCOS students must include the one Directed Elective:
COMP3400	OPERATING SYSTEMS	4	
COMP Computer Science Elective ¹		4	
MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4	
HSS Elective*		4	
	Credits	20	
Summer Semester			
COOP3500	COOP EDUCATION 1		
	Credits	0	
Junior Year			
Fall Semester			
COMP3350	PROGRAMMING LANGUAGES	4	
COMP4960	SOFTWARE ENGINEERING	4	
COMP Computer Science Elective ¹		4	
COMP Elective Computer Science Elective ¹		4	
GENERAL Elective		4	
	Credits	20	
Spring Semester			
COOP4500	COOP EDUCATION 2		
	Credits	0	
Summer Semester			
COMP3450	PARALLEL COMPUTING AND DISTRIBUTED COMPUTING	4	
COMP5500	SENIOR PROJECT	4	
COMP Computer Science Elective ¹		4	
HSS Elective*		4	
GENERAL Elective		4	
	Credits	20	
	Total Credits	120	
¹	Computer Science students take a total of four computer science electives. Students must select four courses from the list of Computer Science Electives. The Computer Science Elective courses to be offered in a particular semester will be selected by the School of Computing and Data Science.		
²	BCOS students must take two lab-based science electives selected from the list of approved science courses.		
ENGL/HSS Note			
Students are required to complete:			
<ul style="list-style-type: none"> • At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL • At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL • The remaining course 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 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.			
	Computer Science Electives, select four courses from the following list:		
Course	Title	Credits	
COMP1150	ROUTING AND SWITCHING	4	
COMP2150	NETWORK ADMINISTRATION	4	
COMP2160	WIRELESS NETWORKS	4	
COMP2500	SECURITY PRINCIPLES	4	
COMP3100	SYSTEM ADMINISTRATION	4	
COMP3125	DATA SCIENCE FUNDAMENTALS	4	
COMP3200	ASSEMBLY LANGUAGE	4	
COMP3500	NETWORK SECURITY	4	
COMP3550	COMPUTER SECURITY	4	
COMP3575	SCRIPTING FOR CYBERSECURITY AND FORENSICS	4	
COMP3580	DIGITAL FORENSICS	4	
COMP3590	APPLIED CRYPTOGRAPHY	4	
COMP3660	MOBILE APP DEVELOPMENT	4	
COMP3750	INTRODUCTION TO BIOSTATISTICS	4	
COMP4050	MACHINE LEARNING	4	
COMP4150	ADVANCED SYSTEM ADMINISTRATION	4	
COMP4450	SYSTEMS PROGRAMMING	4	
COMP4460	COMPILERS	4	
COMP4500	OFFENSIVE SECURITY	4	
COMP4550	INCIDENT RESPONSE & BUSINESS CONTINUITY	4	
COMP4580	NETWORK FORENSICS	4	
COMP4590	PUBLIC KEY CRYPTOGRAPHY	4	
COMP4600	QUANTUM COMPUTING FOR SECURITY	4	
COMP4650	WEB DEVELOPMENT	4	
COMP4700	ARTIFICIAL INTELLIGENCE	4	
COMP4750	EMBEDDED ARTIFICIAL INTELLIGENCE	4	
COMP4775	ADVANCED PARALLEL COMPUTING	4	
COMP4950	PROJECT MANAGEMENT	4	
COMP5750	EMBEDDED ARTIFICIAL INTELLIGENCE	4	
COMP5775	ADVANCED PARALLEL COMPUTING	4	
	Science Electives, select two courses from the following list:		
Course	Title	Credits	
BIOL1100	CELL & MOLECULAR BIOLOGY	4	
BIOL1700	ANATOMY & PHYSIOLOGY I	4	
BIOL2200	ADVANCED MOLECULAR BIOLOGY	4	
BIOL3000	APPLICATIONS IN GENETICS	4	
CHEM1100	GENERAL CHEMISTRY I	4	
CHEM1600	GENERAL CHEMISTRY II	4	
PHYS1250	ENGINEERING PHYSICS I	4	
PHYS1750	ENGINEERING PHYSICS II	4	

Course	Title	Credits	Course	Title	Credits		
PHYS2000	INTRODUCTION TO ASTRONOMY	4	Junior Year				
PHYS3100	MODERN PHYSICS	4	Fall Semester				
The following courses require School approval to satisfy the Science Elective requirement							
BIOL2990	INDEPENDENT STUDY IN BIOLOGY	4	COMP3400	OPERATING SYSTEMS	4		
BIOL3800	SPECIAL TOPICS IN BIOLOGY	4	COMP Computer Science Elective ¹		4		
CHEM2990	INDEPENDENT STUDY IN CHEMISTRY	4	SCIENCE Elective ²		4		
CHEM3800	SPECIAL TOPICS IN CHEMISTRY	4	HSS Elective*		4		
PHYS2990	INDEPENDENT STUDY IN PHYSICS	4	Credits		16		
PHYS3800	SPECIAL TOPICS IN PHYSICS	4	Spring Semester				
and							
General Electives: Select any two 4 credit courses.							
Four Year Program							
Total credits for degree: 120							
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	Course	Title	Credits		
Freshman Year							
Fall Semester							
COMP1000	COMPUTER SCIENCE I	4	COOP3500	COOP EDUCATION 1			
MATH1776	ACTIVE CALCULUS 1A	2	Credits		0		
MATH1777	ACTIVE CALCULUS 1B	2	Summer Semester				
MATH2300	DISCRETE MATHEMATICS	4	COMP3350	PROGRAMMING LANGUAGES	4		
English Sequence*		4	COMP3450	PARALLEL COMPUTING AND DISTRIBUTED COMPUTING	4		
		Credits			16		
Spring Semester							
COMP1050	COMPUTER SCIENCE II	4	COMP Computer Science Elective ¹		4		
COMP1200	COMPUTER ORGANIZATION	4	SCIENCE Elective ²		4		
MATH1876	ACTIVE CALCULUS 2A	2	Credits				
MATH1877	ACTIVE CALCULUS 2B	2	Senior Year				
English Sequence*		4	Fall Semester				
		Credits			0		
Sophomore Year							
Fall Semester							
COMP2000	DATA STRUCTURES	4	COOP4500	COOP EDUCATION 2			
COMP2100	NETWORK PROGRAMMING	4	Credits		0		
MATH2860	LINEAR ALGEBRA & MATRIX THEORY	4	Spring Semester				
HSS Elective*		4	COMP4960	SOFTWARE ENGINEERING	4		
		Credits			4		
Spring Semester							
COMP2350	ALGORITHMS	4	COMP Computer Science Elective ¹		4		
COMP2650	DATABASES	4	GENERAL Elective		4		
MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4	Credits		12		
GENERAL Elective		4	Summer Semester				
Summer Semester							
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)		COMP5500	SENIOR PROJECT	4		
		Credits			4		
Credits							
Total Credits							
120							
¹ Computer Science students take a total of four computer science electives. Students must select four courses from the list of Computer Science Electives. The Computer Science Elective courses to be offered in a particular semester will be selected by the School of Computing and Data Science.							
² BCOS students must take two lab-based science electives selected from the list of approved science courses.							
ENGL/HSS Note							
Students are required to complete:							
<ul style="list-style-type: none"> • At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL • At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL • The remaining course 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.							
Credits							
0							

A minimum of 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the three listed humanities and social science electives, BCOS students must include the one Directed Elective:

- An Ethics elective

Computer Science Electives, select four (4) courses from the following list:

The Computer Science Elective courses may include, but are not limited to:

Course	Title	Credits
COMP1150	ROUTING AND SWITCHING	4
COMP2150	NETWORK ADMINISTRATION	4
COMP2160	WIRELESS NETWORKS	4
COMP2500	SECURITY PRINCIPLES	4
COMP3100	SYSTEM ADMINISTRATION	4
COMP3125	DATA SCIENCE FUNDAMENTALS	4
COMP3200	ASSEMBLY LANGUAGE	4
COMP3500	NETWORK SECURITY	4
COMP3550	COMPUTER SECURITY	4
COMP3575	SCRIPTING FOR CYBERSECURITY AND FORENSICS	4
COMP3580	DIGITAL FORENSICS	4
COMP3590	APPLIED CRYPTOGRAPHY	4
COMP3660	MOBILE APP DEVELOPMENT	4
COMP3750	INTRODUCTION TO BIOSTATISTICS	4
COMP4050	MACHINE LEARNING	4
COMP4150	ADVANCED SYSTEM ADMINISTRATION	4
COMP4450	SYSTEMS PROGRAMMING	4
COMP4460	COMPILERS	4
COMP4500	OFFENSIVE SECURITY	4
COMP4550	INCIDENT RESPONSE & BUSINESS CONTINUITY	4
COMP4580	NETWORK FORENSICS	4
COMP4650	WEB DEVELOPMENT	4
COMP4700	ARTIFICIAL INTELLIGENCE	4
COMP4750	EMBEDDED ARTIFICIAL INTELLIGENCE	4
COMP4775	ADVANCED PARALLEL COMPUTING	4
COMP4950	PROJECT MANAGEMENT	4
COMP5750	EMBEDDED ARTIFICIAL INTELLIGENCE	4
COMP5775	ADVANCED PARALLEL COMPUTING	4

Science Electives, select two (2) courses from the following list:

Course	Title	Credits
BIOL1100	CELL & MOLECULAR BIOLOGY	4
BIOL1700	ANATOMY & PHYSIOLOGY I	4
BIOL2200	ADVANCED MOLECULAR BIOLOGY	4
BIOL3000	APPLICATIONS IN GENETICS	4
CHEM1100	GENERAL CHEMISTRY I	4
CHEM1600	GENERAL CHEMISTRY II	4
PHYS1250	ENGINEERING PHYSICS I	4
PHYS1750	ENGINEERING PHYSICS II	4

Course	Title	Credits
PHYS2000	INTRODUCTION TO ASTRONOMY	4
PHYS3100	MODERN PHYSICS	4

The following courses require School approval to satisfy the Science Elective requirement

BIOL2990	INDEPENDENT STUDY IN BIOLOGY	4
BIOL3800	SPECIAL TOPICS IN BIOLOGY	4
CHEM2990	INDEPENDENT STUDY IN CHEMISTRY	4
CHEM3800	SPECIAL TOPICS IN CHEMISTRY	4
PHYS2990	INDEPENDENT STUDY IN PHYSICS	4
PHYS3800	SPECIAL TOPICS IN PHYSICS	4

and

General Electives: Select any two 4 credit courses.

Cybersecurity Bachelor of Science

Leading to a 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 regard cybersecurity across domains of people, process, policy, and technology.
- Graduates are able to define solutions that integrate cybersecurity concepts from the design phase through implementation.
- Graduates are able to apply security principles and practices to the environment, hardware, software, and human aspects of a system.
- 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 maintain operations in the presence of risks and threats.

Total credits for degree: 125

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	Course	Title	Credits			
Freshman Year								
Fall Semester								
COMP1000	COMPUTER SCIENCE I	4	COMP3550	COMPUTER SECURITY	4			
COMP1100 or COMP2100	INTRODUCTION TO NETWORKS or NETWORK PROGRAMMING	4	MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4			
MATH2300	DISCRETE MATHEMATICS	4	COMP Cryptography Elective		4			
English Sequence*		4	HSS Elective*		4			
Credits			Credits					
Spring Semester								
COMP1050	COMPUTER SCIENCE II	4	COMP4500	COOP EDUCATION 2	0			
COMP2500	SECURITY PRINCIPLES	4						
MATH1776	ACTIVE CALCULUS 1A	2	Credits					
MATH1777	ACTIVE CALCULUS 1B	2	COMP4500	OFFENSIVE SECURITY	4			
English Sequence*		4	COMP Cybersecurity Elective ⁶		3 or 4			
			COMP Computer Science Elective ³		4			
Credits			HSS Elective*		4			
Sophomore Year								
Fall Semester								
COMP1200 or ELEC2275	COMPUTER ORGANIZATION or DIGITAL LOGIC	4	COMP4550	INCIDENT RESPONSE & BUSINESS CONTINUITY	4			
COMP2000	DATA STRUCTURES	4	COMP5500	SENIOR PROJECT	4			
MGMT2560	CYBERSECURITY LAW AND POLICY	3	COMP Cybersecurity Elective ⁶		3-4			
MATH1876	ACTIVE CALCULUS 2A	2	MATH/SCI Math or Science Elective ²		4			
MATH1877	ACTIVE CALCULUS 2B	2						
Credits			Credits					
Spring Semester								
COMP2150	NETWORK ADMINISTRATION	4						
COMP2350	ALGORITHMS	4	Total Credits					
MATH2860	LINEAR ALGEBRA & MATRIX THEORY	4	125-127					
HSS Elective*		4						
Credits								
Summer Semester								
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0						
Credits								
Junior Year								
Fall Semester								
COMP3100	SYSTEM ADMINISTRATION	4						
COMP3400	OPERATING SYSTEMS	4						
COMP3500	NETWORK SECURITY	4						
MATH/SCI Math or Science Elective ²		4						
Credits								
Spring Semester								
COOP3500	COOP EDUCATION 1	0						
Credits								

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

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL
- The remaining course 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 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the three listed humanities and social science electives BSCY students must include a Directed Elective:

- An Ethics elective

The Cryptography Electives: select one course from following list

Course	Title	Credits
COMP3590	APPLIED CRYPTOGRAPHY	4
MATH2425	CRYPTOLOGY	4

Cybersecurity Electives: select two courses from the following list

Course	Title	Credits
COMP3575	SCRIPTING FOR CYBERSECURITY AND FORENSICS	4
COMP3580	DIGITAL FORENSICS	4
COMP3590	APPLIED CRYPTOGRAPHY	4
COMP3800	SPECIAL TOPICS IN COMPUTER NETWORKING OR COMPUTER SCIENCE (require School approval to satisfy Cybersecurity Elective)	4
COMP4580	NETWORK FORENSICS	4
COMP4590	PUBLIC KEY CRYPTOGRAPHY	4
ELEC3800	SPECIAL TOPICS IN ELECTRONICS (require School approval to satisfy Cybersecurity Electives)	
ELEC4025	HARDWARE SECURITY	3
MATH2425	CRYPTOLOGY	4
MATH3800	SPECIAL TOPICS IN APPLIED MATHEMATICS (require School approval to satisfy Cybersecurity Electives)	

Computer Science Electives: select one course from the following list

Course	Title	Credits
COMP1150	ROUTING AND SWITCHING	4
COMP2160	WIRELESS NETWORKS	4
COMP2650	DATABASES	4
COMP3125	DATA SCIENCE FUNDAMENTALS	4
COMP3200	ASSEMBLY LANGUAGE	4
COMP3350	PROGRAMMING LANGUAGES	4
COMP3450	PARALLEL COMPUTING AND DISTRIBUTED COMPUTING	4
COMP3660	MOBILE APP DEVELOPMENT	4
COMP3750	INTRODUCTION TO BIOSTATISTICS	4
COMP4050	MACHINE LEARNING	4
COMP3800	SPECIAL TOPICS IN COMPUTER NETWORKING OR COMPUTER SCIENCE (require School approval to satisfy Computing Elective)	4
COMP4150	ADVANCED SYSTEM ADMINISTRATION	4
COMP4450	SYSTEMS PROGRAMMING	4
COMP4950	PROJECT MANAGEMENT	4
COMP4960	SOFTWARE ENGINEERING	4
COMP5050	MODERN COMPUTING	4
COMP5750	EMBEDDED ARTIFICIAL INTELLIGENCE	4
COMP5775	ADVANCED PARALLEL COMPUTING	4

Information Technology Bachelor of Science**Leading to the Bachelor of Science Degree in Information Technology**

Students pursuing a Bachelor of Science in Information Technology (BSIT) gain valuable skills in enterprise infrastructure, information management, system analysis and design, networks and security, network administration, web and mobile systems, software development and project management. Students also apply these skills directly in the field through two required co-op work semesters beginning in their junior year.

Total credits for degree: 120

This 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 which includes 2 required semesters of Co-op course work for a total of 10 required semesters. The degree requirements for the Bachelors of Science in Information Technology (BSIT) include 36 credits in General Education coursework, 52 credits in Foundational coursework, and beginning in the fall semester of the junior year students must declare a concentration comprised of 32 credits in coursework in either Network Infrastructure (CNIN) or Information Technology Operations and Design (CITO).

Course	Title	Credits
Freshman Year		
Fall Semester		
COMP1010	FUNDAMENTALS OF IT	4
COMP1000	COMPUTER SCIENCE I	4
MATH1500	PRECALCULUS	4
English Sequence*		4
Credits		16
Spring Semester		
COMP1050	COMPUTER SCIENCE II	4
COMP1100	INTRODUCTION TO NETWORKS	4
MATH2300	DISCRETE MATHEMATICS	4
English Sequence*		4
Credits		16
Sophomore Year		
Fall Semester		
COMP2010	SYSTEM ANALYSIS & DESIGN	4
COMP2500	SECURITY PRINCIPLES	4
MATH1030	STATISTICS & APPLICATIONS	4
HSS Elective*		4
Credits		16
Spring Semester		
COMP2110	INFRASTRUCTURE DESIGN	4
COMP2160	WIRELESS NETWORKS	4
COMP2210	FUNDAMENTALS OF INFORMATION & DATA MANAGEMENT	4
Science Elective		4
Credits		16

Course	Title	Credits	Course	Title	Credits
Summer Semester			COMP3125	DATA SCIENCE FUNDAMENTALS	4
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0	COMP3210	ADVANCED INFORMATION MANAGEMENT	4
	Credits	0	COMP3660	MOBILE APP DEVELOPMENT	4
Junior Year			COMP IT Operations and Design Concentration Elective 1		4
Fall Semester			COMP IT Operations and Design Concentration Elective 2		4
COMP3010	IT SOFTWARE DEVELOPMENT & MANAGEMENT	4	GENERAL General Elective IT Operations and Design 1		4
Concentration 1		4	Total Credits		32
Concentration 2		4			
HSS Elective*		4			
	Credits	16			
Spring Semester					
COOP3500	COOP EDUCATION 1	0			
	Credits	0			
Summer Semester					
COMP4650	WEB DEVELOPMENT	4			
Concentration 3		4			
COMP IT Elective 1		4			
GENERAL General Elective		4			
	Credits	16			
Senior Year					
Fall Semester					
COOP4500	COOP EDUCATION 2	0			
	Credits	0			
Spring Semester					
COMP4950	PROJECT MANAGEMENT	4			
Concentration 4		4			
HSS Elective*		4			
	Credits	12			
Summer Semester					
COMP5500	SENIOR PROJECT	4			
COMP IT Elective 2		4			
Concentration 5		4			
	Credits	12			
	Total Credits	120			
Concentration in Network Infrastructure (CNIN)					
Course	Title	Credits			
COMP2150	NETWORK ADMINISTRATION	4	Graduates of the Master of Science in Applied Computer Science graduates will:		
COMP3100	SYSTEM ADMINISTRATION	4			
COMP3500	NETWORK SECURITY	4			
COMP3555	EDGE SECURITY	4			
COMP4110	NETWORK DESIGN & MANAGEMENT	4			
COMP Network Infrastructure Concentration Elective 1		4			
COMP Network Infrastructure Concentration Elective 2		4			
GENERAL General Elective Network Infrastructure Concentration		4			
Total Credits		32			
Concentration in IT Operations and Design (CITO)					
Course	Title	Credits			
COMP2150	NETWORK ADMINISTRATION	4			
COMP3100	SYSTEM ADMINISTRATION	4			

Applied Computer Science Master of Science

Leading to a Master of Science Degree in Applied Computer Science

Artificial Intelligence (AI) & Machine Learning (ML) have revolutionized the way we live and work. As organizations continue to find new uses for this exciting technology, the demand for computer scientists trained in their application continues to skyrocket. The thesis-based Master of Science in Applied Computer Science, with concentration in AI, gives students the theoretical and practical skills needed to advance their career and stand out in today's competitive job market. The Master of Science in Applied Computer Science is available in a 4+1 specifically for computer science or closely related majors at Wentworth students completing eight credits of graduate level courses during their senior spring and summer semesters, a 2-Year program which is a more traditional masters degree for students with a baccalaureate degree in computer science or related field, and a 3-Year program which prepares students who have little or no programming experience for entry into the 2-Year program, further allowing any student regardless of their background, to pursue a Master of Science in Applied Computer Science degree.

Program Educational Objectives

At the end of this program, students will be able to:

- Model, analyze, and design computing processes and systems
- Demonstrate mastery of leading-edge techniques and technologies
- Evaluate current and emerging issues in computing

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.

4 +1 Masters of Science in Applied Computer Science: Requirements which include two courses (8 credits) completed during senior year and one additional graduate year starting in the fall. 32 credits

Course	Title	Credits
Spring Semester: Undergraduate Senior Year		
COMP5050	MODERN COMPUTING	4
Summer Semester: Undergraduate Senior Year		
COMP5700	CLASSICAL ARTIFICIAL INTELLIGENCE	4
Grade of B or higher required in undergraduate courses to satisfy requirements in the Master of Science in Applied Computer Science		
Year One: Fall		
COMP5705	DATA MINING	3
or COMP5710	PRINCIPLES OF MACHINE LEARNING	3
AI Elective ²		3
AI Elective ²		3
COMP7500	THESIS I	3
Spring		
AI Elective ²		3
ACS Elective ³		3
General Elective ¹		3
COMP7550	THESIS II	3
Total Credits		32

2-Year Program Master of Science in Applied Computer Science: Requirements for students with a baccalaureate degree in computer science, or related field.

35 credits

Course	Title	Credits
Year 1: Fall		
COMP5050	MODERN COMPUTING	4
General Elective ¹		3
MATH5750	APPLIED STATISTICS	4
Spring		
COMP5700	CLASSICAL ARTIFICIAL INTELLIGENCE	4
AI Elective ²		3
ACS Elective ³		3
Year 2: Fall		
COMP5705	DATA MINING	3
or COMP5710	PRINCIPLES OF MACHINE LEARNING	3
AI Elective ²		3
COMP7500	THESIS I	3
Spring		
AI Elective ²		3
COMP7550	THESIS II	3
Total Credits		35

3-Year Program Master of Science in Applied Computer Science: Requirements for students with any baccalaureate degree to earn a Masters of Science in Applied Computer Science. 55 credits

Course	Title	Credits
Year 1: Fall		
COMP5900	PROGRAMMING FUNDAMENTALS	6
MATH5200	METHODS OF CALCULUS	4
Spring		
COMP5925	DATA STRUCTURES & ALGORITHMS	6
MATH5750	APPLIED STATISTICS	4
Year 2: Fall		
COMP5050	MODERN COMPUTING	4
COMP5710	PRINCIPLES OF MACHINE LEARNING	3
General Elective ¹		3
Spring		
COMP5700	CLASSICAL ARTIFICIAL INTELLIGENCE	4
AI Elective ²		3
ACS Elective ³		3
Year 3: Fall		
COMP5705	DATA MINING	3
or COMP5710	PRINCIPLES OF MACHINE LEARNING	3
AI Elective ²		3
COMP7500	THESIS I	3
Spring		
AI Elective ²		3
COMP7550	THESIS II	3
Total Credits		55

¹ Any graduate level course

² Choose from AI Electives: COMP5750 EMBEDDED ARTIFICIAL INTELLIGENCE, COMP5775 ADVANCED PARALLEL COMPUTING, COMP6760 COMPUTER VISION,* COMP7800 GRADUATE SPECIAL TOPICS IN APPLIED COMPUTER SCIENCE *requires school approval

³ Any graduate level course with a COMP prefix or MATH5710 Machine Learning

Business Analytics Master of Science Leading to a Master of Science Degree in Business Analytics

The Master of Science in Business Analytics is offered 100% online. Learn where it is convenient for you, and complete your degree in less than 1 year, full-time.

In addition, the program will draw on several disciplines to provide a well-rounded, flexible experience. Electives from a cross-section of disciplines and schools will be offered including Applied Mathematics, Computer Science & Networking, Management, and Sciences.

Program Educational Objectives

Hands-on, project-based learning opportunities will give you the skills and knowledge you need to derive data-driven insights. Learn how to prepare data-informed solutions to business-related challenges and implement actionable business strategies based on quantitative modeling. Master the use of data munging/management principles to extract, load, process, and trans-form real-world data. And understand

the ethical consequences of data-informed decision-making and how to communicate data findings effectively.

Top off your experience with a capstone project, integrating what you've learned and the skills you've developed to solve real-world challenges.

Total credits for degree: 33 Credits

Recommended full-time course sequence:

Course	Title	Credits
Semester One		
DATA6100	DATA VISUALIZATION	3
MGMT6150	APPLIED BUSINESS ANALYTICS	3
DATA6200	DATA MANAGEMENT	3
	Credits	9
Semester Two		
DATA6900	CAPSTONE I	3
MGMT6200	QUANTITIVE MANAGEMENT	3
MGMT6250	DATA-DRIVEN MARKETING	3
BUSINESS ANALYTICS ELECTIVE		3
	Credits	12
Semester Three		
DATA6950	CAPSTONE II	3
BUSINESS ANALYTICS ELECTIVE		3
BUSINESS ANALYTICS ELECTIVE		3
BUSINESS ANALYTICS ELECTIVE		3
	Credits	12
	Total Credits	33

Recommended part-time course sequence:

Course	Title	Credits
Year One		
Semester One		
DATA6100	DATA VISUALIZATION	3
MGMT6150	APPLIED BUSINESS ANALYTICS	3
	Credits	6
Semester Two		
MGMT6200	QUANTITIVE MANAGEMENT	3
MGMT6250	DATA-DRIVEN MARKETING	3
	Credits	6
Semester Three		
BUSINESS ANALYTICS ELECTIVE		3
BUSINESS ANALYTICS ELECTIVE		3
	Credits	6
Year Two		
Semester One		
DATA6200	DATA MANAGEMENT	3
	Credits	3
Semester Two		
BUSINESS ANALYTICS ELECTIVE		3
DATA6900	CAPSTONE I	3
	Credits	6
Semester Three		
BUSINESS ANALYTICS ELECTIVE		3

Course	Title	Credits
DATA6950	CAPSTONE II	3
	Credits	6
	Total Credits	33

Electives may include subjects such as Behavior Analytics and Risk Management.

Data Science Master of Science

Leading to a Master of Science Degree in Data Science

Our society is producing an unprecedented amount of data through media outlets, research, and most of our online presence. The tools to analyze and infer from these data are also developing at an accelerated rate. Companies and researchers in a diverse range of fields, including biomedical sciences, financial services, and marketing, are seeking experts to capitalize on the data revolution. The goal of the Master of Science in Data Science program is to enable students to become professional data scientists with the computational skills demanded by the labor market. This accelerated program is taught by interdisciplinary faculty with both academic and industrial expertise and offers flexible delivery options (online and part-time).

Program Educational Outcomes

The program educational outcomes for the Master of Science in Data Science that align with the listed graduate student learning outcomes developed by the Office of Institutional Effectiveness are as follows:

- Develop computational programming abilities to represent and explore data
- Apply statistical data analysis techniques and quantitative modelling to solve data science tasks
- Apply data munging/management principles to extract, load, process, and transform real-world data
- Be aware of ethical consequences of data-informed decision making
- Communicate data findings effectively to an audience, in oral, visual, and/or in written formats

Student Outcomes

Wentworth published the following graduate student learning outcomes developed by the Office of Institutional Effectiveness in The Wentworth Model. Our graduate students will be able to demonstrate their mastery of these skills through the coursework required in the programs. The mapping of the Learning Outcomes to coursework will be as follows:

- Core Knowledge: advanced knowledge in a specialized area consistent with the focus of their graduate program, including critical thinking and problem-solving.
- Scholarly Communication: advanced proficiency in written and oral communication, appropriate to purpose and audience.
- Professionalism: advanced intellectual and organizational skills of professional practice, including ethical conduct.
- 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.

Total credits for degree: 33 credits

Course	Title	Credits
SEMESTER 1		
DATA6000	APPLIED STATISTICS FOR RESEARCH	3
DATA6100	DATA VISUALIZATION	3
DATA6150	DATA SCIENCE FOUNDATIONS	3
SEMESTER 2		
DATA6200	DATA MANAGEMENT	3
DATA6250	MACHINE LEARNING FOR DATA SCIENCE	3
*DATA SCIENCE ELECTIVE		3
DATA6900	CAPSTONE I	3
SEMESTER 3		
DATA6950	CAPSTONE II	3
*DATA SCIENCE ELECTIVE		3
*DATA SCIENCE ELECTIVE		3
*DATA SCIENCE ELECTIVE		3
Total Credits		33

*Data Science Electives are maintained by the School of Computing and Data Science

Computer Networking Minor

The Computer Networking minor (MCNE) 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.

The minor itself requires 16 total credits; however, to enroll in the minor a student must complete both of the prerequisite courses. All courses are 4 credits.

Course	Title	Credits
Prerequisite Courses		
COMP1000	COMPUTER SCIENCE I	4
COMP1100 or COMP2100	INTRODUCTION TO NETWORKS NETWORK PROGRAMMING	4
Networking Courses		
COMP1150	ROUTING AND SWITCHING	4
COMP2150	NETWORK ADMINISTRATION	4
Networking Electives		
Select two (2) courses from the following list:		
COMP2160	WIRELESS NETWORKS	4
COMP2500	SECURITY PRINCIPLES	4
COMP2650 or COMP2670	DATABASES DATABASE MANAGEMENT SYSTEMS	4
COMP3100	SYSTEM ADMINISTRATION	4
COMP3500	NETWORK SECURITY	4
COMP3660	MOBILE APP DEVELOPMENT	4
COMP4150	ADVANCED SYSTEM ADMINISTRATION	4
ELEC3150	OBJECT ORIENTED PROGRAMMING FOR ENGINEERS	4

Course	Title	Credits
COMP4150	ADVANCED SYSTEM ADMINISTRATION	4
COMP4650	WEB DEVELOPMENT	4
Total Credits		24

Computer Science Minor

The Computer Science minor (MCSC) 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.

Course	Title	Credits
Prerequisite Courses		
COMP1000 or ELEC3150	COMPUTER SCIENCE I OBJECT ORIENTED PROGRAMMING FOR ENGINEERS	4
COMP1050	COMPUTER SCIENCE II	4
MATH2300	DISCRETE MATHEMATICS	4

Course	Title	Credits
Core Requirements		
COMP2000	DATA STRUCTURES	4
COMP2350	ALGORITHMS	4
Elective Courses		
Select one of the following:		
COMP1200	COMPUTER ORGANIZATION	4
COMP2100	NETWORK PROGRAMMING	4
COMP2650	DATABASES	4
COMP3125	DATA SCIENCE FUNDAMENTALS	4
COMP3660	MOBILE APP DEVELOPMENT	4
COMP3750	INTRODUCTION TO BIOSTATISTICS	4
COMP4050	MACHINE LEARNING	4
Advanced Electives		
Select one of the following:		
COMP3200	ASSEMBLY LANGUAGE	4
COMP3350	PROGRAMMING LANGUAGES	4
COMP3400	OPERATING SYSTEMS	4
COMP3450	PARALLEL COMPUTING AND DISTRIBUTED COMPUTING	4
COMP3575	SCRIPTING FOR CYBERSECURITY AND FORENSICS	4
COMP3580	DIGITAL FORENSICS	4
COMP3590	APPLIED CRYPTOGRAPHY	4
COMP4450	SYSTEMS PROGRAMMING	4
COMP4460	COMPILERS	4
COMP4580	NETWORK FORENSICS	4
COMP4700	ARTIFICIAL INTELLIGENCE	4
COMP4750	EMBEDDED ARTIFICIAL INTELLIGENCE	4
COMP4775	ADVANCED PARALLEL COMPUTING	4
COMP4960	SOFTWARE ENGINEERING	4
Total Credits		16

Data Science Minor

The Data Science minor (MDSC) 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
Prerequisite courses		
COMP1000 or ELEC3150	COMPUTER SCIENCE I OBJECT ORIENTED PROGRAMMING FOR ENGINEERS	4
MATH1030 or MATH2100	STATISTICS & APPLICATIONS PROBABILITY & STATISTICS FOR ENGINEERS	4
Core Courses		8
COMP3125	DATA SCIENCE FUNDAMENTALS	4
MATH2860	LINEAR ALGEBRA & MATRIX THEORY	4
Elective Courses		12
Select 3 from the following electives (Required to choose electives from 3 different Academic Units s)		
Computer Science		
COMP3750	INTRODUCTION TO BIOSTATISTICS	4
COMP4050	MACHINE LEARNING	4
COMP4700	ARTIFICIAL INTELLIGENCE	4
COMP4750	EMBEDDED ARTIFICIAL INTELLIGENCE	4
Applied Mathematics		
MATH2200	ADVANCED STATISTICS	4
MATH2250	TIME SERIES	4
MATH3700	OPERATIONS RESEARCH	4
MATH4050	MACHINE LEARNING	4
Applied Science		
SCIN2500	SCIENTIFIC COMPUTING	4
Humanities & Social Sciences		
COMM4305	WEB ANALYTICS & MEDIA RESEARCH	4
COMM4335	SEE IT AND SAY IT WITH DATA VIZ	4
PHIL4525	VIRTUAL ETHICS	4
Management		
MGMT1500	DECISION ANALYSIS FOR BUSINESS	4
MGMT2000	MANAGEMENT INFORMATION SYSTEMS	4
MGMT2500	SYSTEMS ANALYSIS & DESIGN	3
Total Credits		20

discipline and industry. This includes understanding how information security is viewed and interacted with in organizations, societies, as well as personally.

The minor requires 20 total credits, however, to enroll in the minor a student must complete the required 8 credits of the English Sequence and COMP1100

Course	Title	Credits
Required Courses		
COMP1500	FOUNDATIONS OF INFORMATION SECURITY	4
COMP2500	SECURITY PRINCIPLES	4
PHIL4525	VIRTUAL ETHICS	4
SOCL4302	CRIMINOLOGY & JUSTICE STUDIES	4
Select one course from the following list:		
COMP5500	SENIOR PROJECT (Students are urged to complete their Senior Project with a component of the project addressing information security)	4
COMP3800	SPECIAL TOPICS IN COMPUTER NETWORKING OR COMPUTER SCIENCE (requires School approval)	4
Total Credits		20

Information Security Awareness Minor

The minor in Information Security Awareness (MISA) provides students with the awareness of information security in the context of people, processes and technologies with their impact on the student's own field. As information and cybersecurity are ingrained in nearly every aspect of our lives, there is substantial value in understanding the foundations of cybersecurity, its unique terminology, and how it can be applied in every

THE SCHOOL OF ENGINEERING

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Vision

Our students change the world.

Mission

To foster the education of competent, creative, entrepreneurial engineering 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 cooperative 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 engineering and computer science for the betterment of society with a broad global perspective.

BIOLOGICAL ENGINEERING

Associate Professor

- Christopher Brigham, Ph.D.

Assistant Professor

- Mary Machado, Ph.D.
- David Simpson, Ph.D.

Biological Engineering Bachelor of Science

Leading to the Bachelor of Science Degree in Biological Engineering

The Bachelor of Science in Biological Engineering program is accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org> (<http://www.abet.org/>)).

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 seek to study engineering and 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

Graduates of the biological engineering program will (within a few years of graduation):

- Effectively contribute to the profession of Biological Engineering or related professional fields.
- Demonstrate leadership and accountability in their chosen fields and make decisions that are socially and ethically responsible.
- Demonstrate personal and professional growth through self-directed or independent studies.

Student Outcomes

Students from the biological engineering program will attain (by the time of graduation):

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: 128

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.

Course	Title	Credits
Freshman Year		
Fall Semester		
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2
ENGR1201	ENGINEERING LABORATORY-BSBE	2
CHEM1100	GENERAL CHEMISTRY I	4
MATH1776	ACTIVE CALCULUS 1A	2
MATH1777	ACTIVE CALCULUS 1B	2
English Sequence*		4
	Credits	16
Spring Semester		
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2
ENGR1401	APPLIED ENGINEERING ANALYSIS-BSBE	2
BIOL1100	CELL & MOLECULAR BIOLOGY	4
MATH1876	ACTIVE CALCULUS 2A	2
MATH1877	ACTIVE CALCULUS 2B	2
English Sequence*		4
	Credits	16
Sophomore Year		
Fall Semester		
BIOE2000	FUNDAMENTALS OF BIOLOGICAL ENGINEERING	4
BIOL2200	ADVANCED MOLECULAR BIOLOGY	4
MATH2500	DIFFERENTIAL EQUATIONS	4
PHYS1250	ENGINEERING PHYSICS I	4
	Credits	16
Spring Semester		
BIOE2100	BIOSTATISTICS FOR BIOENGINEERS	4
BIOE2500	BIOLOGICAL INSTRUMENTATION & MEASUREMENT	4
CHEM1600	GENERAL CHEMISTRY II	4
HSS Elective*		4
	Credits	16
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL) (Optional)	0
	Credits	0

Course	Title	Credits
Junior Year		
Fall Semester		
BIOE3500	GENETICS AND TRANSGENICS	4
CHEM2500	ORGANIC CHEMISTRY I	4
PHYS1750	ENGINEERING PHYSICS II	4
HSS Elective*		4
	Credits	16
Spring Semester		
COOP3500	COOP EDUCATION 1	
	Credits	0
Summer Semester		
BIOE3025	BIOMATERIALS & TISSUE ENGINEERING	4
BIOE3550	UNIT OPERATIONS & PROCESS CONTROL	4
CHEM3550	BIOCHEMISTRY	4
HSS Elective*		4
	Credits	16
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	
	Credits	0
Spring Semester		
BIOE4000	CELL PHYSIOLOGY AND SIGNALING	4
BIOE4500	BIOTRANSPORT PHENOMENA	4
ENGR5000	ENGINEERING SENIOR DESIGN I	4
BIOE Elective		4
	Credits	16
Summer Semester		
BIOE4400	SYNTHETIC BIOLOGY	4
ENGR5500	ENGINEERING SENIOR DESIGN II	4
BIOE Elective		4
HSS Elective*		4
	Credits	16
	Total Credits	128

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities
- At least one course in the Social Sciences
- The remaining course 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 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Biomedical Engineering

Associate Professor

- Ali Kiapour, Ph.D.
- Joseph Martel-Foley, Ph.D.

Assistant Professor

- Uri Feldman, Ph.D.
- Ata Kiapour, Ph.D.
- Xiu Zhai, 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>).

Program Description

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 and 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

Graduates of the biomedical engineering program will (within a few years of graduation):

- 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

Students from the biomedical engineering program will attain (by the time of 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: 128

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.

Course	Title	Credits
Freshman Year		
Fall Semester		
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2
ENGR1202	ENGINEERING LABORATORY-BBME	2
MATH1776	ACTIVE CALCULUS 1A	2
MATH1777	ACTIVE CALCULUS 1B	2
BIOL1100	CELL & MOLECULAR BIOLOGY	4
English Sequence*		4
Credits		16

Course	Title	Credits
Spring Semester		
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2
ENGR1402	APPLIED ENGINEERING ANALYSIS-BBME	2
MATH1876	ACTIVE CALCULUS 2A	2
MATH1877	ACTIVE CALCULUS 2B	2
PHYS1250	ENGINEERING PHYSICS I	4
English Sequence*		4
Credits		16
Sophomore Year		
Fall Semester		
BIOL1700	ANATOMY & PHYSIOLOGY I	4
CHEM1100	GENERAL CHEMISTRY I	4
ELEC2299	ELECTRICAL CIRCUIT ANALYSIS & DESIGN	4
PHYS1750	ENGINEERING PHYSICS II	4
Credits		16
Spring Semester		
BIOL1750	ANATOMY & PHYSIOLOGY II	4
BMED2500	BIOMEDICAL ELECTRONICS & INSTRUMENTATION	4
ELEC2699	INTEGRATED ELECTRONICS	3
MATH2025	MULTIVARIABLE CALCULUS	4
Credits		15
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0
Credits		0
Junior Year		
Fall Semester		
COMP1000	COMPUTER SCIENCE I	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		
CHEM2000	BASICS OF ORGANIC & BIOCHEMISTRY	4
MECH3599	ENGINEERING MECHANICS	4
Biomedical Engineering Elective		4
Engineering Elective		4
Credits		16
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	0
Credits		0
Spring Semester		
BMED4200	BIOMATERIALS & TISSUE ENGINEERING	3
BMED4300	SIGNALS AND SYSTEMS FOR BIOMEDICAL ENGINEERING	3
BMED4400	BIOMECHANICS	4

Course	Title	Credits
BMED5000	BIOMEDICAL ENGINEERING SENIOR DESIGN I	3
Biomedical Engineering Elective		4
	Credits	17
Summer Semester		
BMED4500	ENGINEERING IN BIOMEDICINE	1
BMED4600	BIOSTATISTICS	4
BMED5500	BIOMEDICAL ENGINEERING SENIOR DESIGN II	3
HSS Elective*		4
HSS Elective*		4
	Credits	16
	Total Credits	128

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL
- The remaining course 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 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Civil Engineering

Professor

- James R. Lambrechts, M.S.

Associate Professor

- Leonard Anderson, Ph.D.
- Abigail Charest, Ph.D.
- Gautham Das, Ph.D.
- Anuja Kamat, Ph.D.
- Hadi Kazemiroodsari, Ph.D.

Assistant Professor

- Nasser Yari, Ph.D.

Civil Engineering Bachelor of Science

Leading to a 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>).

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 in any

of several sub-disciplines, including structural, environmental, transportation, or civil engineering.

Program Educational Objectives

Graduates of the civil engineering program will (within a few years of graduation):

- Lifelong Learning— 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— have a successful career in the field of civil engineering or a related field.
- Professionalism— contribute to the field of civil engineering or a related field as a professional.

Student Outcomes

Students from the civil engineering program will attain (by the time of graduation):

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: 128

Course	Title	Credits
Freshman Year		
Fall Semester		
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2
ENGR1203	ENGINEERING LABORATORY-BSCE	2
CHEM1100	GENERAL CHEMISTRY I	4
MATH1750	ENGINEERING CALCULUS I	4
English Sequence*		4
	Credits	16
Spring Semester		
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2
ENGR1403	APPLIED ENGINEERING ANALYSIS-BSCE	2
MATH1850	ENGINEERING CALCULUS II	4
PHYS1250	ENGINEERING PHYSICS I	4
English Sequence*		4
	Credits	16

Course	Title	Credits	Course	Title	Credits
Sophomore Year			HSS Elective*		4
Fall Semester				Credits	15
CIVE2000	STATICS & MECHANICS MATERIALS I	3		Total Credits	128
CIVE2205	INTRODUCTION TO GEOMATICS	4			
CHEM1600	GENERAL CHEMISTRY II	4			
MATH2025	MULTIVARIABLE CALCULUS	4			
	Credits	15			
Spring Semester					
CIVE2300	CAD IN CIVIL ENGINEERING	3			
CIVE2400	CIVIL ENGINEERING MATERIALS	3			
CIVE2500	STATICS & MECHANICS MATERIALS II	4			
MATH2500	DIFFERENTIAL EQUATIONS	4			
MGMT3200	ENGINEERING ECONOMY	3			
	Credits	17			
Summer Semester					
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)				
	Credits	0			
Junior Year					
Fall Semester				Civil Engineering Electives	
CIVE3000	FLUID MECHANICS	4	Course	Title	Credits
CIVE3100	ENVIRONMENTAL ENGINEERING	4	CIVE3250	GIS APPLICATIONS IN CIVIL ENGINEERING	3
CIVE3200	STRUCTURAL ANALYSIS	4	CIVE3350	GREEN ENGINEERING	3
CIVE3300	SOIL MECHANICS	4	CIVE3450	LEGAL ASPECTS OF BOUNDARY SURVEYING	3
Civil Engineering Elective (p. 100)		3	CIVE4100	WATER RESOURCES AND HYDROLOGY	3
	Credits	19	CIVE4200	GEOLOGY FOR CIVIL ENGINEERS	3
Spring Semester			CIVE4225	ENVIRONMENTAL UNIT OPERATIONS	3
COOP3500	COOP EDUCATION 1		CIVE4250	STRUCTURAL STEEL DESIGN	3
	Credits	0	CIVE4300	FOUNDATION ENGINEERING	3
Summer Semester			CIVE4350	REINFORCED CONCRETE DESIGN	3
CIVE3700	HIGHWAY ENGINEERING	4	CIVE4375	WATER AND WASTEWATER TREATMENT	3
CIVE3900	HYDRAULIC ENGINEERING	4			
Civil Engineering Elective (p. 100)		3			
HSS Elective*		4			
	Credits	15			
Senior Year					
Fall Semester					
COOP4500	COOP EDUCATION 2				
	Credits	0			
Spring Semester					
CIVE4000	CIVIL ENGINEERING DESIGN PROJECTS	4			
Science (Biology or Geology) Elective		4			
Civil Engineering Elective (p. 100)		3			
HSS Elective*		4			
	Credits	15			
Summer Semester					
CIVE5500	CIVIL ENGINEERING CAPSTONE DESIGN	4			
MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4			
Civil Engineering Elective (p. 100)		3			

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL
- The remaining course 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 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Civil Engineering Electives

Course	Title	Credits
CIVE3250	GIS APPLICATIONS IN CIVIL ENGINEERING	3
CIVE3350	GREEN ENGINEERING	3
CIVE3450	LEGAL ASPECTS OF BOUNDARY SURVEYING	3
CIVE4100	WATER RESOURCES AND HYDROLOGY	3
CIVE4200	GEOLOGY FOR CIVIL ENGINEERS	3
CIVE4225	ENVIRONMENTAL UNIT OPERATIONS	3
CIVE4250	STRUCTURAL STEEL DESIGN	3
CIVE4300	FOUNDATION ENGINEERING	3
CIVE4350	REINFORCED CONCRETE DESIGN	3
CIVE4375	WATER AND WASTEWATER TREATMENT	3

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 with School approval. Civil Engineering electives may be substituted with an engineering course from another program, an approved engineering course transferred from an accredited engineering program or other relevant coursework with School approval.

Civil Engineering Master of Engineering

Leading to a Master of Engineering in Civil Engineering Degree

The Master of Engineering in Civil Engineering (MEng. CE.) program provides advanced experience with post-graduate civil engineering principles. The Master of Engineering in Civil Engineering (MEng. CE.) is a course-based professional degree that prepares students for the engineering practice. Students must complete a minimum of 31 total credits, which includes a one-credit course in professional perspective. The Master of Engineering in Civil Engineering (MEng. CE.) can be pursued on a full-time basis (three-four courses per semester), leading

to completion in as little as one year, or on a part-time basis (one two courses per semester), leading to completion in under two years. The Master of Engineering in Civil Engineering (MEng. CE.) 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.

Program Goals

The Master of Engineering in Civil Engineering (MEng. CE) program emphasizes 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) 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 the public and private clients.

Student Outcomes

Graduates of the Master of Engineering in Civil Engineering (MEng. CE) program will be able to:

- Demonstrate competence in a computer simulation in civil engineering.
- Demonstrate competence in sustainable engineering design.
- Identify, evaluate, and apply project management tools and techniques to engineering issues pertaining 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.

Total credits for degree: 31 credits

Select 30 credits in CIVE courses and complete ENGR7101

Course	Title	Credits
CIVE7000	CONSTRUCTION ENGINEERING MANAGEMENT	3
CIVE7200	SUSTAINABLE INFRASTRUCTURE	3
CIVE7275	ENVIRONMENTAL BIOLOGICAL SYSTEMS	3
CIVE7300	TRAFFIC ANALYSIS & SAFETY	3
CIVE7375	CONTAMINANT FATE AND TRANSPORT	3
CIVE7500	ADVANCED FOUNDATION ENGINEERING	3
CIVE7575	PHYSICAL & CHEMICAL TREATMENT PROCESSES	3
CIVE7600	ADVANCED STEELE DESIGN	3
CIVE8100	ENGINEERING MODELING & ANALYSIS	3
CIVE8250	ENGINEERING ESTIMATING & SCHEDULING	3
CIVE8400	HIGHWAY DESIGN & TRANSPORTATION PLANNING	3
CIVE8550	SITE PLANNING & DEVELOPMENT	3
CIVE8700	BRIDGE DESIGN	3

Course	Title	Credits
CIVE8900	DIRECTED PROJECTS	3
ENGR7101	PROFESSIONAL PERSPECTIVES	1

Civil Engineering Master of Science

Leading to a Master of Science Degree in Civil Engineering

Program Description

The Master of Science in Civil Engineering—A thesis and research-based program that prepares students for innovative leadership in the field or for further education. Students must complete a minimum of 31 total credits, which includes a minimum of 24 credit hours of regular coursework, six thesis credits, and a one-credit course in professional perspectives. The Master of Science in Civil Engineering can be pursued on a full-time basis (three-four courses per semester), leading to completion in as little as one year, or on a part-time basis (one-two courses per semester), leading to completion in under two years.

Program Educational Outcomes

The Master of Science in Civil Engineering emphasizes 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) and as required 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 Master of Science in Civil Engineering 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 Science in Civil Engineering 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.

Total credits required: 31 credits

Students must complete a minimum of 31 total credits from the following list of courses, which includes a minimum of 24 credit hours of regular coursework, six thesis credits, and a one-credit course in professional perspectives

Course	Title	Credits
Select 24 credits from the following list of CIVE courses		
CIVE7000	CONSTRUCTION ENGINEERING MANAGEMENT	3
CIVE7200	SUSTAINABLE INFRASTRUCTURE	3

Course	Title	Credits
CIVE7275	ENVIRONMENTAL BIOLOGICAL SYSTEMS	3
CIVE7300	TRAFFIC ANALYSIS & SAFETY	3
CIVE7375	CONTAMINANT FATE AND TRANSPORT	3
CIVE7500	ADVANCED FOUNDATION ENGINEERING	3
CIVE7575	PHYSICAL & CHEMICAL TREATMENT PROCESSES	3
CIVE7600	ADVANCED STEELE DESIGN	3
CIVE8100	ENGINEERING MODELING & ANALYSIS	3
CIVE8250	ENGINEERING ESTIMATING & SCHEDULING	3
CIVE8400	HIGHWAY DESIGN & TRANSPORTATION PLANNING	3
CIVE8550	SITE PLANNING & DEVELOPMENT	3
CIVE8700	BRIDGE DESIGN	3

And complete the following three courses:

Course	Title	Credits
Prerequisite Courses		
CHEM1100	GENERAL CHEMISTRY I	4
CIVE3100	ENVIRONMENTAL ENGINEERING	4

Environmental Engineering Minor

The Environmental Engineering (MENV) 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 incorporating the appraisal of human activity impacts on the environment, minimization, and mitigation of such impact, and 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 the following. Other courses may be substituted with the approval of an Associate Dean from the School of Engineering:

Course	Title	Credits
Required Courses		
CIVE3350	GREEN ENGINEERING	3
CIVE4100	WATER RESOURCES AND HYDROLOGY	3
CIVE4225	ENVIRONMENTAL UNIT OPERATIONS	3
CIVE4375	WATER AND WASTEWATER TREATMENT	3
CIVE3800	SPECIAL TOPICS IN CIVIL ENGINEERING	

Total Credits 12

Civil Engineering Minor

The Minor in Civil Engineering (MCIV) 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:

Course	Title	Credits
Select five courses from the following:		
CIVE2205	INTRODUCTION TO GEOMATICS	4
CIVE2400	CIVIL ENGINEERING MATERIALS	3
CIVE3000	FLUID MECHANICS	4
CIVE3100	ENVIRONMENTAL ENGINEERING	4
CIVE4100	WATER RESOURCES AND HYDROLOGY	3
CIVE4200	GEOLOGY FOR CIVIL ENGINEERS	3
CIVE4350	REINFORCED CONCRETE DESIGN	3
ENGR1500	INTRODUCTION TO ENGINEERING DESIGN	3

Total Credits 15-18

Other courses from the Civil Engineering program may be used to complete minor requirements with the approval of an Associate Dean from the School of Engineering.

Professional Land Surveying Certificate

The Professional Land Surveying certificate is intended for professionals currently working in the land surveying field, who are seeking to become registered Professional Land Surveyors 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 certificate is designed to be completed in one academic year with students completing two (2) courses per semester. Students may opt to complete the certificate in a two-year period. Students will be allowed to transfer in one course towards the completion of the Professional Land Surveying certificate.

The Professional Land Surveying certificate is undergoing modifications to rebuild the curriculum. Applications for the 2022-2023 academic year are suspended.

Course	Title	Credits
Year One		
Semester One		
SURV1100	OVERVIEW OF SURVEYING TECHNOLOGY	3
SURV1200	SURVEYING MEASUREMENT I	4

Credits 7

Course	Title	Credits	
Semester Two			
SURV1500	LEGAL ASPECTS OF LAND SURVEYING I	3	
SURV2200	SURVEYING MEASUREMENT II	4	
	Credits	7	
Semester Three			
SURV2250	MA. REGULATIONS AFFECTING SURVEYING PROFESSIONALS	3	Graduates of the computer engineering program will (within a few years of graduation):
SURV2500	LEGAL ASPECTS OF LAND SURVEYING II	3	
	Credits	6	
	Total Credits	20	

Electrical and Computer Engineering

Professor

- Douglas Dow, Ph.D.
- Frederick F. Driscoll, M.S.
- Ali Khabari, Ph.D.
- Jiahui (Jenny) Song, Ph.D.

Associate Professor

- James McCusker, Ph.D.
- Yugu Yang-Keathley, Ph.D.

Assistant Professor

- Federica Aveta, Ph.D.
- Saurav Basnet, Ph.D.
- Wayne Bynoe, Ph.D.
- Filip Cuckov, Ph.D.
- Afsaneh Ghanavati, Ph.D.
- Pilin Junsangsr, Ph.D.
- Marisha Rawlins, Ph.D.
- Kai Ren, Ph.D.
- Latif Tahmid, Ph.D.

Visiting Associate Professor

- Ahmed Hassebo, Ph.D.

Computer Engineering Bachelor of Science

Leading to a 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

- Graduates of the computer engineering program will (within a few years of graduation):
- 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 from the computer engineering program will attain (by the time of 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: 126

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 University, 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.

Course	Title	Credits	Course	Title	Credits
Freshman Year			Technical Elective		3
Fall Semester					Credits
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2	Senior Year		18
ENGR1204	ENGINEERING LABORATORY-BSEE/BSCO	2	Fall Semester		
MATH1750	ENGINEERING CALCULUS I	4	COOP4500	COOP EDUCATION 2	0
MATH2300	DISCRETE MATHEMATICS	4			0
English Sequence*		4	Spring Semester		
	Credits	16	ELEC4075	ENGINEERING OPERATING SYSTEMS	4
Spring Semester			ENGR5000	ENGINEERING SENIOR DESIGN I	4
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2	MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4
ENGR1404	APPLIED ENGINEERING ANALYSIS-BSEE/BSCO	2	HSS Elective*		4
MATH1850	ENGINEERING CALCULUS II	4		Credits	16
PHYS1250	ENGINEERING PHYSICS I	4	Summer Semester		
English Sequence*		4	ENGR5500	ENGINEERING SENIOR DESIGN II	4
	Credits	16	MGMT3200	ENGINEERING ECONOMY	3
Sophomore Year			Technical Elective		3
Fall Semester			HSS Elective*		4
ELEC2250	NETWORK THEORY I	4		Credits	14
ELEC2275	DIGITAL LOGIC	4		Total Credits	126
MATH2500	DIFFERENTIAL EQUATIONS	4	ENGL/HSS Note		
PHYS1750	ENGINEERING PHYSICS II	4	Students are required to complete:		
	Credits	16	<ul style="list-style-type: none"> At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL The remaining course from either the Humanities or Social Sciences category. 		
Spring Semester			Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.		
ELEC2750	NETWORK THEORY II	4	A minimum of 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.		
ELEC2850	MICROCONTROLLERS USING C PROGRAMS	4			
MATH2025	MULTIVARIABLE CALCULUS	4			
HSS Elective*		4			
	Credits	16			
Summer Semester					
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0			
	Credits	0			
Junior Year					
Fall Semester					
ELEC3150	OBJECT ORIENTED PROGRAMMING FOR ENGINEERS	4	Electrical Engineering Bachelor of Science		
ELEC3250	ANALOG CIRCUIT DESIGN	4	Leading to a Bachelor of Science Degree in Electrical Engineering		
ELEC3725	COMPUTER ARCHITECTURE	3			
Technical Elective		3			
	Credits	14			
Spring Semester					
COOP3500	COOP EDUCATION 1	0			
	Credits	0			
Summer Semester					
ELEC3200	ADVANCED DIGITAL CIRCUIT DESIGN	4	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		
ELEC3225	APPLIED PROGRAMMING CONCEPTS	3			
ELEC3550	COMPUTER NETWORKS FOR ENGINEERS	4			
ELEC3600	SIGNALS AND SYSTEMS	4			

experience and teamwork. Our graduates are well prepared for pursuing both an advanced degree and a professional career.

Program Educational Objectives

Graduates of the electrical engineering program will (within a few years of graduation):

- 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 from the electrical engineering program will attain (by the time of graduation):

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 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.
- An ability to communicate effectively with a range of audiences.
- 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.
- 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.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Total credits for degree: 127

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 University, 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.

Course	Title	Credits
Freshman Year		
Fall Semester		
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2

Course	Title	Credits
ENGR1204	ENGINEERING LABORATORY-BSEE/BSCO	2
CHEM1100	GENERAL CHEMISTRY I	4
MATH1750	ENGINEERING CALCULUS I	4
English Sequence*		4
	Credits	16
Spring Semester		
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2
ENGR1404	APPLIED ENGINEERING ANALYSIS-BSEE/BSCO	2
MATH1850	ENGINEERING CALCULUS II	4
PHYS1250	ENGINEERING PHYSICS I	4
English Sequence*		4
	Credits	16
Sophomore Year		
Fall Semester		
ELEC2250	NETWORK THEORY I	4
ELEC2275	DIGITAL LOGIC	4
MATH2500	DIFFERENTIAL EQUATIONS	4
PHYS1750	ENGINEERING PHYSICS II	4
	Credits	16
Spring Semester		
ELEC2750	NETWORK THEORY II	4
ELEC2850	MICROCONTROLLERS USING C PROGRAMS	4
MATH2025	MULTIVARIABLE CALCULUS	4
HSS Elective*		4
	Credits	16
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0
	Credits	0
Junior Year		
Fall Semester		
ELEC3250	ANALOG CIRCUIT DESIGN	4
ELEC3600	SIGNALS AND SYSTEMS	4
MECH3599	ENGINEERING MECHANICS	4
Technical Elective		3
	Credits	15
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
Technical Elective		3
	Credits	18

Course	Title	Credits
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
ELMC3250	ELECTROMAGNETIC FIELD THEORY	3
ENGR5500	ENGINEERING SENIOR DESIGN II	4
HSS Elective*		4
	Credits	15
	Total Credits	127

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL
- The remaining course 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 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Computer Engineering Master of Science

Leading to a Master of Science Degree in Computer Engineering

The Master of Science in Computer Engineering (MSCE) program is designed to provide advanced experience with post-graduate computer engineering principles and skills. The program has a thesis option with 31 required credit hours, and a non-thesis option with 34 required credit hours. Either option has students undertake an individualized engineering development experience, either as a two-course Thesis, or a one-course Master Project. All students are required to complete a one-credit Professional Perspectives course to increase exposure to recent developments and to aspects of professionalism. All students are required to complete a three-course concentration, either one of the predefined concentrations or an individualized concentration. Students may be either full-time or part-time. Although some classes or parts of classes may be remote, the program is designed as an on-campus program. Some of laboratory exercises require use of physical apparatus

in the labs, so students will need to be on-campus for those courses. The expected background of the students is a bachelor's degree in computer engineering or another engineering bachelor's degree that included a significant component of computer engineering (circuits, electronics, computer programming, operating systems, computer architecture). Certain of the concentration or elective courses may have additional expected background related to their field. The transcripts of incoming students will be reviewed to determine whether foundation or prerequisite courses are required or recommended. If a student has been required or recommended to take such a course, a maximum of two graduate-level foundation courses may be applied as elective courses toward the requirements for the MSCE degree. Full-time students may complete the program in two or three semesters (within one calendar year), depending on how many graduate-level engineering courses were transferred in (maximum of six credits) and whether the thesis or non-thesis option is chosen. Part-time students may complete the program in two to four years, depending on transfer credits, the choice of the thesis or non-thesis option, course load per semester, and whether courses are taken during the summer semester.

Program Educational Outcomes

Program educational objectives (PEO) are the accomplishments graduates are expected to achieve during the first few years after graduation with the M.S. degree.

Graduates with an M.S. in Computer Engineering will have the following behavioral characteristics.

- Work toward alleviating problems, challenges or risks in application fields related to computer engineering.
- Apply engineering methodology with confidence and humility to develop innovative and effective solutions in a professional and ethical manner.
- Pursue professional development to meet and adapt to emerging and evolving engineering challenges.

Student Outcomes

In order to fulfill its Mission, Wentworth has established the following Graduate Student Learning Outcomes. The Office of Institutional Effectiveness at WIT developed these Outcomes to be suitable for all graduate programs at WIT. These Outcomes were considered appropriate for the proposed program and were adopted.

Upon graduation, Wentworth Institute of Technology Graduate students will demonstrate:

- Core Knowledge: advanced knowledge in a specialized area consistent with the focus of their graduate program, including critical thinking and problem solving.
- Scholarly Communication: advanced proficiency in written and oral communication, appropriate to purpose and audience.
- Professionalism: advanced intellectual and organizational skills of professional practice, including ethical conduct.
- 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 programs.

The program has a thesis option with 31 required credit hours, and a non-thesis option with 34 required credit hours. Either option has the students undertake an individualized engineering development experience, either as a two-course Thesis, or a one-course Master

Project. All students are required to complete a one-credit Professional Perspectives course to increase exposure to recent developments and to aspects of professionalism. All students are required to complete a three-course concentration, either one of the predefined concentrations or an individualized concentration. The course requirements to complete the MSCE degree are shown in this curriculum table. Students must complete the course requirements with a cumulative GPA of at least 3.0, following Wentworth graduate school policies.

Thesis Option

Course	Title	Credits
Mathematics Requirement		
MATH5800	MATHEMATICAL METHODS	3
or		
ELEC5850	ENGINEERING NUMERICAL METHODS	3
Management Requirement		
MGMT7175	ENGINEERING INNOVATION & ENTREPRENEURSHIP	3
or		
MGMT7100	PROJECT MANAGEMENT APPLICATIONS	3
Professional Perspectives Requirement		
ENGR7101	PROFESSIONAL PERSPECTIVES	1
Graduate Concentration Electives Requirement		
Graduate Electives: 6 three-credit courses		18
ELEC Courses at the 5000 or 6000 Level or other graduate courses with advisor's permission		
Thesis Requirements		
ENGR7100	THESIS I	3
ENGR7200	THESIS II	3
TOTAL CREDITS		31
Non-Thesis Option		
Course	Title	Credits
Mathematics Requirement		
MATH5800	MATHEMATICAL METHODS (o)	3
or		
ELEC5850	ENGINEERING NUMERICAL METHODS	3
Management Requirement		
MGMT7175	ENGINEERING INNOVATION & ENTREPRENEURSHIP	3
or		
MGMT7100	PROJECT MANAGEMENT APPLICATIONS	3
Professional Perspectives Requirement		
ENGR7101	PROFESSIONAL PERSPECTIVES	1
Graduate Concentration Electives Requirement		
Graduate Electives: 8 three credit courses		24
ELEC Courses at the 5000 or 6000 Level or other graduate courses with advisor's permission		
Project Requirement		
ENGR7000	MASTER PROJECT	3
TOTAL CREDITS		34

For students with unrelated undergraduate degree, the following foundation courses may be required or recommended. ELEC5510

FOUNDATIONS OF ELECTRICAL CIRCUITS (3 credits) ELEC5520
 FOUNDATIONS IN SIGNALS AND SYSTEMS (3 credits) DATA6100 DATA VISUALIZATION (3 credits)

The program offers two structured concentrations and one individualized concentration. A student is required to complete one concentration. To fulfill a concentration, the student is required to:

- Complete three of the courses listed with the concentration.
- Complete a thesis or master project that relates to a field of the concentration.

A student may take more than three of the listed courses for the concentration, and any completed extra courses would be counted as electives. A student may attempt to complete two concentrations. The student would need to complete three unique courses per concentration (no course could be counted as one of the three courses for both concentrations). The thesis or master project would need to be related to a field of both concentrations. The concentrations and associated courses are listed below. ELEC courses at the 5000 level do not have a graduate-level prerequisite. ELEC courses at the 6000 level may have a graduate-level prerequisite.

Course	Title	Credits
DIGITAL AND EMBEDDED DESIGN CONCENTRATION		
ELEC5650	EMBEDDED SYSTEMS	3
ELEC5875	ADVANCED COMPUTER ARCHITECTURE	3
ELEC5675	VLSI	3
ELEC5975	PARALLEL COMPUTER ARCHITECTURE	3
ROBOTICS AND PROCESS AUTOMATION CONCENTRATION		
ELEC5700	ROBOTICS & AUTOMATION SYSTEMS	3
ELEC5725	MACHINE PERCEPTION & COGNITION	3
ELEC5750	INDUSTRIAL CONTROLS	3
ELEC6200	CYBER-PHYSICAL SYSTEMS	3
Course		
INDIVIDUALIZED CONCENTRATION		

Students who wish to pursue an Individualized Concentration may submit a proposal to the graduate committee of the program for review. The proposal would include a rational, the name of the concentration and the required courses.

Electrical Engineering Master of Science

Leading to a Master of Science Degree in Electrical Engineering

The Master of Science in Electrical Engineering (MSEE) program is designed to provide advanced experience with post-graduate electrical engineering principles and skills. The program has a thesis option with 31 required credit hours, and a non-thesis option with 34 required credit hours. Either option has the students undertake an individualized engineering development experience, either as a two-course Thesis, or a one-course Master Project. All students are required to complete a one-credit Professional Perspectives course to increase exposure to recent developments and to aspects of professionalism. All students

are required to complete a three-course concentration, either one of the predefined concentrations or an individualized concentration. Students may be either full-time or part-time. Although some classes or parts of classes may be able to be remote, the program is designed as an on-campus program. Some of laboratory exercises require use of physical apparatus in the labs, so students will need to be on-campus for those courses. The expected background of the students is a bachelor's degree in electrical engineering or another engineering bachelor's degrees that included a significant component of electrical engineering (DC and AC circuits, analog and digital electronics, and signal processing). Certain of the concentration or elective courses may have additional expected background related to their field. The transcripts of incoming students will be reviewed to determine whether foundation or prerequisite courses are required or recommended. If a student has been required or recommended to take such a course, a maximum of two graduate-level foundation courses may be applied as elective courses toward the requirements for the MSEE degree. Full-time students may complete the program in two or three semesters (within one calendar year), depending on how many graduate-level engineering courses were transferred in (maximum of six credits), and whether the thesis or non-thesis option is chosen. Part-time students may complete the program in two to four years, depending on transfer credits, the choice of the thesis or non-thesis option, course load per semester, and whether courses are taken during the summer semester.

Program Educational Outcomes

Program educational objectives are the accomplishments graduates are expected to achieve during the first few years after graduation with the M.S. degree.

Graduates with an M.S. in Electrical Engineering will have the following behavioral characteristics.

- Work toward alleviating problems, challenges or risks in application fields related to electrical engineering.
- Apply engineering methodology with confidence and humility to develop innovative and effective solutions in a professional and ethical manner.
- Pursue professional development to meet and adapt to emerging and evolving engineering challenges.

Student Outcomes

In order to fulfill its Mission, Wentworth has established the following Graduate Student Learning Outcomes. The Office of Institutional Effectiveness at WIT developed these Outcomes to be suitable for all graduate programs at WIT. These Outcomes were considered appropriate for the proposed program and were adopted.

Upon graduation, Wentworth Institute of Technology Graduate students will demonstrate:

- Core Knowledge: advanced knowledge in a specialized area consistent with the focus of their graduate program, including critical thinking and problem solving
- Scholarly Communication: advanced proficiency in written and oral communication, appropriate to purpose and audience.
- Professionalism: advanced intellectual and organizational skills of professional practice, including ethical conduct.
- 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 programs

The program has a thesis option with 31 required credit hours, and a non-thesis option with 34 required credit hours. Either option has the students undertake an individualized engineering development experience, either as a two-course Thesis, or a one-course Master Project. All students are required to complete a one-credit Professional Perspectives course to increase exposure to recent developments and to aspects of professionalism. All students are required to complete a three-course concentration, either one of the predefined concentrations or an individualized concentration. The course requirements to complete the MSEE degree are shown in this curriculum table. Students must complete the course requirements with a cumulative GPA of at least 3.0, following Wentworth graduate school policies.

Thesis Option

Course	Title	Credits
Mathematics Requirement		
MATH5800	MATHEMATICAL METHODS	3
or		
ELEC5850	ENGINEERING NUMERICAL METHODS	3
Management Requirement		
MGMT7175	ENGINEERING INNOVATION & ENTREPRENEURSHIP	3
or		
MGMT7100	PROJECT MANAGEMENT APPLICATIONS	3
Professional Perspectives Requirement		
ENGR7101	PROFESSIONAL PERSPECTIVES	1
Graduate Concentration Electives Requirement		
Graduate Electives: 6 three credit courses		18
ELEC 5000 or 6000 Level courses or other gradute courses with advisor's permission.		
THESIS OPTION		
ENGR7100	THESIS I	3
ENGR7200	THESIS II	3
TOTAL CREDITS		31

Non-Thesis Option

Course	Title	Credits
Mathematics Requirement		
MATH5800	MATHEMATICAL METHODS	3
or		
ELEC5850	ENGINEERING NUMERICAL METHODS	3
Management Requirement		
MGMT7175	ENGINEERING INNOVATION & ENTREPRENEURSHIP (or)	3
or		
MGMT7100	PROJECT MANAGEMENT APPLICATIONS	3
Professional Perspective Requirement		
ENGR7101	PROFESSIONAL PERSPECTIVES	
Project Requirement		
ENGR7000	MASTER PROJECT	3
Graduate Concentration Electives Requirement		
Graduate Electives: 8 three-credit courses		24

Course	Title	Credits
ELEC 5000 or 6000 Level courses or other graduate courses with advisor's permission.		
TOTAL CREDITS		34

For students with unrelated undergraduate degree, the following foundation courses may be required or recommended. ELEC5550 DIGITAL SIGNAL PROCESSING (3 credits) ELEC5520 FOUNDATIONS IN SIGNALS AND SYSTEMS (3 credits) DATA6000 APPLIED STATISTICS FOR RESEARCH (3 credits)

Concentrations

The program offers three structured concentrations and one individualized concentration. A student is required to complete one concentration. To fulfill a concentration, the student is required to:

- Complete three of the courses listed with the concentration.
- Complete a thesis or master project that relates to a field of the concentration.

A student may take more than three of the listed courses for the concentration, and any completed extra courses would be counted as electives. A student may attempt to complete two concentrations. The student would need to complete three unique courses per concentration (no course could be counted as one of the three courses for both concentrations). The thesis or master project would need to be related to a field of both concentrations. The concentrations and associated courses are listed below. ELEC courses at the 5000 level do not have a graduate-level prerequisite. ELEC courses at the 6000 level may have a graduate-level prerequisite.

Course	Title	Credits
POWER AND ENERGY CONCENTRATION		
ELEC5825	ELECTRICAL BUILDING SYSTEMS	3
ELEC5560	POWER SYSTEMS ANALYSIS I	3
ELEC5660	POWER SYSTEMS ANALYSIS II	3
ELEC6125	RENEWABLE ENERGY INTEGRATION	3

Course	Title	Credits
ROBOTICS AND PROCESS AUTOMATION CONCENTRATION		
ELEC5700	ROBOTICS & AUTOMATION SYSTEMS	3
ELEC5725	MACHINE PERCEPTION & COGNITION	3
ELEC5750	INDUSTRIAL CONTROLS	3
ELEC6200	CYBER-PHYSICAL SYSTEMS	3

Course	Title	Credits
ELECTROMAGNETICS AND MICROWAVE SENSING CONCENTRATION		
ELEC5900	INTRODUCTION TO RADAR SYSTEMS	3
ELEC5925	INTRODUCTION TO MICROWAVE IMAGING	3
ELEC5950	ANTENNA THEORY	3
ELEC6300	MICROWAVE ENGINEERING	3

Course	Title	Credits
INDIVIDUALIZED CONCENTRATION		
Students who wish to pursue an Individualized Concentration may submit a proposal to the graduate committee of the program for review. The proposal would include a rational, the name of the concentration and the required courses.		

Engineering Technology Associate in Applied Science

Leading to the Associate in Applied Science Degree in Engineering Technology

This part-time degree 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 part-time bachelor's degree program in Project Management. Admission to full-time bachelor's degree programs would require specific technical electives. Consultation with the student's assigned academic advisor is essential to degree planning.

Program Educational Objectives

After graduation, program graduates should demonstrate these abilities:

- Career: Advance their career in a professional field
- Lifelong learning: Exhibit an interest in advancing their knowledge through completing additional degrees or by pursuing professional development

Student Outcomes

Students should demonstrate the following abilities upon graduation:

1. an ability to apply knowledge, techniques, skills, and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline
2. an ability to design solutions for well-defined technical problems and assist with the engineering design of systems, components, or processes appropriate to the discipline
3. an ability to apply written, oral, and graphical communication in well-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature
4. an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results; an
5. an ability to function effectively as a member of a technical team.

Total credits for degree: 60

Course	Title	Credits
ENGL2050	LITERATURE AND COMPOSITION	3
ENGL1050	ENGLISH COMPOSITION	3
MATH1005	COLLEGE MATHEMATICS A	3
MATH1035	COLLEGE MATHEMATICS B	3
MATH1065	COLLEGE MATHEMATICS C	3
PHYS1005	PHYSICS A	3
Elective	Humanities/Social Science	3

Course	Title	Credits	Course	Title	Credits
Elective	Technical	4	Select two courses from the following		
Elective	Technical	4	ELEC3550	COMPUTER NETWORKS FOR ENGINEERS	4
Elective	Technical	4	ELEC4025	HARDWARE SECURITY	3
Elective	Technical	4	ELEC4300	ENGINEERING COMMUNICATION SYSTEMS	4
Elective	Technical	4	COMM4305	WEB ANALYTICS & MEDIA RESEARCH	4
Elective	Technical	4	COMP2500	SECURITY PRINCIPLES	4
Elective	Technical	4	COMP2650	DATABASES	4
Elective	Technical	4	COMP4650	WEB DEVELOPMENT	4
Elective	Technical	3	BMED4800	MEDICAL INFORMATICS & TELEMEDICINE	4
Total Credits		60	MATH4050	MACHINE LEARNING	4
			MATH4100	INDUSTRIAL PROBLEMS IN APPLIED MATHEMATICS	4
			Total Credits		19-20

Electrical Engineering Minor

The Electrical Engineering minor (MEEN) 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:

Course	Title	Credits
Required courses		
ELEC2250	NETWORK THEORY I	4
ELEC2275	DIGITAL LOGIC	4
ELEC2750	NETWORK THEORY II	4
ELEC3250	ANALOG CIRCUIT DESIGN	4
Total Credits		16

Internet of Things Minor

The Internet of Things minor (MIOT) provides students with familiarity and experience developing systems for the Internet of Things (IoT) applications. IoT connects things in the physical world to the computer world using sensors and actuators controlled by computer nodes on the edge of the computer network. The edge nodes process sensor information, communicate to other edge nodes and gateway computers and communicate over internet protocols to cloud servers. IoT systems with knowledge of physical state can monitor, aggregate data, perform analytics and machine learning, and control actuators in complex and empowering ways. Students in the IoT minor will explore and develop systems using computer programming and physical edge modules. The developed systems span nodes of embedded processors connected to sensors and actuators, communication between nodes and the cloud, and cloud servers for storage and analytics.

Course	Title	Credits
One Computer Programming Course		4
Select one of the following courses:		
COMP1000	COMPUTER SCIENCE I	4
ELEC3150	OBJECT ORIENTED PROGRAMMING FOR ENGINEERS	4
Two Core Internet of Things Courses		8
ELEC3025	INTERNET OF THINGS	4
ELEC3650	EMBEDDED SENSOR NETWORK	4
Two Electives Courses		7-8

Interdisciplinary Engineering Biological Engineering Bachelor of Science

Leading to the Bachelor of Science Degree in Biological Engineering

The Bachelor of Science in Biological Engineering program is accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org> (<http://www.abet.org/>)).

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 seek to study engineering and 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

Graduates of the biological engineering program will (within a few years of graduation):

- Effectively contribute to the profession of Biological Engineering or related professional fields.
- Demonstrate leadership and accountability in their chosen fields and make decisions that are socially and ethically responsible.
- Demonstrate personal and professional growth through self-directed or independent studies.

Student Outcomes

Students from the biological engineering program will attain (by the time of graduation):

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: 128

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.

Course	Title	Credits
Freshman Year		
Fall Semester		
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2
ENGR1201	ENGINEERING LABORATORY-BSBE	2
CHEM1100	GENERAL CHEMISTRY I	4
MATH1776	ACTIVE CALCULUS 1A	2
MATH1777	ACTIVE CALCULUS 1B	2
English Sequence*		4
Credits		16
Spring Semester		
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2
ENGR1401	APPLIED ENGINEERING ANALYSIS-BSBE	2
BIOL1100	CELL & MOLECULAR BIOLOGY	4
MATH1876	ACTIVE CALCULUS 2A	2
MATH1877	ACTIVE CALCULUS 2B	2
English Sequence*		4
Credits		16
Sophomore Year		
Fall Semester		
BIOE2000	FUNDAMENTALS OF BIOLOGICAL ENGINEERING	4
BIOL2200	ADVANCED MOLECULAR BIOLOGY	4
MATH2500	DIFFERENTIAL EQUATIONS	4
PHYS1250	ENGINEERING PHYSICS I	4
Credits		16

Course	Title	Credits
Spring Semester		
BIOE2100	BIOSTATISTICS FOR BIOENGINEERS	4
BIOE2500	BIOLOGICAL INSTRUMENTATION & MEASUREMENT	4
CHEM1600	GENERAL CHEMISTRY II	4
HSS Elective*		4
Credits		16
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL) (Optional)	0
Credits		0
Junior Year		
Fall Semester		
BIOE3500	GENETICS AND TRANSGENICS	4
CHEM2500	ORGANIC CHEMISTRY I	4
PHYS1750	ENGINEERING PHYSICS II	4
HSS Elective*		4
Credits		16
Spring Semester		
COOP3500	COOP EDUCATION 1	
Credits		0
Summer Semester		
BIOE3025	BIOMATERIALS & TISSUE ENGINEERING	4
BIOE3550	UNIT OPERATIONS & PROCESS CONTROL	4
CHEM3550	BIOCHEMISTRY	4
HSS Elective*		4
Credits		16
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	
Credits		0
Spring Semester		
BIOE4000	CELL PHYSIOLOGY AND SIGNALING	4
BIOE4500	BIOTRANSPORT PHENOMENA	4
ENGR5000	ENGINEERING SENIOR DESIGN I	4
BIOE Elective		4
Credits		16
Summer Semester		
BIOE4400	SYNTHETIC BIOLOGY	4
ENGR5500	ENGINEERING SENIOR DESIGN II	4
BIOE Elective		4
HSS Elective*		4
Credits		16
Total Credits		128

ENGL/HSS Note

Students are required to complete:

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

- The remaining course 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 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Electromechanical Engineering Bachelor of Science

Leading to a Bachelor of Science Degree in Electromechanical Engineering

The Bachelor of Science in Electromechanical Engineering is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

The Electromechanical Engineering (BELM) program is a four-year engineering program with a dynamic interdisciplinary character and unique approach to learning. Grounded in a solid foundation of mathematics, science, and humanities, and social sciences, the BELM program incorporates all the essential elements of an electrical and mechanical engineering curriculum. The BELM program features engineering design courses, extensive exposure to engineering problem-solving, and a faculty committee management structure that responds quickly to industrial change and academic needs. Wentworth stresses the importance of hands-on experience and extensive lab work. BELM students spend a significant amount of time working in our state-of-the-art laboratories with computers and microprocessors being a large part of the program. Students use computers and test equipment extensively to verify and develop principles of engineering in diverse areas including mechanics of materials, embedded microcontroller systems, analog, and digital circuit design, thermodynamics, vibrations, materials science, feedback controls, and machine design.

Program Educational Objectives

Graduates of the electromechanical engineering program will (within a few years of graduation):

- 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 from the electromechanical engineering program will attain (by the time of graduation):

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 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.
- An ability to communicate effectively with a range of audiences.
- 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.
- 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.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Total credits for degree: 129 credits

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.

Course	Title	Credits
Freshman Year		
Fall Semester		
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2
ENGR1205	ENGINEERING LABORATORY-BELM	2
MATH1750	ENGINEERING CALCULUS I	4
PHYS1250	ENGINEERING PHYSICS I	4
English Sequence*		4
	Credits	16
Spring Semester		
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2
ENGR1405	APPLIED ENGINEERING ANALYSIS-BELM	2
MATH1850	ENGINEERING CALCULUS II	4
PHYS1750	ENGINEERING PHYSICS II	4
English Sequence*		4
	Credits	16
Sophomore Year		
Fall Semester		
ELEC2275	DIGITAL LOGIC	4
MECH2300	ENGINEERING GRAPHICS	3
CHEM1100	GENERAL CHEMISTRY I	4
MATH2500	DIFFERENTIAL EQUATIONS	4
HSS Elective*		4
	Credits	19
Spring Semester		
ELEC2300	CIRCUIT ANALYSIS	4
MECH2250	ENGINEERING THERMODYNAMICS I	4
MECH2400	APPLIED MECHANICS	4

Course	Title	Credits	
MATH2025	MULTIVARIABLE CALCULUS	4	Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.
	Credits	16	
Summer Semester			A minimum of 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0	
	Credits	0	
Junior Year			
Fall Semester			
ELEC2850	MICROCONTROLLERS USING C PROGRAMS	4	
ELEC3250	ANALOG CIRCUIT DESIGN	4	
MECH3100	ENGINEERING FLUID MECHANICS	4	
MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4	
COOP2500	CO-OP INSTITUTE	0	
	Credits	16	
Spring Semester			
COOP3500	COOP EDUCATION 1		
	Credits	0	
Summer Semester			
ELEC3600	SIGNALS AND SYSTEMS	4	
MECH3600	MATERIALS SCIENCE	4	
MECH3900	ENGINEERING HEAT TRANSFER	4	
Technical Elective		3	
	Credits	15	
Senior Year			
Fall Semester			
COOP4500	COOP EDUCATION 2		
	Credits	0	
Spring Semester			
ELEC4475	FEEDBACK AND CONTROL	4	
ELMC5000	SENIOR DESIGN I	4	
MECH3850	ENGINEERING DYNAMICS	4	
HSS Elective*		4	
	Credits	16	
Summer Semester			
ELMC4125	ELECTROMECHANICAL SYSTEMS	4	
ELMC5500	SENIOR DESIGN II	4	
Technical Elective		3	
HSS Elective*		4	
	Credits	15	
	Total Credits	129	

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL
- The remaining course from either the Humanities or Social Sciences category.

Engineering Bachelor of Science

Leading to a 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 can integrate an engineering concentration course of study with directed studies or minor(s) of their choice to broaden their education for their professional and personal goals. Students work with the associate dean 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 of directed studies or minor(s). The BSEN program allows students to compliment an engineering curriculum with directed study courses/ minor(s) 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, or Mechanical, as well as a minor(s)/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 advisers 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 supporting the engineering discipline
- A set of general education courses providing 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(s) courses providing a pathway for students' 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: 45 credits
- Mathematics and Basic Science: 32 credits
- General Education: 20 credits
- Electives: 16 credits
- Business / Management: 18 credits

Program Educational Objectives

Graduates of the engineering program will (within a few years of graduation):

- Pursue a life of curiosity and passion to explore the diverse applications of engineering
- Apply Engineering fundamentals with confidence and humility to develop innovative and effective solutions in a professional and ethical manner
- Pursue professional development to meet and adapt to emerging and evolving engineering challenges

Student Outcomes

Students from the engineering program will attain (by the time of graduation):

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 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.
- An ability to communicate effectively with a range of audiences.
- 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.
- 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.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Total credits for degree: 127-130

Wentworth's Bachelor of Science in Engineering (BSEN) is a 4-year innovative interdisciplinary degree for students who prefer 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 five possible engineering areas (1) Biomedical, (2) Civil, (3) Computer, (4) Electrical, (5) Mechanical; and directed studies/minor(s) areas.

Minor Option

Students may select a minor from a variety of Academic Units through the School of Architecture and Design, the School of Computing and Data Science, the School of Management, and School of Sciences and Humanities, fulfill their minor(s) requirements.

Electives

Students may select courses 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 a faculty advisor and/or a full-time faculty member, students design an engineering education meeting individualized personal and professional goals.

Course	Title	Credits
Freshman Year		
Fall Semester		
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2
ENGR1206	ENGINEERING LABORATORY-BSEN	2
MATH1750	ENGINEERING CALCULUS I	4
PHYS1250	ENGINEERING PHYSICS I	4
English Sequence*		4
	Credits	16
Spring Semester		
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2
ENGR1406	APPLIED ENGINEERING ANALYSIS-BSEN	2
MATH1850	ENGINEERING CALCULUS II	4
PHYS1750	ENGINEERING PHYSICS II	4
English Sequence*		4
	Credits	16
Sophomore Year		
Fall Semester		
MATH2025	MULTIVARIABLE CALCULUS	4
Engineering Concentration (EC) 1		3
Computer Science (COMP) Elective 1		4
Elective 1		4
	Credits	15
Spring Semester		
MATH2500	DIFFERENTIAL EQUATIONS	4
Engineering Concentration (EC) 2		4
Engineering Concentration (EC) 3		4
Elective 2		3
	Credits	15
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0
	Credits	0
Junior Year		
Fall Semester		
Engineering Concentration (EC) 4		4
Engineering Concentration (EC) 5		4
Management Elective (MGMT) 1		3
HSS Elective*		4
Elective 3		3
	Credits	18
Spring Semester		
COOP3500	COOP EDUCATION 1	0
	Credits	0
Summer Semester		
ENGR3500	ENGINEERING JUNIOR DESIGN	4
Engineering Concentration (EC) 6		4
Management Elective (MGMT) 2		3

Course	Title	Credits	Action	Year	Term	Next Step
HSS Elective*		4	Study Abroad interest	Freshman/ Sophomore	Fall or Sophomore Year	Meet with an Associate Dean of the School of Engineering
	Credits	15				
Senior Year						
Fall Semester						
COOP4500	COOP EDUCATION 2	0	Study Abroad semester	Junior	FALL	Prior discussions and paperwork with Associate Dean of the School of Engineering
	Credits	0				
Spring Semester						
Capstone 1		3				
Engineering Concentration (EC) 7		4				
Engineering Concentration (EC) 8		4				
MA/SC Math or Science Elective 1		4				
Elective 4		3				
	Credits	18				
Summer Semester						
Capstone 2		3				
Engineering Concentration (EC) 9		3				
MA/SC Math or Science Elective 2		4				
HSS Elective*		4				
	Credits	14				
	Total Credits	127				

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL
- The remaining course 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 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

BSEN Program Timeline

Action	Year	Term	Next Step	Credits
Registration Access Codes	Freshman	FALL/SPRING	Meet with (RACs access code, 'Alternate PIN') Advisor/Student Success Advisor	16
Concentration Declaration	Freshman	FALL for BMED Concentration/ all other concentrations SPRING	Meet with Faculty Advisor or Student Success Advisor	16
Minor Declaration	Freshman	FALL for BMED minor/ all other minors SPRING	Meet with Faculty Advisor or Student Success Advisor	15
Sophomore Year				
Fall Semester				
BIOL1700			ANATOMY & PHYSIOLOGY I	4
ELEC2299			ELECTRICAL CIRCUIT ANALYSIS & DESIGN	4
MATH2025			MULTIVARIABLE CALCULUS	4
PHYS1750			ENGINEERING PHYSICS II	4
			Credits	16
Spring Semester				
BIOL1750			ANATOMY & PHYSIOLOGY II	4
BMED2500			BIOMEDICAL ELECTRONICS & INSTRUMENTATION	4
CHEM1100			GENERAL CHEMISTRY I	4
ELEC2699			INTEGRATED ELECTRONICS	3
			Credits	15
Junior Year				
Fall Semester				
COMP1000			COMPUTER SCIENCE I	4
MATH2750			DIFFERENTIAL EQUATIONS & SYSTEMS MODELING	4

Engineering Bachelor of Science with a Concentration in Biomedical Engineering

Course	Title	Credits	Course	Title	Credits
Management Elective (MGMT) 1		3	ENGR1403	APPLIED ENGINEERING ANALYSIS-BSCE	2
HSS Elective*		4	English Sequence*		4
	Credits	15		Credits	16
Spring Semester			Sophomore Year		
COOP3500	COOP EDUCATION 1	0	MATH2025	MULTIVARIABLE CALCULUS	4
	Credits	0	CHEM1100	GENERAL CHEMISTRY I	4
Summer Semester			CIVE2000	STATICS & MECHANICS MATERIALS I	3
ENGR3500	ENGINEERING JUNIOR DESIGN	4	CIVE2205	INTRODUCTION TO GEOMATICS	4
MECH3599	ENGINEERING MECHANICS	4	Elective 1		3
Management Elective (MGMT) 2		3		Credits	18
HSS Elective*		4	CIVE2300	CAD IN CIVIL ENGINEERING	3
Elective 1		4	CIVE2400	CIVIL ENGINEERING MATERIALS	3
	Credits	19	CIVE2500	STATICS & MECHANICS MATERIALS II	4
Senior Year			MATH2500	DIFFERENTIAL EQUATIONS	4
Fall Semester			Computer Science Elective (COMP) 1		4
COOP4500	COOP EDUCATION 2	0		Credits	18
	Credits	0	Junior Year		
Spring Semester			CIVE3000	FLUID MECHANICS	4
BMED4200	BIOMATERIALS & TISSUE ENGINEERING	3	CIVE3300	SOIL MECHANICS	4
BMED4400	BIOMECHANICS	4	Management Elective (MGMT) 1		3
BMED5000	BIOMEDICAL ENGINEERING SENIOR DESIGN I	3	Elective 2		3
Elective 2		4		Credits	14
	Credits	14	Spring Semester		
Summer Semester			COOP3500	COOP EDUCATION 1	0
BMED4300	SIGNALS AND SYSTEMS FOR BIOMEDICAL ENGINEERING	4		Summer Semester	
BMED4600	BIOSTATISTICS	4	CIVE3900	HYDRAULIC ENGINEERING	4
BMED5500	BIOMEDICAL ENGINEERING SENIOR DESIGN II	4	ENGR3500	ENGINEERING JUNIOR DESIGN	4
HSS Elective*		4	Management Elective (MGMT) 2		3
	Credits	16	HSS Elective*		4
Total Credits		127		Credits	15

Engineering Bachelor of Science with a Concentration in Civil Engineering

Course	Title	Credits
Freshman Year		
Fall Semester		
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2
ENGR1203	ENGINEERING LABORATORY-BSCE	2
MATH1750	ENGINEERING CALCULUS I	4
PHYS1250	ENGINEERING PHYSICS I	4
English Sequence*		4
	Credits	16
Spring Semester		
PHYS1750	ENGINEERING PHYSICS II	4
MATH1850	ENGINEERING CALCULUS II	4
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2
Summer Semester		
CIVE4000	CIVIL ENGINEERING DESIGN PROJECTS	4
Elective 3		3
Elective 4		3
HSS Elective*		4
	Credits	14
Summer Semester		
CIVE5500	CIVIL ENGINEERING CAPSTONE DESIGN	4
Civil Engineering Elective 1		4
Science-Geology/Biology Elective		4

Course	Title	Credits	Course	Title	Credits
HSS Elective*		4			
	Credits	16			
	Total Credits	127			
Engineering Bachelor of Science with a Concentration in Computer Engineering					
Course	Title	Credits	Course	Title	Credits
Freshman Year					
Fall Semester					
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2	ELEC3225	APPLIED PROGRAMMING CONCEPTS	3
ENGR1204	ENGINEERING LABORATORY-BSEE/BSCO	2	ELEC3350	SOLID STATE DEVICES	3
MATH1750	ENGINEERING CALCULUS I	4	ENGR3500	ENGINEERING JUNIOR DESIGN	4
PHYS1250	ENGINEERING PHYSICS I	4	Computer Science Elective (COMP) 1		4
English Sequence*		4	HSS Elective*		4
	Credits	16		Credits	18
Spring Semester					
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2	COOP4500	COOP EDUCATION 2	0
ENGR1404	APPLIED ENGINEERING ANALYSIS-BSEE/ BSCO	2		Credits	0
MATH1850	ENGINEERING CALCULUS II	4			
PHYS1750	ENGINEERING PHYSICS II	4			
English Sequence*		4			
	Credits	16			
Sophomore Year					
Fall Semester					
ELEC2250	NETWORK THEORY I	4	ENGR5500	ENGINEERING SENIOR DESIGN II	4
ELEC2275	DIGITAL LOGIC	4	Management Elective (MGMT) 2		3
Math/Science Elective 1		4	Math/Science Elective 2		4
Elective 1		4	HSS Elective*		4
	Credits	16	Elective 4		3
Spring Semester				Credits	18
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2			
ENGR1404	APPLIED ENGINEERING ANALYSIS-BSEE/ BSCO	2			
MATH1850	ENGINEERING CALCULUS II	4			
PHYS1750	ENGINEERING PHYSICS II	4			
English Sequence*		4			
	Credits	16		Total Credits	129
Engineering Bachelor of Science with a Concentration in Electrical Engineering					
Course	Title	Credits	Course	Title	Credits
Freshman Year					
Fall Semester					
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2			
ENGR1204	ENGINEERING LABORATORY-BSEE/BSCO	2			
MATH1750	ENGINEERING CALCULUS I	4			
PHYS1250	ENGINEERING PHYSICS I	4			
English Sequence*		4			
	Credits	16			
Spring Semester					
ELEC2750	NETWORK THEORY II	4			
ELEC2850	MICROCONTROLLERS USING C PROGRAMS	4			
MATH2025	MULTIVARIABLE CALCULUS	4			
HSS Elective*		4			
	Credits	16			
Junior Year					
Fall Semester					
ELEC3150	OBJECT ORIENTED PROGRAMMING FOR ENGINEERS	4			
ELEC3725	COMPUTER ARCHITECTURE	3			
Management Elective (MGMT) 1		3			
Elective 2		4			
	Credits	14			
Spring Semester					
COOP3500	COOP EDUCATION 1				
	Credits	0			
Sophomore Year					
Fall Semester					
ELEC2250	NETWORK THEORY I	4			

Course	Title	Credits
ELEC2275	DIGITAL LOGIC	4
MATH2500	DIFFERENTIAL EQUATIONS	4
Computer Science Elective (COMP) 1		4
	Credits	16
Spring Semester		
ELEC2750	NETWORK THEORY II	4
MATH2025	MULTIVARIABLE CALCULUS	4
ELEC2850	MICROCONTROLLERS USING C PROGRAMS	4
HSS Elective*		4
	Credits	16
Junior Year		
Fall Semester		
ELEC3250	ANALOG CIRCUIT DESIGN	4
ELEC3600	SIGNALS AND SYSTEMS	4
Management Elective (MGMT) 1		3
Elective 1		3
HSS Elective*		4
	Credits	18
Spring Semester		
COOP3500	COOP EDUCATION 1	
	Credits	0
Summer Semester		
ELEC3150	OBJECT ORIENTED PROGRAMMING FOR ENGINEERS	4
ENGR3500	ENGINEERING JUNIOR DESIGN	4
ELEC4475	FEEDBACK AND CONTROL	4
HSS Elective*		4
	Credits	16
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	
	Credits	0
Spring Semester		
ENGR5000	ENGINEERING SENIOR DESIGN I	3
Math/Science Elective 1		4
Math/Science Elective 2		4
Management Elective (MGMT) 2		3
Elective 2		3
	Credits	17
Summer Semester		
ELEC4300	ENGINEERING COMMUNICATION SYSTEMS	4
ENGR5500	ENGINEERING SENIOR DESIGN II	4
HSS Elective*		4
Elective 3		3
	Credits	15
	Total Credits	130

Engineering Bachelor of Science with a Concentration in Mechanical Engineering

Course	Title	Credits
Freshman Year		
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2
ENGR1207	ENGINEERING LABORATORY-BSME	2
MATH1750	ENGINEERING CALCULUS I	4
PHYS1250	ENGINEERING PHYSICS I	4
English Sequence*		4
	Credits	16
Spring Semester		
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2
ENGR1407	APPLIED ENGINEERING ANALYSIS-BSME	2
MATH1850	ENGINEERING CALCULUS II	4
PHYS1750	ENGINEERING PHYSICS II	4
English Sequence*		4
	Credits	16
Sophomore Year		
Fall Semester		
MECH2250	ENGINEERING THERMODYNAMICS I	4
MATH2025	MULTIVARIABLE CALCULUS	4
Computer Science Course (COMP)		4
Math/Science Elective 1		4
Elective 1		3
	Credits	19
Spring Semester		
MATH2500	DIFFERENTIAL EQUATIONS	4
MECH2000	ENGINEERING STATICS	4
MECH2300	ENGINEERING GRAPHICS	3
MECH3100	ENGINEERING FLUID MECHANICS	4
	Credits	15
Junior Year		
Fall Semester		
MECH2500	MECHANICS OF MATERIALS	4
MECH3900	ENGINEERING HEAT TRANSFER	4
Management Elective (MGMT) 1		3
Elective 2		3
	Credits	14
Spring Semester		
COOP3500	COOP EDUCATION 1	
	Credits	0
Summer Semester		
ENGR3500	ENGINEERING JUNIOR DESIGN	4
MECH3850	ENGINEERING DYNAMICS	4
Management Elective (MGMT) 2		3
HSS Elective*		4
	Credits	15

Course	Title	Credits
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	0
Spring Semester		
MECH3600	MATERIALS SCIENCE	4
MECH5000	MECHANICAL ENGINEERING CAPSTONE ANALYSIS	3
Elective 3		3
Engineering Elective 1		3
HSS Elective*		4
Summer Semester		
MECH5500	MECHANICAL ENGINEERING CAPSTONE PROJECT	4
HSS Elective*		4
Math/Science Elective 2		4
Elective 4		3
Total Credits		
		15
Total Credits		
		127

Mechanical Engineering

Professor

- Xiaobin Le, Ph.D.
- Guohua Ma, Ph.D.
- Masoud Olia, Ph.D.
- Mansour Zenouzi, Ph.D.

Associate Professor

- Haifa El-Sadi, Ph.D.
- Theodore Greene, M.S.
- Michael E. Jackson, M.Ed.
- Ilie Talpasanu, Ph.D.
- Bo Tao, Ph.D.
- Serdar Tumkor, Ph.D.
- John Voccio, Ph.D.

Assistant Professor

- Abhishek Kumar, Ph.D.
- Alireza Mahdavi Nejad, Ph.D.

Visiting Associate Professor

- Radu Ceausu, Ph.D.

Aerospace Engineering Minor

The Aerospace Engineering minor (MAER) 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.

Course	Title	Credits
Required Courses		
MECH2300	ENGINEERING GRAPHICS	3
MECH2750	ENGINEERING THERMODYNAMICS II	4
MECH3200	NUMERICAL SIMULATION & CFD	4
MECH3350	GAS DYNAMICS	4
MECH3650	AERODYNAMICS	4
Total Credits		19

Manufacturing Minor

Students who select the Manufacturing minor (MMFG) 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.

Course	Title	Credits
Required Courses		
MANF1000	MANUFACTURING PROCESSES	4
MANF2000	COMPUTER AIDED MANUFACTURING	3
MANF3000	MANUFACTURING ENGINEERING	3
MECH2300	ENGINEERING GRAPHICS	3
One course in economics		4
PSYC4552	INDUSTRIAL ORGANIZATION PSYCHOLOGY	4
Total Credits		21

Mechanical Engineering Bachelor of Science

Leading to a 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 manufacturing documentation), and a faculty commitment 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 engineering principles 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

Graduates of the mechanical engineering program will (within a few years of graduation):

- Contribute significantly in the design and development of complex systems within the field of engineering.
- Work effectively as members of multidisciplinary teams that analyze data critically, synthesize information, and implement ethical solutions for the betterment of society.
- Prepare and presenting technical information professionally to various audiences.
- Further their education either through directed or independent studies to advance them personally and professionally.

Student Outcomes

Students from the mechanical engineering program will attain (by the time of 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: 128

Mechanical Engineering 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 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.

Course	Title	Credits
Freshman Year		
Fall Semester		
ENGR1100	INTRODUCTION TO ENGINEERING EXPERIENCE	2
ENGR1207	ENGINEERING LABORATORY-BSME	2
MATH1750	ENGINEERING CALCULUS I	4
PHYS1250	ENGINEERING PHYSICS I	4
English Sequence		4
	Credits	16
Spring Semester		
ENGR1300	FIRST-YEAR ENGINEERING DESIGN	2
ENGR1407	APPLIED ENGINEERING ANALYSIS-BSME	2
MATH1850	ENGINEERING CALCULUS II	4
PHYS1750	ENGINEERING PHYSICS II	4
English Sequence		4
	Credits	16
Sophomore Year		
Fall Semester		
MECH2000	ENGINEERING STATICS	4
MECH2300	ENGINEERING GRAPHICS	3
ELEC2799	CIRCUIT THEORY AND APPLICATION	3
MATH2025	MULTIVARIABLE CALCULUS	4
	Credits	14
Spring Semester		
MECH2250	ENGINEERING THERMODYNAMICS I	4
MECH2500	MECHANICS OF MATERIALS	4
CHEM1100	GENERAL CHEMISTRY I	4
MATH2500	DIFFERENTIAL EQUATIONS	4
	Credits	16
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0
	Credits	0
Junior Year		
Fall Semester		
MECH2750	ENGINEERING THERMODYNAMICS II	4
MECH3000	DESIGN OF MACHINE ELEMENTS	4
MECH3100	ENGINEERING FLUID MECHANICS	4
Technical Elective		3
HSS Elective*		4
	Credits	19
Spring Semester		
COOP3500	COOP EDUCATION 1	0
	Credits	0
Summer Semester		
MECH3600	MATERIALS SCIENCE	4
MECH3850	ENGINEERING DYNAMICS	4
MECH3900	ENGINEERING HEAT TRANSFER	4

Course	Title	Credits
MATH2100	PROBABILITY & STATISTICS FOR ENGINEERS	4
Credits		
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	0
Credits		
Spring Semester		
MECH4000	MECHANICAL VIBRATION	3
MECH4200	SIMULATION BASED DESIGN	4
MECH5000	MECHANICAL ENGINEERING CAPSTONE ANALYSIS	3
Technical Elective		3
HSS Elective*		4
Credits		
Summer Semester		
MECH5500	MECHANICAL ENGINEERING CAPSTONE PROJECT	4
Technical Elective		3
HSS Elective*		4
General Elective		3
Credits		
Total Credits		
128		

General and Technical Electives are selected in consultation with a Faculty Advisor

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences: HSSI, COMM, ECON, POLS, PSYC and SOCL
- The remaining course 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 20 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.

Of the three required Humanities and Social Science electives one of the Humanities electives must be in the area of Ethics and one of the Social Science electives must be in the area of Economics

THE SCHOOL OF MANAGEMENT

Ilyas Bhatti, Interim Dean

Annex South 001E

(617) -989-4804

John Cribbs, Associate Dean

Annex South 008A

(617) -989-4909

Vision

Our vision is to be influential leaders who prepare our students to become forward-thinking, inspired managers, innovative problem solvers, and global industry leaders in the fields of business and construction.

Mission

The mission of the School of Management is to develop transformative, pioneering global industry leaders who are equipped to apply classroom and hands-on knowledge to the fields of business and construction. We prepare our students to provide analytical insights for business, design, and construction, as well as manage the built environment through technological innovation and by championing sustainability.

Construction Management

Professor

- Cristina Cosma, Ph.D.

Associate Professor

- Payam Bakhshi, Ph.D.
- Ilyas Bhatti, M.S.
- Farzam Maleki, Ph.D.
- Monica A. Snow, Ph.D.
- Thomas A. Taddeo, M.S.

Assistant Professor

- Sharon Brown, M.S.
- John Cribbs, Ph.D.
- William Kearney, M.S.
- Hariharan Naganathan, Ph.D.
- Afshin Pourmokhtarian, Ph.D.

Visiting Associate Professor

- Richard Christiano, M.Ed.

Visiting Assistant Professor

- Arlene Beth Marcus, J.D.
- Paul Salamone, M.S.

Construction Management Bachelor of Science

Leading to a 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.

The Bachelor of Science in Construction Management (BSCM) 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

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 with an average of no more than 30 students in lectures and an average of no more than 20 students in 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. These learning outcomes are aligned with the requirements for ACCE accreditation:

- 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 electronic-based technology to manage the construction process.
- Apply basic surveying techniques for construction layout and control.
- Understand construction risk management.
- Understand construction accounting and cost control.
- Understand construction quality assurance and control.
- Understand construction project control processes.
- Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process
- 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.
- Understand the role of the construction manager as a member of different multidisciplinary project teams

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 for information regarding the construction management electives.

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 (registrar@wit.edu) 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.

Course	Title	Credits
Freshman Year		
Fall Semester		
CONM1000	INTRODUCTION TO CONSTRUCTION MANAGEMENT, FACILITIES MANAGEMENT & REAL ESTATE DEVELOPMENT	3
CONM1200	BUILDING CONSTRUCTION	4
CHEM1000	CHEMISTRY OF THE BUILT ENVIRONMENT	4
MATH1000	COLLEGE MATHEMATICS	4
English Sequence		4
Credits		19
Spring Semester		
CONM1500	CONSTRUCTION GRAPHICS	3
CONM1600	HEAVY CONSTRUCTION EQUIPMENT	3
PHYS1000	COLLEGE PHYSICS I	4
MATH1500	Precalculus	4
English Sequence		4
Credits		18
Sophomore Year		
Fall Semester		
CONM2000	CONSTRUCTION SURVEYING	4
CONM2100	STATICS & STRENGTH OF MATERIALS	4
CONM2200	ESTIMATING	4
MGMT2700	FINANCIAL ACCOUNTING	3
HSS Elective		4
Credits		19
Spring Semester		
CONM2500	BUILDING SYSTEMS	4
CONM2600	WOOD & STEEL ANALYSIS & DESIGN	3
MATH1030	STATISTICS & APPLICATIONS	4
HSS Elective		4
Credits		15
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL) ((OPTIONAL))	0
Credits		0
Junior Year		
Fall Semester		
CONM3000	MATERIALS TESTING & QUALITY CONTROLS	4
CONM3100	CONSTRUCTION PROJECT MANAGEMENT	4

Course	Title	Credits
CONN3201	CONSTRUCTION PROJECT SCHEDULING	4
MGMT3000	MANAGING & LEADING ORGANIZATIONS	4
	Credits	16
Spring Semester		
COOP3500	COOP EDUCATION 1	0
	Credits	0
Summer Semester		
CONN3500	ADVANCED ESTIMATING & BID ANALYSIS	4
CONN3600	CONCRETE ANALYSIS & DESIGN	4
CONN3800	SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT	3
HSS Elective		4
	Credits	15
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	0
	Credits	0
Spring Semester		
CONN4000	CONSTRUCTION PROJECT CONTROL	3
CONN4100	CONSTRUCTION BUSINESS & FINANCE	4
CONN4200	CONSTRUCTION SAFETY & RISK MANAGEMENT	3
MGMT4100	POWER & LEADERSHIP IN ORGANIZATIONS	4
HSS Elective		4
	Credits	18
Summer Semester		
CONN4650	BUSINESS, CONSTRUCTION LAW & GOVERNMENT REGULATIONS	3
CONN5500	SENIOR PROJECT CONSTRUCTION MANAGEMENT	4
MGMT3600	LABOR RELATIONS	3
HSS Elective		4
	Credits	14
	Total Credits	134

Of the five humanities and social science electives, BSCM students must include the following **HSS Directed Electives**:

Course	Title	Credits
ECON4102	PRINCIPLES OF ECONOMICS	4
PSYC4552	INDUSTRIAL ORGANIZATION PSYCHOLOGY	4

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. A career in commercial real estate requires excellent communication skills, an 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 on average in each lecture and no more than 20 students on average 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.

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences; HSSI, COMM, ECON, POLS, PSYC, and SOCL
- The remaining course 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.

- 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 electronic-based technology to manage the construction process.
- Apply basic surveying techniques for construction layout and control.
- Understand construction risk management.
- Understand construction accounting and cost control.
- Understand construction quality assurance and control.
- Understand construction project control processes.
- Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
- 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.
- Understand the role of the construction manager as a member of different multidisciplinary project teams.

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.

Course	Title	Credits
Freshman Year		
Fall Semester		
CONN1000	INTRODUCTION TO CONSTRUCTION MANAGEMENT, FACILITIES MANAGEMENT & REAL ESTATE DEVELOPMENT	3
CONM1200	BUILDING CONSTRUCTION	4
CHEM1000	CHEMISTRY OF THE BUILT ENVIRONMENT	4
MATH1000	COLLEGE MATHEMATICS	4
English Sequence		4
	Credits	19
Spring Semester		
CMRE1500	PRINCIPLES OF COMMERCIAL REAL ESTATE	3
CONN1500	CONSTRUCTION GRAPHICS	3
MATH1500	Precalculus	4
PHYS1000	COLLEGE PHYSICS I	4
English Sequence		4
	Credits	18
Sophomore Year		
Fall Semester		
CMRE2000	REAL ESTATE INVESTMENT	3
CONN2100	STATICS & STRENGTH OF MATERIALS	4
Spring Semester		
CONM2200	ESTIMATING	4
MGMT2700	FINANCIAL ACCOUNTING	3
ECON4102	PRINCIPLES OF ECONOMICS	4
	Credits	18
Summer Semester		
CMRE2400	PROPERTY MANAGEMENT FOR CORPORATE REAL ESTATE	3
CONN2500	BUILDING SYSTEMS	4
MATH1030	STATISTICS & APPLICATIONS	4
HSS Elective		4
	Credits	15
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0
	Credits	0
Junior Year		
Fall Semester		
CMRE3000	REAL PROPERTY ANALYSIS	3
CONN3100	CONSTRUCTION PROJECT MANAGEMENT	4
CONN3201	CONSTRUCTION PROJECT SCHEDULING	4
MGMT3000	MANAGING & LEADING ORGANIZATIONS	4
	Credits	15
Spring Semester		
COOP3500	COOP EDUCATION 1	0
	Credits	0
Summer Semester		
CMFM2300	SPACE PLANNING	4
CMFM4200	ENERGY & SUSTAINABILITY	3
CMFM4600	PRINCIPLES OF REAL ESTATE FOR FACILITY MANAGERS	3
CONN3800	SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT	3
PSYC4552	INDUSTRIAL ORGANIZATION PSYCHOLOGY	4
	Credits	17
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	0
	Credits	0
Spring Semester		
CMRE4000	REAL PROPERTY SECURITIZATION	3
MGMT2065	INTRODUCTION TO ENTREPRENEURSHIP	3
MGMT4100	POWER & LEADERSHIP IN ORGANIZATIONS	4
MGMT4400	BUSINESS NEGOTIATION PRINCIPLES	3
HSS Elective		4
	Credits	17
Summer Semester		
CONN4650	BUSINESS, CONSTRUCTION LAW & GOVERNMENT REGULATIONS	3
CONN5500	SENIOR PROJECT CONSTRUCTION MANAGEMENT	4
MGMT3600	LABOR RELATIONS	3

Course	Title	Credits
HSS Elective		4
	Credits	14
	Total Credits	133

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences; HSSI, COMM, ECON, POLS, PSYC, and SOCL
- The remaining course 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**:

Course	Title	Credits
ECON4102	PRINCIPLES OF ECONOMICS	4
PSYC4552	INDUSTRIAL ORGANIZATION PSYCHOLOGY	4

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 on average in each lecture and no more than 20 students on average 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 electronic-based technology to manage the construction process.
- Apply basic surveying techniques for construction layout and control.
- Understand construction risk management.
- Understand construction accounting and cost control.
- Understand construction quality assurance and control.
- Understand construction project control processes.
- Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
- 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.
- Understand the role of the construction manager as a member of different multidisciplinary project teams

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 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.

Course	Title	Credits	Course	Title	Credits
CMFM4600	PRINCIPLES OF REAL ESTATE FOR FACILITY MANAGERS	3	HSS Elective		4
					14
Freshman Year			Credits		
Fall Semester			Senior Year		
CONM1000	INTRODUCTION TO CONSTRUCTION MANAGEMENT, FACILITIES MANAGEMENT & REAL ESTATE DEVELOPMENT	3	Fall Semester		
CONN1200	BUILDING CONSTRUCTION	4	COOP4500	COOP EDUCATION 2	0
CHEM1000	CHEMISTRY OF THE BUILT ENVIRONMENT	4			0
MATH1000	COLLEGE MATHEMATICS	4	Credits		
English Sequence		4	Spring Semester		
			CONM4200	CONSTRUCTION SAFETY & RISK MANAGEMENT	3
	Credits	19	MGMT3500	FINANCIAL MANAGEMENT	4
			MGMT4100	POWER & LEADERSHIP IN ORGANIZATIONS	4
Spring Semester			MGMT4400	BUSINESS NEGOTIATION PRINCIPLES	3
CMFM2400	PROPERTY MANAGEMENT	3	HSS Elective		4
CONN1500	CONSTRUCTION GRAPHICS	3			
MATH1500	Precalculus	4	Credits		
PHYS1000	COLLEGE PHYSICS I	4	Summer Semester		
English Sequence		4	CMFM5500	CAPSTONE PROJECT IN FACILITY MANAGEMENT	4
	Credits	18	CONM4650	BUSINESS, CONSTRUCTION LAW & GOVERNMENT REGULATIONS	3
Sophomore Year			MGMT3600	LABOR RELATIONS	3
Fall Semester			HSS Elective		4
CMFM3300	BUILDING OPERATIONS	3			
CONN2100	STATICS & STRENGTH OF MATERIALS	4	Credits		
CONN2200	ESTIMATING	4	Total Credits		133
MGMT2700	FINANCIAL ACCOUNTING	3			
HSS Elective		4	ENGL/HSS Note		
	Credits	18	Students are required to complete:		
Spring Semester					
CMFM3200	PROJECT MANAGEMENT FOR FACILITY MANAGERS	4			
CONN2500	BUILDING SYSTEMS	4			
MGMT1500	DECISION ANALYSIS FOR BUSINESS	4			
HSS Elective		4			
	Credits	16			
Summer Semester					
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0			
	Credits	0			
Junior Year					
Fall Semester					
CMFM4100	FACILITY ASSESSMENT & FORECAST	4			
CONN3100	CONSTRUCTION PROJECT MANAGEMENT	4			
CONN3201	CONSTRUCTION PROJECT SCHEDULING	4			
MGMT3000	MANAGING & LEADING ORGANIZATIONS	4			
	Credits	16			
Spring Semester					
COOP3500	COOP EDUCATION 1	0	Course	Title	Credits
	Credits	0	ECON4102	PRINCIPLES OF ECONOMICS	4
Summer Semester			PSYC4552	INDUSTRIAL ORGANIZATION PSYCHOLOGY	4
CMFM2300	SPACE PLANNING	4			
CMFM4200	ENERGY & SUSTAINABILITY	3			

Construction Management Master of Science

Leading to a Master of Science in Construction Management Degree

The Master of Science in Construction Management (MSCM) program at Wentworth Institute of Technology is designed to educate students in foundational, post graduate construction management principles combined with relevant industry related education. The program prepares students with experience in topics that are specific to advancing professional skills in administrative and executive leadership positions within design firms, construction companies, and related disciplines. Both thesis and non-thesis options are available, allowing for various 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 academic and teaching opportunities.

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.

- Program Outcome 1: 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,
 - Create effective and professional written communications
 - Apply critical thinking
 - Apply problem solving techniques
 - Apply research methods
- Program Outcome 2: Expose students to subject matter and industry experts and the latest technological and managerial/leadership advancements and their effects on the Construction Industry, and
 - Apply advanced communication technology
 - Understand risk management
 - Understand the principles of leadership in business
- Program Outcome 3: Prepare and develop students from related disciplines to advance into the field of Construction Management.
 - Apply decision making techniques
 - Apply professional ethics
 - Apply advanced construction management practices

The Graduate Program in Construction Management emphasizes integrating professional experience with Construction Management (CM) concepts. With an established MSCM program, the School of Management provides a curriculum with flexible course electives and three distinct and different degree tracks. This curriculum's vision is to give graduate students more flexibility to select their electives from the established MSCM curriculum, the facility management (MSFM), and the project management (MSPM) curriculum. Students will have the option to select one of the following tracks (*track declaration must be made and graduate faculty advisor notified of selection, prior to the start of the second semester of attendance in the MSCM program*); **Track 1 Coursework - 30 credit hours** (open for rolling admission Fall, Spring, and Summer), which focusses on pure graduate coursework only, **Track 2 Capstone Project - 30 credit hours** (Fall admission only), which contains an industry or research-focused project that serves as the culminating experience for the degree program, or **Track 3 Thesis - 30 credit hours** (Fall admission only) that include 6 credit hours in research thesis embedded across the final year. The program also allows full-time students to engage in an optional 1 credit Graduate Program Internship INTN6000 to gain hands-on experience in the construction industry (3 credits maximum during their tenure at Wentworth). Once a track has been declared by the student, any future changes to the plan of study must be approved via signature from their primary, graduate faculty advisor and the Dean's Office. **Note:** *Students without a CM-related, undergraduate degree (Civil Engineering, Architecture or Construction Management)* will be required to enroll in two pre-requisite courses, which are in addition to the standard 30 credit hour degree tracks outlined by program.

Track 1 Coursework		Credits	Course	Title	Credits
Course	Title				
Foundation courses: Required 9 credits		9	CONM7100	MODERN CONSTRUCTION DELIVERY METHODS	3
CONM7000	EXECUTIVE MANAGEMENT FOR CONSTRUCTION MANAGEMENT	3	CONM7200	CONSTRUCTION LAW	3
CONM7050	RESEARCH METHODOLOGY FOR CONSTRUCTION MANAGEMENT	3	CONM7250	CONFLICT RESOLUTION & NEGOTIATION FOR CONSTRUCTION MANAGEMENT	3
CONM7400	ADVANCED PROJECT CONTROLS	3	CONM7300	REAL ESTATE DEVELOPMENT	3
CONM Electives: Select a minimum of 9 credits from the following courses		9	CONM7500	INTERNATIONAL CONSTRUCTION	3
			CONM7800	GRADUATE SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT	4
CONM7100	MODERN CONSTRUCTION DELIVERY METHODS	3	MGMT & FMGT Electives: Select a maximum of 9 credits from the following courses		
CONM7200	CONSTRUCTION LAW	3	MGMT7025	PROJECT SCHEDULING & COST PLANNING	3
CONM7250	CONFLICT RESOLUTION & NEGOTIATION FOR CONSTRUCTION MANAGEMENT	3	MGMT7050	BUSINESS FINANCE & INVESTMENT	3
CONM7300	REAL ESTATE DEVELOPMENT	3	MGMT7125	RISK MANAGEMENT	3
CONM7500	INTERNATIONAL CONSTRUCTION	3	MGMT7225	PROJECT TEAM BUILDING & LEADERSHIP	3
CONM7800	GRADUATE SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT	3	MGMT7250	STRATEGIC FINANCIAL DECISION MAKING	3
MGMT & FMGT Electives: Select a maximum of 12 credits from the following courses		12	MGMT7425	MANAGING TROUBLED PROJECTS	3
MGMT7025	PROJECT SCHEDULING & COST PLANNING	3	MGMT7450	COMMUNICATION STRATEGIES	3
MGMT7050	BUSINESS FINANCE & INVESTMENT	3	MGMT7500	QUANTITATIVE METHODS IN FACILITY MANAGEMENT RESEARCH	3
MGMT7125	RISK MANAGEMENT	3	MGMT7525	GLOBAL & VIRTUAL PROJECT MANAGEMENT	3
MGMT7225	PROJECT TEAM BUILDING & LEADERSHIP	3	FMGT7000	PROJECT MANAGEMENT APPLICATIONS	3
MGMT7250	STRATEGIC FINANCIAL DECISION MAKING	3	FMGT7100	CONTEMPORARY ISSUES IN MANAGING TECHNOLOGY	3
MGMT7425	MANAGING TROUBLED PROJECTS	3	FMGT7200	ENERGY & SUSTAINABILITY	3
MGMT7450	COMMUNICATION STRATEGIES	3	FMGT7300	FACILITY OPERATIONS	3
MGMT7525	GLOBAL & VIRTUAL PROJECT MANAGEMENT	3	FMGT7800	GRADUATE SPECIAL TOPICS IN FACILITIES MANAGEMENT	4
FMGT7000	PROJECT MANAGEMENT APPLICATIONS	3	Total Credits		30
FMGT7100	CONTEMPORARY ISSUES IN MANAGING TECHNOLOGY	3	Track 3 Thesis		
FMGT7200	ENERGY & SUSTAINABILITY	3	Course	Title	Credits
FMGT7300	FACILITY OPERATIONS	3	Foundation Courses: Required 15 credits		
FMGT7800	GRADUATE SPECIAL TOPICS IN FACILITIES MANAGEMENT	3	CONM7000	EXECUTIVE MANAGEMENT FOR CONSTRUCTION MANAGEMENT	3
Total Credits 30		30	CONM7050	RESEARCH METHODOLOGY FOR CONSTRUCTION MANAGEMENT	3
Track 2 Capstone Project			CONM7400	ADVANCED PROJECT CONTROLS	3
Course	Title	Credits	CONM8900	CONSTRUCTION MANAGEMENT THESIS	6
Foundation courses: Required 12 credits			CONM Electives: Select a minimum of 9 credits from the following courses		
CONM7000	EXECUTIVE MANAGEMENT FOR CONSTRUCTION MANAGEMENT	3	CONM7100	MODERN CONSTRUCTION DELIVERY METHODS	3
CONM7050	RESEARCH METHODOLOGY FOR CONSTRUCTION MANAGEMENT	3	CONM7200	CONSTRUCTION LAW	3
CONM7400	ADVANCED PROJECT CONTROLS	3	CONM7250	CONFLICT RESOLUTION & NEGOTIATION FOR CONSTRUCTION MANAGEMENT	3
CONM8000	CAPSTONE PROJECT IN CONSTRUCTION MANAGEMENT	3	CONM7300	REAL ESTATE DEVELOPMENT	3
CONM Electives: Select a minimum of 9 credits from the following courses					

Course	Title	Credits
CONM7500	INTERNATIONAL CONSTRUCTION	3
CONM7800	GRADUATE SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT	4
MGMT & FMGT Electives: Select a maximum of 6 credits from the following courses		
MGMT7025	PROJECT SCHEDULING & COST PLANNING	3
MGMT7050	BUSINESS FINANCE & INVESTMENT	3
MGMT7125	RISK MANAGEMENT	3
MGMT7225	PROJECT TEAM BUILDING & LEADERSHIP	3
MGMT7250	STRATEGIC FINANCIAL DECISION MAKING	3
MGMT7425	MANAGING TROUBLED PROJECTS	3
MGMT7450	COMMUNICATION STRATEGIES	3
MGMT7525	GLOBAL & VIRTUAL PROJECT MANAGEMENT	3
FMGT7000	PROJECT MANAGEMENT APPLICATIONS	3
FMGT7100	CONTEMPORARY ISSUES IN MANAGING TECHNOLOGY	3
FMGT7200	ENERGY & SUSTAINABILITY	3
FMGT7300	FACILITY OPERATIONS	3
FMGT7800	GRADUATE SPECIAL TOPICS IN FACILITIES MANAGEMENT	4
Total Credits		30

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.

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.

The Facility Management Master of Science degree program consists of 30 credits of electives comprised of a minimum of 18 credits of FMGT courses at the graduate level and a maximum of 12 credits in MGMT and COMN courses at the graduate level.

Total credits for degree: 30 credits

Course	Title	Credits
Select a minimum of 18 credits in FMGT courses at the graduate-level		
FMGT7000	PROJECT MANAGEMENT APPLICATIONS	3
FMGT7100	CONTEMPORARY ISSUES IN MANAGING TECHNOLOGY	3
FMGT7200	ENERGY & SUSTAINABILITY	3
FMGT7300	FACILITY OPERATIONS	3
FMGT7800	GRADUATE SPECIAL TOPICS IN FACILITIES MANAGEMENT ¹	4
FMGT8000	FACILITY MANAGEMENT CAPSTONE	3

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. 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.

Course	Title	Credits
A maximum of 12 credits of CONM or MGMT electives at the graduate-level		12
TOTAL CREDITS		30
FMGT8900	FACILITY MANAGEMENT THESIS	6
TOTAL CREDITS with Optional Thesis		36

¹ School Approval required

Construction Management Minor

The Construction Management minor (MCON) 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:

Course	Title	Credits
CONN1200	BUILDING CONSTRUCTION	4
CONN1500	CONSTRUCTION GRAPHICS	3
CONN2200	ESTIMATING	4
CONN3100	CONSTRUCTION PROJECT MANAGEMENT	4
CONN3201	CONSTRUCTION PROJECT SCHEDULING	4
Total Credits		19

Construction Manufacturing Minor

The Construction Manufacturing Minor (MCMG) is designed to expose students to controlled, manufacturing environments for the construction of built systems and components. The coursework provides an understanding of barriers related to prefabrication, preassembly, modularization, and off-site fabrication (PPMOF) construction practices, which are rapidly becoming standard practice for complex vertical construction projects. Concepts related to basic manufacturing processes, tolerance analysis and ANSI standards for manufacturing will be covered, along with effective personnel management and economic strategies for successfully operating off-site construction ventures.

Course	Title	Credits
MANF1000	MANUFACTURING PROCESSES	4
MANF2000	COMPUTER AIDED MANUFACTURING	3
CONN2500	BUILDING SYSTEMS	4
MECH2300	ENGINEERING GRAPHICS	3
PSYC4552	INDUSTRIAL ORGANIZATION PSYCHOLOGY	4
ECON ELECTIVE		3 OR 4
Total Credits		21-22

Facilities Management Professional Certificate

Student Learning Outcomes

Earning a Facilities Management professional certificate from Wentworth enables students to:

- Be eligible for 19 credits toward our Bachelor of Science in Project Management
- Prepare for the Certified Facilities Manager exam, which offers a competitive career advantage
- Master the fundamentals of handling financial resources for facilities management
- Gain valuable leadership and project management skills

Wentworth's Facilities Management professional certificate 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 them to rapidly advance their career in facilities management.

The professional certificate in Facilities Management (CPFM) is awarded upon successful completion of the required six (6) courses. Each course carries 3 or 4 credits. Throughout the program, students will enjoy access to all of Wentworth's resources and support services, including the library, academic advising, career counseling and technical support. Additionally, all the courses transfer into the Bachelor of Science in Project Management degree.

Course	Title	Credits
Required Courses		
BLDG1900	BASIC BUILDING SERVICES	4
CPFM2000	INTRODUCTION TO FACILITY MANAGEMENT	3
CPFM3200	PROJECT MANAGEMENT FOR FACILITY MANAGERS	3
CPFM4100	FACILITY ASSESSMENT & FORECASTING	3
CPFM4200	ENERGY & SUSTAINABILITY	3
CPFM4600	PRINCIPLES OF REAL ESTATE & PROJECT MANAGEMENT	3
Total Credits		19

Managing Construction Projects Professional Certificate

Student Learning Outcomes

Earning a Managing Construction Projects professional certificate from Wentworth enables students to:

- Be eligible for up to 20 credits toward our bachelor's degree program in Project Management.
- Build core competencies in management theory, estimating, scheduling, control, contracts and codes.

- Gain valuable leadership skills to advance your construction career.
- Prepare for project management and related positions in private, non-profit and government sectors.

Wentworth's Managing Construction Projects professional certificate is designed for individuals who are interested in transitioning into a management-focused position in the construction industry. The professional certificate in Managing Construction Projects (CMPC) is awarded upon successful completion of the required five (5) courses. Throughout the program, students will enjoy access to all of Wentworth's resources and support services, including the library, academic advising, career counseling and technical support. Additionally, all the courses transfer into the Bachelor of Science in Project Management degree.

Course	Title	Credits
Required Courses		
BLDG1015	DRAWINGS & SPECIFICATIONS	4
BLDG1500	COST ESTIMATING	4
BLDG3200	PLANNING & SCHEDULING	4
BLDG3450	CONSTRUCTION PROJECT COST ANALYSIS	4
BLDG3600	CONSTRUCTION MANAGEMENT THEORY	4
Total Credits		20

Management

Professor

- Seyed Noorian, M.B.A.
- Cindy P. Stevens, Ph.D.
- Frederick Trilling, J.D.

Associate Professor

- Susan Duffy, Ph.D.
- Hollis Greenberg, M.B.A.
- Michael Mozill, M.B.A.

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, Entrepreneurship, or Cybersecurity Management. 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 School of Management. In the spring semester of the senior year, seniors register for their final graded portfolio assessment.

Program Educational Objectives

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.

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, Entrepreneurship, or Cybersecurity Management as part of the degree requirements.

Course	Title	Credits
Freshman Year		
Fall Semester		
MGMT1000	INTRODUCTION TO MANAGEMENT	4
MGMT1025	COMPUTER BUSINESS APPLICATIONS	4
MATH1040	APPLIED MATHEMATICS FOR BUSINESS	4
English Sequence		4
	Credits	16
Spring Semester		
MGMT1500	DECISION ANALYSIS FOR BUSINESS	4
MGMT2750	INTEGRATIVE FINANCIAL ACCOUNTING	4
Science Elective		4
English Sequence		4
	Credits	16
Sophomore Year		
Fall Semester		
MGMT2000	MANAGEMENT INFORMATION SYSTEMS	4
MGMT2100	MANAGEMENT COMMUNICATIONS	4
MGMT2200	RESEARCH METHODS IN BUSINESS	4

Course	Title	Credits	
HSS Elective		4	Students are required to complete:
	Credits	16	<ul style="list-style-type: none"> At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL At least one course in the Social Sciences; HSSI, COMM, ECON, POLS, PSYC, and SOCL The remaining course from either the Humanities or Social Sciences category.
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	Students with a three English course sequence may use the third English course to satisfy a Humanities requirement.
	Credits	18	
Summer Semester			A minimum of 28 credits total, including English, humanities, and social science credit, is required to complete the humanities and social sciences graduation requirement.
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0	
	Credits	0	
Junior Year			Of the six humanities and social science electives, BSM students must include the following HSS Directed Electives :
Fall Semester			
MGMT3000	MANAGING & LEADING ORGANIZATIONS	4	
MGMT3650	BUSINESS LAW	4	
MGMT Elective Concentration Course II		3	
General Elective		3	
HSS Elective		4	An Ethics elective
	Credits	18	
Spring Semester			Project Management, Entrepreneurship, or Cybersecurity Management Concentrations (Optional)
COOP3500	COOP EDUCATION 1	0	Project Management Concentration Courses
	Credits	0	Complete the following courses:
Summer Semester			
MGMT3500	FINANCIAL MANAGEMENT	4	
MGMT3700	HUMAN RESOURCES & LABOR MANAGEMENT	3	
MGMT3900	OPERATIONS MANAGEMENT	4	
MGMT Elective Concentration Course III		4	
HSS Elective		4	
	Credits	19	
			Total Credits 14
Senior Year			
Fall Semester			Entrepreneurship Concentration Courses
COOP4500	COOP EDUCATION 2		Complete the following courses:
	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	18	
Summer Semester			
MGMT3360	INTERNATIONAL BUSINESS	3	
MGMT5500	SENIOR PROJECT	4	
MGMT Elective		3	
HSS Elective		4	
	Credits	14	
	Total Credits	135	
			Cybersecurity Management Concentration Courses
			Complete the following courses:
	Course	Title	Credits
	COMP2500	SECURITY PRINCIPLES	4
	MGMT2560	CYBERSECURITY LAW AND POLICY	3
	MGMT2650	CYBERSECURITY PLANNING	3
	MGMT2800	CYBERSECURITY MANAGEMENT	4
	Total Credits	14	

ENGL/HSS Note

Project Management Bachelor of Science

Leading to a 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.

Student Learning 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: 127

Course	Title	Credits
Freshman Year		
Fall Semester		
MGMT1025	COMPUTER BUSINESS APPLICATIONS	4
MATH1040	APPLIED MATHEMATICS FOR BUSINESS	4
SCIENCE Elective w/ Lab		4
English Sequence		4
	Credits	16
Spring Semester		
MGMT1500	DECISION ANALYSIS FOR BUSINESS	4
MGMT2550	APPLIED PROJECT MANAGEMENT	4
MANAGEMENT or TECHNICAL Elective		4
English Sequence		4
	Credits	16
Sophomore Year		
Fall Semester		
MGMT2100	MANAGEMENT COMMUNICATIONS	4
MGMT3300	PROJECT PLANNING, SCHEDULING & CONTROL	4
MATH1030	STATISTICS & APPLICATIONS	4
HSS Elective		4
	Credits	16
Spring Semester		
MGMT2500	SYSTEMS ANALYSIS & DESIGN	3

Course	Title	Credits
MGMT3500	FINANCIAL MANAGEMENT	4
MGMT3560	GROUP PROCESSES & TEAM BUILDING	4
HSS Elective		4
Credits		15
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	
Credits		0
Junior Year		
Fall Semester		
MGMT2200	RESEARCH METHODS IN BUSINESS	4
MGMT2750	INTEGRATIVE FINANCIAL ACCOUNTING	4
MANAGEMENT or TECHNICAL Elective		3
GENERAL Elective		3
HSS Elective		4
Credits		18
Spring Semester		
COOP3500	COOP EDUCATION 1	
Credits		0
Summer Semester		
MGMT2850	PRINCIPLES OF MARKETING	4
MGMT3160	PROJECT RISK	4
MANAGEMENT or TECHNICAL Elective		4
HSS Elective		4
Credits		16
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	
Credits		0
Spring Semester		
MGMT3000	MANAGING & LEADING ORGANIZATIONS	4
MGMT3750	PROJECT EVALUATION & PERFORMANCE	3
MANAGEMENT or TECHNICAL Elective		4
HSS Elective		4
Credits		15
Summer Semester		
MGMT5500	SENIOR PROJECT	4
MANAGEMENT or TECHNICAL Elective		4
MANAGEMENT or TECHNICAL Elective		4
GENERAL Elective		3
Credits		15
Total Credits		127

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences; HSSI, COMM, ECON, POLS, PSYC, and SOCL
- The remaining course 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.

Computer Information Systems Bachelor of Science

Leading to a Bachelor of Science Degree in Computer Information Systems

The B.S. in Computer Information Systems (BSIS) 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.

Program Educational Objectives

Graduates will be well prepared for the growing number of opportunities in CIS and information technology.

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.

Course	Title	Credits
Freshman Year		
Fall Semester		
MGMT1025	COMPUTER BUSINESS APPLICATIONS	4
MGMT1000	INTRODUCTION TO MANAGEMENT	4
MATH1000	COLLEGE MATHEMATICS	4
English Sequence		4
	Credits	16
Spring Semester		
COMP1000	COMPUTER SCIENCE I	4
MGMT2000	MANAGEMENT INFORMATION SYSTEMS	4
MATH2800	FINITE MATH	4
English Sequence		4
	Credits	16
Sophomore Year		
Fall Semester		
COMP1050	COMPUTER SCIENCE II	4
MGMT1500 or MATH1030	DECISION ANALYSIS FOR BUSINESS or STATISTICS & APPLICATIONS	4
MGMT2100	MANAGEMENT COMMUNICATIONS	4
COMP1100	INTRODUCTION TO NETWORKS	4
	Credits	16
Spring Semester		
COMP2650	DATABASES	4
MGMT2500	SYSTEMS ANALYSIS & DESIGN	3
MGMT2550	APPLIED PROJECT MANAGEMENT	4
MATH1900	INTRODUCTION TO OPERATIONS RESEARCH	4
HSS Elective		4
	Credits	19
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0
	Credits	0
Junior Year		
Fall Semester		
COMP2500	SECURITY PRINCIPLES	4
MGMT2750	INTEGRATIVE FINANCIAL ACCOUNTING	4
MGMT3060	TECHNOLOGY ACQUISITION	3
MGMT Elective		4
HSS Elective		4
	Credits	19
Spring Semester		
COOP3500	COOP EDUCATION 1	0
	Credits	0
Summer Semester		
MGMT2850	PRINCIPLES OF MARKETING	4
MGMT3650	BUSINESS LAW	4
HSS Elective		4
Science Elective Lab Science		4
	Credits	16

Course	Title	Credits	ERP, and Virtual Project Management, will give students a competitive advantage in today's rapidly changing project management environment.
Senior Year			
Fall Semester			
COOP4500	COOP EDUCATION 2	0	
	Credits	0	Topics covered in the MSPM include:
Spring Semester			
MGMT3000	MANAGING & LEADING ORGANIZATIONS	4	<ul style="list-style-type: none"> • Communications strategies • Technology project management • Leadership • Leveraging technical innovation and intellectual property • Accounting and finance • New product development and commercialization • Global operations
MGMT3500	FINANCIAL MANAGEMENT	4	
COMP Elective		4	
HSS Elective		4	
	Credits	16	
Summer Semester			
MGMT3100	E-COMMERCE	4	
COMP Elective		4	
HSS Elective		4	
MGMT5510	CIS SENIOR PROJECT	4	
	Credits	16	
	Total Credits	134	

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences; HSSI, COMM, ECON, POLS, PSYC, and SOCL
- The remaining course 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, BSIS students must include the following **HSS Directed Electives**:

- ECON4102 PRINCIPLES OF ECONOMICS
- An Ethics elective

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 fulltime or part-time program via hybrid or online modalities. The Master of Science in Project Management (MSPM) is designed for students and 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,

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

Total credits for degree: 30

Course	Title	Credits
Required Courses		
MGMT7025	PROJECT SCHEDULING & COST PLANNING	3
MGMT7125	RISK MANAGEMENT	3
MGMT7225	PROJECT TEAM BUILDING & LEADERSHIP	3
MGMT7325	AGILE PROJECT MANAGEMENT	3
MGMT7425 or MGMT7130	MANAGING TROUBLED PROJECTS EMERGENCY RISK MANAGEMENT	3
MGMT7450	COMMUNICATION STRATEGIES	3
MGMT7525	GLOBAL & VIRTUAL PROJECT MANAGEMENT	3
MGMT7625	MANAGING ERP SYSTEMS	3
MGMT7725	PORTFOLIO & PROGRAM MANAGEMENT	3

Course	Title	Credits
MGMT7825	M.S. PROJECT MANAGEMENT CAPSTONE	3

Plan of Study

This Program offers both online and hybrid modalities. Full-time students will meet with a graduate faculty advisor to plan a program of study which meets degree and credit-hour requirements for each semester. The following is a recommended part-time schedule for the MSPM Program:

Recommended Schedule: On-line (Part-time)

Course	Title	Credits
Year One		
Semester One		
MGMT7025	PROJECT SCHEDULING & COST PLANNING	3
MGMT7125	RISK MANAGEMENT	3
	Credits	6
Semester Two		
MGMT7225	PROJECT TEAM BUILDING & LEADERSHIP	3
MGMT7450	COMMUNICATION STRATEGIES	3
	Credits	6
Semester Three		
MGMT7325	AGILE PROJECT MANAGEMENT	3
MGMT7425	MANAGING TROUBLED PROJECTS	3
	Credits	6
Year Two		
Semester One		
MGMT7525	GLOBAL & VIRTUAL PROJECT MANAGEMENT	3
MGMT7625	MANAGING ERP SYSTEMS	3
	Credits	6
Semester Two		
MGMT7725	PORTFOLIO & PROGRAM MANAGEMENT	3
MGMT7825	M.S. PROJECT MANAGEMENT CAPSTONE	3
	Credits	6
Total Credits		
		30

Recommended Schedule: Hybrid (Full-time)

Course	Title	Credits
First Year		
Fall Semester		
Spring Semester		
MGMT7025	PROJECT SCHEDULING & COST PLANNING	3
MGMT7125 or MGMT7800	RISK MANAGEMENT or GRADUATE SPECIAL TOPICS IN MANAGEMENT	3
MGMT7225	PROJECT TEAM BUILDING & LEADERSHIP	3
MGMT7450	COMMUNICATION STRATEGIES	3
	Credits	12
Summer Semester		
MGMT7325	AGILE PROJECT MANAGEMENT	3
MGMT7425	MANAGING TROUBLED PROJECTS	3
MGMT7525	GLOBAL & VIRTUAL PROJECT MANAGEMENT	3
	Credits	9

Course	Title	Credits
Summer Semester		
MGMT7625	MANAGING ERP SYSTEMS	3
MGMT7725	PORTFOLIO & PROGRAM MANAGEMENT	3
MGMT7825	M.S. PROJECT MANAGEMENT CAPSTONE	3
	Credits	9
Total Credits		
		30

Business Analytics Master of Science Leading to a Master of Science Degree in Business Analytics

The Master of Science in Business Analytics is offered 100% online. Learn where it is convenient for you, and complete your degree in less than 1 year, full-time.

In addition, the program will draw on several disciplines to provide a well-rounded, flexible experience. Electives from a cross-section of disciplines and schools will be offered including Applied Mathematics, Computer Science & Networking, Management, and Sciences.

Program Educational Objectives

Hands-on, project-based learning opportunities will give you the skills and knowledge you need to derive data-driven insights. Learn how to prepare data-informed solutions to business-related challenges and implement actionable business strategies based on quantitative modeling. Master the use of data munging/management principles to extract, load, process, and transform real-world data. And understand the ethical consequences of data-informed decision-making and how to communicate data findings effectively.

Top off your experience with a capstone project, integrating what you've learned and the skills you've developed to solve real-world challenges.

Total credits for degree: 33 Credits

Recommended full-time course sequence:

Course	Title	Credits
Semester One		
DATA6100	DATA VISUALIZATION	3
MGMT6150	APPLIED BUSINESS ANALYTICS	3
DATA6200	DATA MANAGEMENT	3
	Credits	9
Semester Two		
DATA6900	CAPSTONE I	3
MGMT6200	QUANTITATIVE MANAGEMENT	3
MGMT6250	DATA-DRIVEN MARKETING	3
BUSINESS ANALYTICS ELECTIVE		3
	Credits	12
Semester Three		
DATA6950	CAPSTONE II	3
BUSINESS ANALYTICS ELECTIVE		3
BUSINESS ANALYTICS ELECTIVE		3

Course	Title	Credits	Course	Title	Credits
BUSINESS ANALYTICS ELECTIVE		3	MGMT3650	BUSINESS LAW	4
Credits		12	MGMT3700	HUMAN RESOURCES & LABOR MANAGEMENT	3
Total Credits		33	MGMT4400	BUSINESS NEGOTIATION PRINCIPLES	3

Recommended part-time course sequence:

Course	Title	Credits
Year One		
Semester One		
DATA6100	DATA VISUALIZATION	3
MGMT6150	APPLIED BUSINESS ANALYTICS	3
Credits		6
Semester Two		
MGMT6200	QUANTITATIVE MANAGEMENT	3
MGMT6250	DATA-DRIVEN MARKETING	3
Credits		6
Semester Three		
BUSINESS ANALYTICS ELECTIVE		3
BUSINESS ANALYTICS ELECTIVE		3
Credits		6
Year Two		
Semester One		
DATA6200	DATA MANAGEMENT	3
Credits		3
Semester Two		
BUSINESS ALALYTICS ELECTIVE		3
DATA6900	CAPSTONE I	3
Credits		6
Semester Three		
BUSINESS ANALYTICS ELECTIVE		3
DATA6950	CAPSTONE II	3
Credits		6
Total Credits		33

Electives may include subjects such as Behavior Analytics and Risk Management.

Business Management Minor

The Business Management minor (MBSM) has three (3) options. 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	4
MGMT2850	PRINCIPLES OF MARKETING	4
Select one of the following options:		6-7
Option 1: General Business		
MGMT2500	SYSTEMS ANALYSIS & DESIGN	3

Business Analytics Minor

The Business Analytics minor (MBAM) 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		4
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 academic units		16
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
COMM4335	SEE IT AND SAY IT WITH DATA VIZ	4
PHIL4525	VIRTUAL ETHICS	4
Management		
ECON4152	MACROECONOMICS (Management)	4
MGMT1500	DECISION ANALYSIS FOR BUSINESS	4
MGMT2000	MANAGEMENT INFORMATION SYSTEMS	4
MGMT2500	SYSTEMS ANALYSIS & DESIGN	3
Total Credits		20

Cybersecurity Management Minor

The Cybersecurity Management minor (MCY) 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
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

Project Management Professional Certificate

The Project Management Professional certificate (CPPM) at Wentworth Institute of Technology is designed for part-time students and is offered exclusively online to provide 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.

Student Learning Outcomes

Earning a Project Management Professional certificate from Wentworth enables students 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 professional certificate in Project Management is awarded upon successful completion of the required six (6) courses.

Course	Title	Credits
Required Courses		
MGMT1010	INTRODUCTION TO PROJECT MANAGEMENT	4
MGMT2100	MANAGEMENT COMMUNICATIONS	4
MGMT2300	ORGANIZATIONAL BEHAVIOR	3
MGMT2600	PROJECT RISK MANAGEMENT	3
MGMT3300	PROJECT PLANNING, SCHEDULING & CONTROL	4
MGMT3750	PROJECT EVALUATION & PERFORMANCE	3
Total Credits		21

THE SCHOOL OF SCIENCES AND HUMANITIES

Thaddeus Guldbrandsen, Dean

Beatty Hall 409

(617)- 989 - 4387

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.

Mission

The School of Sciences and Humanities is essential to the education of all students at Wentworth Institute of Technology. Our school 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.

Humanities & Social Sciences

Humanities and Social Sciences plays a crucial role in the Wentworth undergraduate experience. The goal of the disciplines our students study is to use design, engineering, and technology to make life "better." The purpose of Humanities and Social Sciences is to help students define "better" by identifying a set of values that will help them exercise integrity, vision, community involvement, and knowledge of self and other. Students must understand the application of their discipline to contemporary issues, they must acquire strong communication, interdisciplinary and team-building skills, and they must understand the definitions of leadership, personal responsibility, creativity, and professionalism.

The Humanities and Social Sciences curriculum provides students the opportunity to explore and master critical-thinking skills, essential for the basis of lifelong learning. Innovative problem-solving skills develop when students engage in a wide variety of learning opportunities and challenges, such as are offered by this academic unit.

To ensure consistency of academic rigor across the curriculum, all Humanities and Social Science electives will require students to write an average of 20 pages during the course of the semester and read an average of 40 pages per week.

The curriculum begins with the student's placement into an English sequence, the purpose of which is to instill in our students the skills necessary to communicate, both orally and in writing, in their classes, in the workplace, and in their communities. Subsequent courses consist of a wide variety of humanities and social science electives that introduce students to the concepts of community, society, and self.

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, all undergraduate students will be required to complete one of the following English sequences:

Course	Title	Credits
ENGL1100 & ENGL2200	ENGLISH I and ENGLISH II	8
ENGL0900 & ENGL1100 & ENGL2200	ENGLISH LANGUAGE SKILLS and ENGLISH I and ENGLISH II	12
ENGL0700 & ENGL0800 & ENGL1100	ENGLISH AS A SECOND LANGUAGE I (COMP) and ENGLISH AS A SECOND LANGUAGE II (LIT & COMP) and ENGLISH I	12
ENGL0800 & ENGL1100 & ENGL2200	ENGLISH AS A SECOND LANGUAGE II (LIT & COMP) and ENGLISH I and ENGLISH II	12

Humanities and Social Sciences Elective Requirement

Students in the School of Engineering and the School of Computing and Data Science are required to complete a minimum of 20. Students in the School of Management, School of Architecture and Design and the School of Sciences and Humanities are required to complete a minimum of 28 credits of Humanities and Social Science courses, comprised of the English sequence and either three or five electives in humanities and social science courses, with at least one course from the humanities and one course from the social sciences determined on the total number of credits required for each degree program.

- Students whose English Sequence requires three English courses may use the third English course to satisfy a humanities 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.

Professor

- Ronald Bernier, Ph.D.
- Leon L. Cort, Ph.D.
- Christopher S. Gleason, Ph.D.
- Thaddeus Guldbrandsen, Ph.D.
- Gloria Monaghan, M.A.

Associate Professor

- David J. Downey, M.A.
- Lizzie Falvey, Ph.D.
- Jody Michael Gordon, Ph.D.
- Ella Howard, Ph.D.
- Allison Lange, Ph.D.
- Juval V. Racelis, Ph.D.
- Edward Rooney, M.F.A.
- Kristen Hudak Rosero, Ph.D.
- Cynthia Williams, Ph.D.

Assistant Professor

- Paul Firenze, Ph.D.
- Mark John Isola, Ph.D.
- Faith Litchock-Morellato, M.A.T.
- Jelena Nikolic, Ph.D.
- Adam Payne, Ed.D.
- Allen W. Wong, Ph.D.

Visiting Assistant Professor

- Danica Buckley, M.A.
- Elizabeth Peterson, M.F.A.

American Studies Minor

The American Studies minor allows students to complete their Humanities and Social Science requirements through an interdisciplinary approach to the history and culture of the United States. Students use the tools of the Humanities and Social Sciences to explore the diversity of American culture, with attention to the roles of race, gender, sexuality, and socioeconomic class as informed by a larger global context.

Course	Title	Credits
Required Course:		4
HUMN4100	APPROACHES TO AMERICAN STUDIES	4
Elective Courses:		
Select three (3) courses from the following list: At least one course must be a social science course (Communications, Economics, Political Science, Psychology, Sociology)		12
COMM4300	MEDIA ETHICS	4
COMM4315	INTRODUCTION TO ADVERTISING	4
HIST4123	US HISTORY TO 1877	4
HIST4175	MODERN AMERICAN HISTORY	4
HIST4200	PICTURES, MEDIA & US POLITICS	4
HIST4223	BOSTON HISTORY	4
HIST4251	THE CIVIL WAR	4
HIST4271	HISTORY OF WORLD WAR II	4
HIST4300	AMERICAN URBAN HISTORY	4
HIST4451	HISTORY OF GENDER & SEXUALITY IN THE US	4
HUMN4053	MCCS STUDIO	4
HUMN4221	AMERICAN CINEMA AND AMERICAN CULTURE	4
HUMN4225	TELEVISION STUDIES	4
HUMN4230	STANDUP COMEDY IN AMERICA	4
HUMN4233	DECONSTRUCTING THE 20TH CENTURY	4
HUMN4245	TRANSCENDENTAL VISIONS	4
HUMN4263	ART & SOCIETY IN THE INDUSTRIAL AGE	4
HUMN4265	THE AMERICAN DREAM	4
HUMN4275	MYTH AMERICA: FROM COLONIES TO CULTURE WARS	4
HUMN4320	TOYS ARE U.S.: AMERICA AT PLAY	4
HUMN4345	HISTORY OF AMERICAN FOLK MUSIC	4
HUMN4355	BOSTON VOYAGES BY BOOK & FOOT	4

Course	Title	Credits
HUMN4501	9/11 LITERATURE AND FILM	4
LITR4351	CONTEMPORARY LITERATURE	4
LITR4451	AMERICAN LITERARY CLASSICS	4
LITR4651	SHORT FICTION	4
POLS4102	AMERICAN GOVERNMENT	4
POLS4300	RACE, CLASS & GENDER POLITICS	4
POLS4502	MEDIA & POLITICS	4
SOCL4302	CRIMINOLOGY & JUSTICE STUDIES	4
PSYC4160	SPORTS PSYCHOLOGY	4
SOCL4302	CRIMINOLOGY & JUSTICE STUDIES	4
SOCL4102	SOCIOLOGY	4
SOCL4252	FOOD IN AMERICAN HISTORY	4
SOCL4332	SOCIAL PROBLEMS	4
Total Credits		16

Computer Science and Society Bachelor of Science

Leading to a Bachelor of Science Degree in Computer Science and Society

Students in Computer Science + Society learn how to solve the world's problems using the skills of Computer Science and the frameworks of the Social Sciences and Humanities. Students gain a solid foundation in Computer Science as well as the interdisciplinary knowledge needed to understand and shape the role of technology in society. The major courses offer hands-on experience applying critical thinking, research, and data analysis skills to real-world problems drawn from a regional and global context. Electives allow students to tailor their studies to their interests and career plans. The program of study leads to a capstone project involving independent research. Students also apply these skills in the workplace through two required co-op work semesters.

Student Outcomes

Graduates of the major in Computer Science + Society should be able to:

1. Design, implement, and evaluate solutions to problems grounded in real-world scenarios by applying conceptual frameworks from the Humanities and Social Sciences and principles of Computer Science.
2. Analyze the interrelationship between scientific inquiry, technological innovation, cultural production, and human behavior.
3. Communicate effectively in a variety of professional contexts through use of critical argument, analyses, and creative expression in written, oral, visual, and/or digital output.
4. Make informed professional judgments based on ethical principles, social awareness, and cultural understanding.
5. Function effectively in collaborative environments.

Three Year Program

Total credits for degree: 120 credits

Course	Title	Credits
Freshman Year		
Fall Semester		
CSAS1000	INTRODUCTION TO COMPUTER SCIENCE + SOCIETY	4

Course	Title	Credits	Course	Title	Credits
COMP1000	COMPUTER SCIENCE I	4	CS+S ELECTIVE ¹		4
COMP1100	INTRODUCTION TO NETWORKS	4	CS+S ELECTIVE		4
MATH1500	PRECALCULUS ()	4	CS+S ELECTIVE		4
English Sequence		4	COMP Elective		4
	Credits	20		Credits	20
Spring Semester				Total Credits	120
COMP1050	COMPUTER SCIENCE II	4	¹ COMM4300,COMM4310, HIST4200, HUMN4200,HUMN4243,		
MATH1030	STATISTICS & APPLICATIONS	4	HUMN4263,HUMN4325,LITR4601, POLS4450,SOCL4102,SOCL4212		
MATH2300	DISCRETE MATHEMATICS	4	² PHIL4401, PHIL4525, PHIL4550, PHIL4600		
SCIENCE Elective w/Lab: BIOL, CHEM or PHYS		4	³ COMP3125, COMP3350 ,COMP3400, COMP3660,COMP3200		
English Sequence		4			
	Credits	20			
Summer Semester					
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)				
	Credits	0			
Sophomore Year					
Fall Semester					
COMP1200	COMPUTER ORGANIZATION	4	Freshman Year		
CSAS2000	COMPUTER SCIENCE + SOCIETY STUDIO (This course is required twice: Fall & Spring Sophomore year)	4	Fall Semester		
COMP2000	DATA STRUCTURES	4	CSAS1000	INTRODUCTION TO COMPUTER SCIENCE + SOCIETY	4
HSSI4000	SCIENCE, TECHNOLOGY & SOCIETY	4	COMP1000	COMPUTER SCIENCE I	4
SOCIAL SCIENCE RESEARCH METHODS		4	MATH1500	PRECALCULUS	4
	Credits	20	English Sequence		4
Spring Semester				Credits	16
COMP2350	ALGORITHMS	4	Spring Semester		
CSAS2000	COMPUTER SCIENCE + SOCIETY STUDIO (This course is required twice: Fall & Spring Sophomore year)	4	COMP1050	COMPUTER SCIENCE II	4
HIST4191	HISTORY OF TECHNOLOGY	4	MATH2300	DISCRETE MATHEMATICS	4
POLS4350	SCIENCE & TECHNOLOGY POLICY	4	SCIENCE Elective w/Lab: BIOL, CHEM or PHYS		4
CS+S ELECTIVE ¹		4	English Sequence		4
	Credits	20			
Summer Semester					
COOP3500	COOP EDUCATION 1		Sophomore Year		
	Credits	0	Fall Semester		
Junior Year			CSAS2000	COMPUTER SCIENCE + SOCIETY STUDIO (This course is required twice: Sophomore Fall & Junior Summer year)	4
Fall Semester			COMP1100	INTRODUCTION TO NETWORKS	4
ECON4200	TECHNOLOGY & ECONOMIC DEVELOPMENT	4	HSSI4000	SCIENCE, TECHNOLOGY & SOCIETY	4
ETHICS Elective ²		4	MATH1030	STATISTICS & APPLICATIONS	4
COMP2650	DATABASES	4		Credits	16
COMP Elective ³		4	Spring Semester		
GENERAL Elective		4	COMP1200	COMPUTER ORGANIZATION	4
	Credits	20	HIST4191	HISTORY OF TECHNOLOGY	4
Spring Semester			CS+S ELECTIVE ¹		4
COOP4500	COOP EDUCATION 2		CS+S ELECTIVE ¹		4
	Credits	0			
Summer Semester					
CSAS5000	COMPUTER SCIENCE + SOCIETY SENIOR PROJECT	4	Summer Semester		
			COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	
	Credits	0		Credits	0
Junior Year			Fall Semester		
Fall Semester			COMP2000	DATA STRUCTURES	4

Course	Title	Credits	Course	Title	Credits
COMP2650	DATABASES	4	HUMN4051	MEDIA CULTURE & COMMUNICATIONS	4
SOCIAL SCIENCE RESEARCH METHODS		4	HUMN4053	MCCS STUDIO	4
GENERAL Elective		4	Select three of the following electives:		12
	Credits	16	COMM4112	SOCIAL PERSPECTIVES JOURNALISM	
Spring Semester			COMM4205	APPLIED TECHNICAL COMMUNICATION	
COOP3500	COOP EDUCATION 1	0	COMM4210	INTRODUCTION TO COMMUNICATION THEORY	
Summer Semester			COMM4262	PUBLIC RELATIONS WRITING	
CSAS2000	COMPUTER SCIENCE + SOCIETY STUDIO (This course is required twice: Sophomore Fall and Junior Summer)	4	COMM4305	WEB ANALYTICS & MEDIA RESEARCH	
POLS4350	SCIENCE & TECHNOLOGY POLICY	4	COMM4310	MEDIA & INNOVATION MANAGEMENT	
COMP2350	ALGORITHMS	4	COMM4315	INTRODUCTION TO ADVERTISING	
CS+S ELECTIVE ¹		4	COMM4320	COMMUNICATION WITH PHOTOGRAPHY	
	Credits	16	COMM4325	COMMUNICATING WITH VIDEO	
Senior Year			HUMN3221	GLOBAL ADVENTURERS & EXPLORERS	
Fall Semester			HUMN4225	TELEVISION STUDIES	
COOP4500	COOP EDUCATION 2	0	HUMN4241	EXPLORING THE GRAPHIC NOVEL	
	Credits	0	HUMN4243	CONTEMPORARY ART & THEORY	
Spring Semester			HUMN4275	MYTH AMERICA: FROM COLONIES TO CULTURE WARS	
ECON4200	TECHNOLOGY & ECONOMIC DEVELOPMENT	4	HUMN4345	HISTORY OF AMERICAN FOLK MUSIC	
COMP Elective ³		4	HUMN4373	SHAKESPEARE ON FILM	
ETHICS Elective ²		4	SOCL4212	ART & TECHNOLOGY	
	Credits	12	Total Credits		20
Summer Semester			Special Topics courses in Humanities and Social Science (3800) when offered may satisfy one or more of the elective requirements ¹		
CSAS5000	COMPUTER SCIENCE + SOCIETY SENIOR PROJECT	4			
COMP Elective ³		4	¹ All 3800 courses will require a Course Substitution Form (https://wit.edu/ssc/forms/) submitted to the Registrar (registrar@wit.edu) to insure they are applied to the Media, Culture, and Communications Studies requirement/s. Contact the Humanities and Social Science academic unit for a list of courses available by semester.		
CS+S ELECTIVE ¹		4			
	Credits	12			
	Total Credits	120			

¹ COMM4300, COMM4310, HIST4200, HUMN4200, HUMN4243, HUMN4263, HUMN4325, LITR4601, POLS4450, SOCL4102, SOCL4212

² PHIL4401, PHIL4525, PHIL4550, PHIL4600

³ COMP3125, COMP3350, COMP3400, COMP3660, COMP3200

Media, Culture, and Communication Studies Minor

The Media, Culture, and Communication Studies minor (MCCS) allows students to complete their Humanities and Social Sciences requirement while exploring the role of the digital technologies in the study of contemporary culture.

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.

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 (<http://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

College Perf. Tech. for the Singing Actor, and the Simmons Concert Choir.

More information on the Colleges of the Fenway and the performing arts can be found at www.colleges-fenway.org/performingarts/performing-arts-academics/ (<http://www.colleges-fenway.org/performingarts/performing-arts-academics/>).

Science and Technology in Society Minor

The minor in Science and Technology in Society (MSTS) enables students to explore the broader social implications of their own fields of study, while fulfilling their Humanities and Social Science requirement by taking courses that focus on the interrelationship between scientific inquiry, technological innovation, and the societies that employ them.

Course	Title	Credits
Required course:		4
HSSI4000	SCIENCE, TECHNOLOGY & SOCIETY	4
Select four courses from the following list:		15-16
COMM4300	MEDIA ETHICS	4
COMM4305	WEB ANALYTICS & MEDIA RESEARCH	4
COMM4310	MEDIA & INNOVATION MANAGEMENT	4
ECON4200	TECHNOLOGY & ECONOMIC DEVELOPMENT	4
HIST4171	TECHNOLOGY & SOCIETY	3
HUMN4200	ROMAN CULTURE AND TECHNOLOGY	4
HUMN4243	CONTEMPORARY ART & THEORY	4
HUMN4263	ART & SOCIETY IN THE INDUSTRIAL AGE	4
HUMN4325	FROZEN! THE CLIMATE CRISIS OF 1816	4
LITR4601	SCIENCE FICTION AND FANTASY	4
PHIL4525	VIRTUAL ETHICS	4
POLS4350	SCIENCE & TECHNOLOGY POLICY	4
PHIL4550	BIOETHICS	4
PHIL4600	DESIGNING THE GOOD LIFE	4
POLS4450	INTERNATIONAL RELATIONS & SCIENCE FICTION	4
SOCL4102	SOCIOLOGY	4
SOCL4212	ART & TECHNOLOGY	4
Total Credits		19-20

Sustainability Minor (COF Only)

The COF Minor in Sustainability is embedded in the international recognition that unsustainable pressures, resulting from human activity, threaten the natural systems on which human existence depends. These pressures often impact the most vulnerable members of society. The minor encourages students to explore connections between their specific career-directed studies to issues of the natural world, finite resources and social justice. COF Sustainability Minor Courses can be located here (http://www.colleges-fenway.org/wp-content/uploads/2020/08/CSE-Courses_20-21.pdf).

The requirements are six academic courses:

- COF Environment Forum (to be taken twice) * *Students DO NOT cross-register for this course. This course can be located during your regular home registration as ENVM2000*
- *4 Elective Courses – students must take 4 courses that form a cohesive and thematic thread, selecting from at least two of the following categories*
 - Policy/Economics
 - Social Equity
 - Environmental

More information on the Colleges of the Fenway and the Sustainability (MSUS) minor can be found at <http://www.colleges-fenway.org/academics/center-for-sustainability-and-the-environment/cof-minor-in-sustainability/>.

Sciences

Professor

- Greg Sirokman, Ph.D.

Associate Professor

- Christopher Brigham, Ph.D.
- Malinda A. Stull, Ph.D.

Assistant Professor

- Mary Machado, Ph.D.
- Andrew Seredinski, Ph.D.
- David Simpson, Ph.D.
- Nadine Stecher, Ph.D.
- Keith Zengel, Ph.D.

Visiting Associate Professor

- Sucharita Sen-Banerjee, Ph.D.

Visiting Assistant Professor

- Stephen Adams, Ph.D.
- Shawn Eastwood, Ph.D.
- Taroshani Kasturiarachchi, Ph.D.
- Reyhani Ojani, Ph.D.
- Ngoc-Minh Phan-Lau, Ph.D.
- Kugabalasoorian Sanga, Ph.D.
- Veneta Tountcheva, 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: 128

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
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
COMP1000	COMPUTER SCIENCE I	4
PHYS1750	ENGINEERING PHYSICS II	4
	Credits	16
Spring Semester		
BIOL3000	APPLICATIONS IN GENETICS	4
CHEM3500	ORGANIC CHEMISTRY II	4
MATH2300	DISCRETE MATHEMATICS	4
HSS Elective		4
	Credits	16
Summer Semester		
COOP3000	PRE CO-OP WORK TERM (OPTIONAL)	0
	Credits	0

Junior Year

Fall Semester		
BIOL3200	CELL PHYSIOLOGY & SIGNALING	4

Course	Title	Credits
CHEM4200	ADVANCED LABORATORY TECHNIQUES IN CHEMISTRY	4
SCIN2000	SCIENTIFIC INSTRUMENTATION	4
HSS Elective		4
	Credits	16
Spring Semester		
COOP3500	COOP EDUCATION 1	0
	Credits	0
Summer Semester		
BIOL3100	MICROBIOLOGY	4
PHYS3100	MODERN PHYSICS	4
PHYS3500	THERMAL PHYSICS	4
HSS Elective		4
	Credits	16
Senior Year		
Fall Semester		
COOP4500	COOP EDUCATION 2	0
	Credits	0
Spring Semester		
BIOL4500	MOLECULAR NEUROBIOLOGY	4
CHEM3550	BIOCHEMISTRY	4
SCIN5000	SENIOR CAPSTONE I	4
HSS Elective		4
	Credits	16
Summer Semester		
CHEM3600	INORGANIC CHEMISTRY	4
SCIN5500	SENIOR CAPSTONE II	4
PHYS Elective, 3000 Level or higher		4
HSS Elective		4
	Credits	16
	Total Credits	128

ENGL/HSS Note

Students are required to complete:

- At least one course in Humanities: HSSI, HIST, HUMN, LITR and PHIL
- At least one course in the Social Sciences; HSSI, COMM, ECON, POLS, PSYC, and SOCL
- The remaining course 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.

Physics Elective

Course	Title	Credits
PHYS3600	CLASSICAL MECHANICS	4
PHYS3800	SPECIAL TOPICS IN PHYSICS	4

Course	Title	Credits	Course	Title	Credits
PHYS4500	INTRODUCTION TO QUANTUM MECHANICS	4	CHEM2990	INDEPENDENT STUDY IN CHEMISTRY	4
PHYS4700	ELECTRODYNAMICS	4	CHEM3500	ORGANIC CHEMISTRY II	4
			CHEM3550	BIOCHEMISTRY	4
			CHEM3600	INORGANIC CHEMISTRY	4
			CHEM3800	SPECIAL TOPICS IN CHEMISTRY (Renewable Energy)	4
			Total Credits		16

Biology Minor

The Biology minor (MBIO) 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, an intermediate level course, and two elective courses. At least one of the minor courses must be a research-based directed study.

Course	Title	Credits
Introductory Courses		
BIOL1100	CELL & MOLECULAR BIOLOGY	4
BIOL1700	ANATOMY & PHYSIOLOGY I	4
Intermediate Courses		
Select one (1) course		
BIOL1750	ANATOMY & PHYSIOLOGY II	4
BIOL2200	ADVANCED MOLECULAR BIOLOGY	4
Electives		
Select two (2) courses from the following list or complete the second Intermediate Level BIOL course to satisfy the Elective Requirement :		
BIOL2990	INDEPENDENT STUDY IN BIOLOGY ^{1,2}	4
BIOL3000	APPLICATIONS IN GENETICS	4
BIOL3800	SPECIAL TOPICS IN BIOLOGY ^{1,2}	4
Total Credits		20

¹ When offered as minor electives.

² May fulfill the directed research requirement. Please check with the Associate Dean for the School of Sciences and Humanities

Chemistry Minor

The Chemistry minor (MCHE) allows students to supplement their major with a focus on chemical interactions. 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.

Course	Title	Credits
Required Core Course		
CHEM1100	GENERAL CHEMISTRY I	4
Organic Chemistry Requirement		
Select one of the following:		
CHEM2000	BASICS OF ORGANIC & BIOCHEMISTRY	4
or CHEM2500	ORGANIC CHEMISTRY I	
Chemistry Electives		
Select two of the following:		
CHEM1600	GENERAL CHEMISTRY II	4
CHEM2200	PROTEINS MEDICINE & DISEASE	4

Physics Minor

The Physics minor (MPHY) allows students to supplement their major with a stronger foundation in the physical sciences. Students pursue study in advanced topics and apply the scientific method through directed research projects. These faculty led investigations provide the opportunity to further explore particular sub-fields of interest.

To earn the minor, students must pass two core courses and two elective courses.

Course	Title	Credits
Required Courses		
PHYS1250	ENGINEERING PHYSICS I	4
PHYS1750	ENGINEERING PHYSICS II	4
Electives		
Select two of the following:		
PHYS3000	COMPUTATIONAL PHYSICS	4
PHYS3100	MODERN PHYSICS	4
PHYS3800	SPECIAL TOPICS IN PHYSICS ^{1,2}	4
PHYS2990	INDEPENDENT STUDY IN PHYSICS ¹	4
Total Credits		16

¹ Eligibility of Special Topics courses may depend on topic. Please check with associate dean or instructor.

² All 3800 courses will require a Course Substitution Form (<https://wit.edu/ssc/forms/>) submitted to the Registrar (registrar@wit.edu) to insure they are applied to the Physics minor requirement/s. Contact the School of Sciences and Humanities for a list of courses available by semester

TRUSTEES AND ADMINISTRATION

Institute Administration

Office of the President

- Mark A. Thompson, President
- Erik Cote, Chief of Staff
- Amy M. Intille, Vice President and University Secretary
- Courtney L. McKenna, Interim Vice President of Student Affairs and Associate Vice President of Organization Development
- Johanna Sena, Director of Community and Government Relations

Office of the Provost & Academic Leadership

- Sophia Maggelakis, Senior Vice President and Provost
- Joseph Martel-Foley, Associate Provost for Academic Innovation
- Susan Duffy, Associate Provost for Transformational Learning and Partnerships
- Ilyas Bhatti, Interim Dean, School of Management
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- Thaddeus Guldbrandsen, Dean, School of Sciences and Humanities
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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

ARCH1200 ARCHITECTURAL REPRESENTATION

The course serves as an introduction to the means used to produce architecture. It introduces fundamental representation skills and analytical techniques that designers use to understand the built environment and to communicate design intentions. Student engage in sketching from observation, drawing (analog and digital), digital image making, and modeling techniques as tools for documentation, analysis, representation, and visual communication. (4 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; or INTD1000 and DSGN1100; or INDS1000 and DSGN1100 (6 credits) spring

ARCH1700 ARCHITECTURAL MEDIA

This course advances students' fundamental knowledge of various media and fabrication processes used to generate, manipulate, communicate and produce architecture today. Building upon the representational skills and analytical techniques studied in ARCH1200, this course develops student's ability to use a wide range of digital tools for representation, communication, analysis, design visualization and production, and fabrication in an architectural context. Students are introduced to principles of workflow in a digital design environment and learn to think critically about the appropriate choice of analog and/or digital tools.

Prerequisite: ARCH1200 or DSGN1000 (4 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 BUILDING MATTERS: MATERIALS & ELEMENTS OF CONSTRUCTION

This lecture and workshop-based course surveys common construction materials and their properties, as well as their use in simple and hybrid systems of assembly. Particular attention is devoted to wood, steel and masonry systems. This course also introduces students to structural principles guiding vernacular construction, principles of building siting and orientation, and passive environmental building strategies. This course is cross-listed with ARCH7300. **Corequisite:** ARCH2000 (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

This non-credit course is intended to prepare architecture students for their first coop experience in a professional design firm. It consists of two online, independent learning components: 1) an introduction to professional contract documents; and 2) an introduction to the Architectural Experience Program (AXP) of the National Council of Architectural Registration Boards (NCARB). Taken together, these two components provide structure and skills for students to compete in the job market and to succeed in the profession of architecture. (0 credit) spring

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 (6 credits) spring

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 ENERGY & RESOURCES IN ARCHITECTURE

This lecture and workshop-based course focuses on architectural methods for achieving visual, thermal and acoustical comfort in buildings using primarily non-mechanical means: climate, form, orientation, materials, and structure. Students will learn to analyze energy phenomena and understand energetic implications of a range of design strategies. Principles of sustainable resource management will be introduced. This course is cross-listed with ARCH7600. **Prerequisite:** ARCH2200 (4 credits) spring

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 and ARCH1700 (6 credits) fall

ARCH3200 PASSIVE & ACTIVE SYSTEMS

This lecture and workshop-based course focuses on architectural methods for achieving visual and thermal comfort in buildings using both passive and active systems. Lectures and assignments address lighting, optimization fire safety, water and waste, and envelope systems in buildings. This course emphasizes the integration of spatial, visual and environmental performance aspects of building systems in medium-to-large-scale structures, where such systems may be a determinant of architectural form. Innovative environmental solutions will be illustrated throughout the course. This course is cross-listed with ARCH8250.

Prerequisite: ARCH2700 (4 credits) fall

ARCH3400 STRUCTURES 01

In this course students learn how loads are applied and distributed, and how to analyze funicular structures, columns, beams, and trusses. Both the method of joints and the method of sections are used. Basic principles of strength of materials, structural mechanics and structural analysis are presented. **Prerequisites:** PHYS1000 or PHYS1250 (4 credits) spring

ARCH3500 STUDIO 06

This studio course explores architectural design through a series of problems increasing in scale, complexity and length throughout the semester. **Prerequisite:** ARCH2200, ARCH2700, ARCH3000, and ARCH3400; **Corequisite:** ARCH3200 and ARCH3900 (6 credits) summer

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 02

In this course students learn the structural properties of major construction materials and learn to design beams, slabs, columns and foundations in wood, steel and concrete. Topics include building codes and specifications, loads on structural systems, grids and pattern layouts, and soils and foundations. **Prerequisites:** ARCH3400 (4 credits) fall

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 TECHNOLOGIES)

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

ARCH4075 COLOR RELATIONSHIPS

This course introduces students to color theory. Through readings and exercises, students develop an understanding of how color relationships affect or perceptions of color. Works and writings by many artists are studied, with particular focus on the work of twentieth-century abstract expressionist painter and teacher Hans Hofmann. Using acrylic paint, students do a series of formal color exercises and painting projects throughout the semester, with a painting as the semester's final project. (4 credits) spring

ARCH4100 CONTEXT ANALYSIS

As an integral component of the Berlin Study Abroad program, this course is based on the exploration of a number of contemporary and historic buildings by prior research and on-site study during travels to European cities. Students will explore a range of selected projects in two or more cities traveled to during the term. to understand their design and the culture and context that influence the architects and their work. Projects will be explored and analyzed by online research, on-site observations and documentation. (4 credits) fall, spring

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:** ARCH3500 (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 BUILDING MATTERS

This lecture-and workshop-based course surveys common construction materials and their properties, as well as their use in simple and hybrid systems of assembly. Particular attention is devoted to wood, steel, and masonry systems. This course also introduces students to structural principles guiding vernacular construction, principles of building siting and orientation, and passive environmental building strategies. This course is cross-listed with ARCH2200. **Corequisite:** ARCH7000 (4 credits) fall

ARCH7325 SPACE, SKIN, AND SURFACE

This seminar examines the operational principles of displaying objects and actions through architecture, with a focus on the framework of space, skin, and surface. (4 credits)

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

ARCH7375 AFFORDABLE HOUSING | SUSTAINABLE COMMUNITIES

This seminar focuses on the political, financial, social, and design forces that influence the production of affordable housing, as well as the community agendas and development strategies that shape the outcome. Through readings and discussion, precedent studies, site visits, and guest speakers, students develop a detailed understanding of the principles of affordable housing development. Students also participate in the Affordable Housing Development Competition (AHDC), sponsored by the Federal Home Loan Bank of Boston, as an integral part of this elective. (4 credits)

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 ENERGY AND RESOURCES IN ARCHITECTURE

This lecture and workshop-based course focuses on architectural methods for achieving visual, thermal and acoustical comfort in buildings using primarily non-mechanical means: climate, form, orientation, materials, and structure. Students will learn to analyze energy phenomena and understand energetic implications of a range of design strategies. Principles of sustainable resource management will be introduced. This course is cross-listed with ARCH2700. **Prerequisite:** ARCH7300 or ARCH8000 (4 credits) spring

ARCH7675 THE CLIMATE - RESPONSIVE BUILDING

Global climate change is an increasingly pressing concern for engineers and designers. Buildings are responsible for a large percentage of global greenhouse gas emissions and other toxins that pollute our environment and create ecological crises of increasing severity. The effects of buildings are greater than transportation, agriculture, and other well-known impacts. This course is an exploration of climate-responsive design strategies, ecologically sensitive material choices, advanced building envelope design, equipment efficiencies, and renewable resources that will ameliorate those environmental impacts. (3 credits) summer

ARCH7800 GRADUATE 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 special topics course offerings. (1 - 4 Credits)

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 PASSIVE AND ACTIVE SYSTEMS

This lecture and workshop-based course focuses on architectural methods for achieving visual and thermal comfort in buildings using both passive and active systems. Lectures and assignments address lighting, thermal optimization, fire safety, water and waste, and envelope systems in buildings. This course emphasizes the integration of spatial, visual, and environmental performance aspects of building systems in medium-to-large-scale structures, where such systems may be a determinant of architectural form. Innovative environmental solutions will be illustrated throughout the course. This course is cross-listed with ARCH3200.

Corequisite: ARCH8000 (4 credits) fall

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 01

In this course students learn how loads are applied and distributed, and how to analyze funicular structures, columns, beams and trusses. Both the method of joints and the method of sections are used. Basic principles of strength of materials, structural mechanics, and structural analysis are presented. (4 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:** ARCH8300 (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

In this course students learn the structural properties of major construction materials and learn to design beams, slabs, columns, and foundations in wood, steel and concrete. Topics include building codes and specifications, loads on structural systems, grids and pattern layouts and soils and foundations. **Prerequisite:** ARCH8400 (4 credits) spring

ARCH8820 THEORIES OF PRACTICE

Over the past decades, architects have engaged a wide range of approaches to conceiving and making buildings, or more aptly, to forming the theories behind their practice of architecture. The seminar will study and critique architects whose work illustrates a broad spectrum of contemporary outlooks. Themes will be introduced relating to the transformation of the discipline of architecture—from drawing to materials to site strategies and other philosophical approaches. These themes will be investigated through case studies of modernist, postmodern, and contemporary architects in comparison to historically important architectural texts and treatises. The seminar will emphasize critical thinking and analytical skills through extensive readings, in-depth seminar discussions, and student presentations. It will help students formulate and critique methods—graphic, verbal, and written—to present theories of their own as they embark on their own careers in practice.

Prerequisites: ARCH9600 (4 credits)

ARCH9000 GLOBAL RESEARCH STUDIO

The studio addresses research topics and sites from a global perspective. Students frame an issue within a faculty-directed research and design agenda. During a ten-day travel period, students conduct site research and engage with on-site organizations and/or communities. Upon return, students generate design criteria and conduct design tests through an iterative process. (6 credits) fall

ARCH9200 METHODS OF HISTORY, THEORY & CRITICISM

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. **Corequisite:** ARCH9300 (4 credits) fall

ARCH9300 DESIGN AS RESEARCH

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 **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 or senior status in the B.S. Architecture program (4 credits)

ARCH9700 ADVANCED TOPICS IN CONTEMPORARY ARCHITECTURE

This course addresses topics relevant to graduate study. Readings, discussion and analytical projects address contemporary issues in the field. (4 credits) spring

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; (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 MATH1776 (4 credits) fall

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:** 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)

BIOE3025 BIOMATERIALS & TISSUE ENGINEERING

This course provides students with an introduction to biomaterials and tissue engineering for therapeutic and diagnostic use. The course will cover tissue organization and pathology, stem cell biology, biomaterial composition and properties and the design of tissue engineered constructs for tissue and organ replacement. The lab portion of this course will introduce students to aseptic tissue culture, 3D bioprinting and common techniques used to generate and assess tissue engineered constructs. **prerequisites:** BIOE2000 and CHEM2500 (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, BIOE2000 and ENGR1800 (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 provides a detailed overview of the important aspects of biomanufacturing and bioprocessing. Mass and energy balances related to biomanufacturing processes will be discussed, as well as the roles of thermodynamic properties in process control. The laboratory portion of this course will provide a hands-on introduction to several key aspects of real-time process control, such as temperature, flow and pH control. The importance of each of these techniques, more importantly the importance of carrying out each technique correctly and efficiently will be emphasized with "real-world" industrial examples offered as case studies. **Prerequisites:** BIOE2500 & CHEM1600 (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 semester schedule for the courses offered that semester. Contact the faculty assigned for more information about the course topic. (1 - 4 credits)

BIOE4000 CELL PHYSIOLOGY AND SIGNALING

This course focuses on cellular function and communication via chemical and electrical stimuli. Topics include membrane-bound and intracellular receptor proteins, cellular responses to receptor activation, specific signal transduction pathways, membrane potentials and transport physiology. Additionally, this course will introduce students to mathematical and computational modeling of receptor/ligand binding events and the associated physiologic responses. **Prerequisites:** BIOE2000, BIOL2200 & CHEM3550 (4 credits) spring

BIOE4100 STEM CELL BIOTECHNOLOGY AND REGENERATIVE MEDICINE

Over the last decade, regenerative medicine has made significant progress in the identification and use of novel therapeutic agents to treat degenerative disorders. This course will explore the state of the art in regenerative medicine by introducing students to stem cells, tissue engineering, and the clinical application of these therapeutic platforms. The regulatory concerns surrounding these technologies will also be discussed. The lab portion of this course will provide students with hands-on experience in the culture of stem cells and the characterization of stem cell phenotype and bioactivity. Ultimately, students will be responsible for designing and testing a biological assay to measure stem cell potency as a means to predict therapeutic function. **Prerequisite:** BIOE3025 (3 credits) summer

BIOE4400 SYNTHETIC BIOLOGY

This course provides a detailed overview of the important aspects of the emerging field of synthetic biology. The field of synthetic biology spans the boundaries of biology, chemistry and engineering with the goal of engineering biomolecular systems and cellular capabilities for a variety of applications. This course will cover three foundational parts of synthetic biology, including the biological background of gene regulation, experimental methods for genetic circuit construction and a mathematical basis of network modeling. Successful examples in biofuels, biomedicine and other areas will be discussed in detail to demonstrate the potential impact of the field in these application areas. **Prerequisite:** BIOE3500 (4 credits)

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 electrophysiology. Dynamics of mechanical flow for fluid and heat are introduced for cells, tissues and organ systems. Topics include fermentation processes in general; growth of bacteria, yeasts, animal and human cells; and mass transfer processes of the human body. **Prerequisites:** BIOE2000, BIOE2500 and MATH2500 (4 credits) summer

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, summer

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 academic unit 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 they utilize these principles; the natural ecology of microorganism; the human use of microorganism; and how microorganism function in disease. **Prerequisites:** 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

BIOL3550 ENVIRONMENTAL BIOLOGY FOR ENGINEERS

This course is an introduction to fundamental aspects of microbiology pertinent to Earth systems, an understanding of living cell structure, bioenergetics and metabolism and microbial genetics is applied to topics pertinent to environmental issues, such as: bioenergy; bioremediation; carbon, nitrogen and sulfur cycles; microbial ecology; disease and immunity; and molecular microbiology. This course will explore the use of microbes in biodegradation and as biocatalysts, as well as the molecular techniques used in these applications. Additionally, impacts of biogeochemical interfaces will be explored including, but not limited to nutrient cycling and limitation, biological redox processes, bio-active metals, controls of atmospheric carbon dioxide, carbon cycle models and others. Laboratory sessions give student hands-on experience in analytical and molecular methods. **Prerequisites:** CHEM1100 and ENGR1000 (4 credits)

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, anesthesia 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 is a course 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 DRAWINGS & SPECIFICATIONS

The development and interpretation of civil, architectural, structural, and electrical drawings; freehand sketching of construction details and sections; computer-aided construction drafting. (4 credits) summer

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 COST 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. Standard estimators' forms are prepared. Computer techniques and applications are also examined. (4 credits) summer

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 **Prerequisite:** BLDG1100 (4 credits)

BLDG3200 PLANNING & 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. (4 credits) spring

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 the academic unit 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 glycoses, 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 STATIC & 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 STATIC & 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: CIVE2000 (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 floatation, 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 and 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 CONN2000 (4 credits) fall

CIVE3200 STRUCTURAL ANALYSIS

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, 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. **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

The course applies principle of fluid mechanics to the design and analysis of hydraulic systems. The course emphasizes open channel flow and addresses topics of interest to the Civil Engineer. Topics include hydraulic grade line calculations, pump design, culvert analysis and design, non-uniform flow, gutters and inlets, water distribution, 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:** CIVE3200 (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:** CIVE4000 (4 credits) summer

CIVE7000 CONSTRUCTION ENGINEERING MANAGEMENT

This course presents principles and practices to effectively manage civil projects through all phases, including inception/concept, design, planning, construction commissioning and completion. Within this framework, students will learn the methodologies and tools necessary for each aspect of the process as well as the theories upon which these are built. Emphasis will be placed on estimating, life cycle cost analysis, financing structures, scheduling, value engineering, sustainability, project evaluation and project organization. (3 credits)

CIVE7200 SUSTAINABLE INFRASTRUCTURE

This course is an overview of sustainability engineering as it relates to infrastructure. Sustainable design principles will be assessed as they relate to urban planning, energy demand, water resources, transportation, building materials, and waste management. The course will include the review of the impact of infrastructure development on environmental management including water, storm water, energy, air quality, sprawl, and waste production, treatment, and storage. (3 credits)

CIVE7275 ENVIRONMENTAL BIOLOGICAL SYSTEMS

This course presents biological principles with an emphasis on biological processes in environmental engineering applications. Topics include aerobic and anaerobic microorganisms, biological wastewater processes, biological nutrients removal, disinfection, mechanisms and kinetics of biological reactions, and mass balances of biological reactors. The course will cover theory and practical applications using case studies. (3 credits)

CIVE7300 TRAFFIC ANALYSIS & SAFETY

Subjects include traffic capacity studies, traffic signals and control speeds studies, intersection analysis, traffic volume studies, sight distance evaluation, pedestrian facilities, multi-modal systems and traffic safety analysis. (3 credits)

CIVE7350 CONSTRUCTION OPERATIONS, METHODS & QUALITY CONTROL

This course imparts the knowledge and skills for students to achieve success in construction operations, methods and quality management systems (QMS) by understanding and evaluating civil engineering management principles as a formalized system that has documents, processes, procedures, and responsibilities in order to achieve quality policies and objectives. Topics in this course include the 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. (3 credits)

CIVE7375 CONTAMINANT FATE AND TRANSPORT

This course introduces the concepts of contaminant fate and transport processes in the environment, with consideration to exchanges across phase boundaries and the effects of reactions on environmental transport. Topics include equilibrium conditions at environmental interfaces; partitioning and distribution of contaminants in the environment; transport and exchange processes in surface water (dispersion and sorption); the movement of non-aqueous phase liquids in ground-water; and transport processes in the atmosphere. The level of coursework expects an undergraduate background in fluid mechanics, mass balances, and chemistry. (3 credits)

CIVE7450 TEMPORARY STRUCTURES

This course explores the design of temporary structures used in construction. Temporary structures include scaffolding, ground support systems, equipment bridges/trestles, concrete falsework and form work, cofferdams, and temporary support of existing structures. The focus is on safety and the engineering basics for the design of temporary structures. (3 credits)

CIVE7500 ADVANCED FOUNDATION ENGINEERING

In this course students' understanding of the principles and practices of foundation design are expanded beyond the basic introductory. In the first half of the course, students will learn many details and advanced applications related to the design of shallow foundations. During the second half, students will learn about numerous complex fundamentals inherent to the design of deep foundations. The level of coursework expects an undergraduate background in soil mechanics and foundation engineering. (3 credits)

CIVE7550 ADVANCED SOIL MECHANICS

This course focuses on the details of soil characteristics. It presents multiple soil-mechanics topics, including origin of soil, 1-D and 2-D flow through soil, settlement of soils due to excessive loading, shear strength of soil and stress paths, and stability of slopes. (3 credits)

CIVE7575 PHYSICAL & CHEMICAL TREATMENT PROCESSES

This course presents the physical and chemical principles for the treatment of dissolved and particulate contaminants in water and wastewater. These concepts will provide an understanding of the design of commonly used unit operations in treatment systems. Topics in the course include water characteristics, reactor dynamics/reaction kinetics, filtration, coagulation/flocculation, sedimentation, adsorption, disinfection, chemical oxidation, particulate removal, phase transfer processes, and redox processes. The level of coursework expects an undergraduate background in chemistry, physics, integral and differential calculus and an introductory course in environmental engineering at the undergraduate level. (3 credits)

CIVE7600 ADVANCED STEELE DESIGN

The course addresses advanced topics in structural steel design following the LRFD and AISC design specification. Structural steel topics included design of plate girders, composite steel members, and moment frames. Connection design will include bolted and welded connections using the instantaneous center approach, braced frame connections and moment frame connections. Seismic design of selected topics will also be addressed. The use of commercial software to verify student's design will be used to supplement the course. (3 credits)

CIVE7650 INFRASTRUCTURE RENEWAL

This course is designed for engineers and managers involved in infrastructure development, sustainability, and replacement. Topics include asset management, inspection, evaluation, maintenance, and renewal alternatives for waste collection and water distribution systems, surface and subsurface drainage, pavements, bridges, culverts, buildings, and other structures. (3 credits)

CIVE7675 WATER REUSE APPLICATIONS

This course focuses on the practical applications of water reuse in the built environment. Students will develop an understanding of water reclamation and reuse, regulations and guidelines, health risk analyses, and health and environmental considerations. The course will cover topics in satellite treatment systems, onsite and decentralized systems, distribution and storage of reclaimed water, irrigation and agricultural uses, industrial uses of reclaimed water, and environmental and recreational uses of reclaimed water. The level of coursework expects an undergraduate background in fluid mechanics, mass balances, and pumps. (3 credits)

CIVE7800 GRADUATE 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 special topics course offerings. (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. (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. (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)

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. (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 (I-shaped and box girders) and concrete (ASSHTO Standard I-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. (3 credits)

CIVE8900 DIRECTED PROJECTS

This course provides the opportunity to develop and complete an independent project in the student's area of specialty that incorporates knowledge, tools, and techniques developed in the program. Students will work with a professor in their subdiscipline to create a scope of work, review current standards and literature, and develop a paper or journal quality to potentially be submitted to a professional or research journal. (3 credits) fall, spring

Commercial Real Estate (CMRE)

CMRE1500 PRINCIPLES OF COMMERCIAL REAL ESTATE

This course provides an introduction to the areas of real estate markets, finance, valuation, urban economics and investments as related to construction. (3 credits) spring

CMRE2000 REAL ESTATE INVESTMENT

This course provides an introduction to real estate with a focus on investment and financing issues. Topics include, project evaluation, financing strategies, investment decision making, and real estate capital markets. (3 credits) fall

CMRE2400 PROPERTY MANAGEMENT FOR CORPORATE REAL ESTATE

A company's largest expense, after the cost of employees, is corporate real estate related. This includes the space in which employees are housed, and often this is leased space, not owned. Property Managers are faced with constantly changing space needs whether the organization is expanding, downsizing, or relocating. Being able to correctly understand and project the needs of a corporate real estate tenant in order to negotiate the best lease in the best location will ultimately save the organization time and dollars. This course will focus on how to understand programming requirements for the corporate real estate tenants needs, determine how much square footage is required and how to investigate potential new space and understand the associated lease. (3 credits) spring

CMRE3000 REAL PROPERTY ANALYSIS

This course examines the development process for real property. Topics include project inception, site identification and property acquisition, development feasibility, entitlements process, risk assessment, asset valuation, debt and equity financing, design/construction and project management. *Prerequisite:* CMRE2000 (3 credits) fall

CMRE4000 REAL PROPERTY SECURITIZATION

This course introduces the analysis of mortgages, mortgaged backed securities and other structured financing. Other topics include, fundamentals of interest rate determination, yield curves and borrowing, and lending decision criteria. *Prerequisite:* CMRE3000 (3 credits) spring

Communication (COMM)

COMM3100 PROFESSIONAL COMMUNICATION

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. *Prerequisites:* ENGL1050 and ENGL2050 (3 credits)

COMM3800 SPECIAL TOPICS IN COMMUNICATIONS

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.

Prerequisite: completion of an English Sequence (1 - 4 credits)

COMM4102 INTRODUCTION TO MASS COMMUNICATION

This course serves as an overview to the mass media and the process of mass communication including its historical aspects, as well as the relevance of the mass media messages that our students will face today and tomorrow. *Prerequisite:* completion of an English Sequence (4 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)

COMM4205 APPLIED TECHNICAL COMMUNICATION

The goal of this course is to prepare students for all types of professional communication they are likely to engage with in the workplace. Specifically, it focuses on strengthening both written and verbal communication skills by building awareness of audience, context and genre. Students will be working both individually and in teams to draft emails, reports proposals and present information. *Prerequisite:* completion of English sequence (4 credits)

COMM4210 INTRODUCTION TO COMMUNICATION THEORY

Humans are a social species, and we create and maintain relationships (friendly, romantic and professional) through communication. This course helps students understand how to improve relationships with others and understand the human experience by learning more about contemporary theories on how we communicate. Specifically, we examine theories about communication in one-to-one, small group and organizational contexts. By the end of the course, student will have an increased body of knowledge about the effects of communication from psych-social and cultural perspectives. *Prerequisites:* 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 other 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)

COMM4330 FILM AND CODE

In this course, students will plumb film's relationship to three forms of code –aesthetic conventions and practices, social codes and laws, and more recently software code –to come to a fuller appreciation of how film has evolved since its invention in the late 1800's and how it continues to work its magic on us through its adaptive dance with those three forms of code. **Prerequisite:** Completion of an English Sequence (4 credits)

COMM4335 SEE IT AND SAY IT WITH DATA VIZ

Regardless of profession, being able to gather, analyze, and visualize high quality data to gain insight into an issue and successfully articulate your findings to key decision-makers makes you a more valuable asset. This course takes a holistic approach to data-driven decision-making by introducing the theory, practice, and ethics of effective project and audience definition; data collection and survey design; data scraping, blending and cleaning; and data analysis and visualization using a variety of software applications. You will leave this course with improved abilities to collect, analyze, and visualize data –and in a way that has integrity and validity and that successfully engages your audience. **Prerequisite:** Completion of 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

COMP1010 FUNDAMENTALS OF IT

This course covers the fundamental concepts and skills of information technology (IT) inclusive of computing systems, computer architecture, information management, programming and application developments, operating systems, IT infrastructure, and modern communication architectures. (4 Credits) fall

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, overloading, inheritance, 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 provides an introduction to networking and computing systems including operating systems, technical aspects of the Internet and internetworking. (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 and MATH2300 (4 credits) fall, spring*

COMP1500 FOUNDATIONS OF INFORMATION SECURITY

Information security dates back to the earliest times of human civilization. In more modern times, the concepts involved in information security discussions have taken on a digital, or cyber, connotation. Often missing from a discussion related to information security is context for those outside of the field of computing. This course provides that context in order for students to gain insight into the people, processes, and technologies related to information assurance, privacy, threats, vulnerabilities, and more. Students will apply concepts related to data confidentiality, integrity, utility, authenticity, and access controls as they relate to their discipline(s). (4 credits)

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*

COMP2010 SYSTEM ANALYSIS & DESIGN

This course covers the principles of information systems, including analysis, design, and implementation. Students will learn techniques and methodologies in system development, project management, system analysis including process and data modeling, and designing databases and the human interface. Object-oriented information system modeling will be explored. *Prerequisite: COMP1010 (4 credits) fall*

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*

COMP2110 INFRASTRUCTURE DESIGN

This course introduces the design and required components that enable computing and communication between users, services, applications, and processes. The course focuses on the network core devices, such as routers and switches, as well as servers and network access devices, and how all these devices come together to make up a network infrastructure.

Prerequisite: COMP1100 (4 credits) 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: COMP1100 or COMP2100 (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*

COMP2210 FUNDAMENTALS OF INFORMATION & DATA MANAGEMENT

This course introduces students to databases and information management. Topics include query languages, database organization and architecture, data modeling, managing the database environment, and special-purpose databases. *Prerequisites: COMP1050; MATH2300 or MATH2800 (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: COMP2000 (4 credits) 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*

COMP2540 ETHICAL HACKING

This course teaches students how to properly secure a network by introducing them to various methodologies and techniques of attacking and disabling a network. Students will receive a simulated hands-on practical approach to penetration testing measures and ethical hacking. Coursework is supplemented by hands-on exercises of attacking and disabling a network, and the use of appropriate tools for defense and countermeasures, with emphasis on teaching students to use what they learn ethically and legally. Students will be required to sign the White Hat Oath. *Prerequisites: COMP1000 and COMP2500 (4 credits) summer*

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, spring

COMP2670 DATABASE MANAGEMENT SYSTEMS

An introduction to the use of database management systems. Covers hierarchical networks and relational systems, and techniques for designing, creating, accessing and maintaining data bases. (4 credits) fall, spring

COMP3010 IT SOFTWARE DEVELOPMENT & MANAGEMENT

This is an introduction to software development and management in information technology. Students will learn how to integrate Agile application lifecycle management (ALM) and DevOps to build better software and systems at lower cost. Topics include, but are not limited to, ALM methodology, software development process, Agile ALM, Agile process maturity, rapid iterative development, building engineering in ALM, information technology operations, and DevOps. **Prerequisites:** COMP1050 and COMP2010 (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 file 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)

COMP3210 ADVANCED INFORMATION MANAGEMENT

This course covers analysis of relational and non-relational databases and their corresponding database management system architectures. Complex database objects will be built to support a variety of needs from both the big data and traditional perspectives. Topics includes data systems performance, scalability, and security. **Prerequisite:** COMP2210 (4 credits) summer

COMP3220 DATA ANALYTICS

This course will introduce the student to data analysis programming. The objective is for the student to develop programming and statistical computing skills to address data management and analysis issues. The course will also provide a survey of some of the most common data analysis tools in use today and provide decision-making strategies for selecting the appropriate methods for extracting information from data. **Prerequisite:** COMP2210 (4 credits) fall

COMP3225 GAME DEVELOPMENT

This is an introductory course that covers the fundamental concepts and skills of programming using an industry standard game engine. Students will learn the tools to take a game from concept to polished program. This includes 2D/3D art, animation, sound and music, game AI, and visual effects. The semester will end with a game-jam-style final project. **Prerequisite:** COMP2000 (4 credits) fall

COMP3310 IT ECONOMICS

A major set of tasks for IT leadership is to properly determine which projects and programs should be undertaken, when they should be initiated, and how they should be financially evaluated. This course provides insights into these facets of IT leadership by discussing how to select IT projects/programs using determining factors, real options, and IT vision vs. realization. The course also focuses on build vs. buy strategies, the RFP drafting process, and the evaluation of proposals for IT project success. **Prerequisite:** COMP3010 (4 credits) summer

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 (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

COMP3480 CLOUD COMPUTING

This course presents an overview of the field of cloud computing, its enabling technologies, main building blocks, and tools. Students will learn state-of-the-art cloud-computing solutions and obtain hands-on experience in designing and implementing modern cloud applications utilizing public cloud infrastructures. **Prerequisite:** COMP2000 (4 credits) fall

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

COMP3510 INTERNET OF THINGS SECURITY

This course will examine the security and privacy concepts for Internet of Things (IoT) along with the current standards, protocols, and security measures. IoT devices sense, anticipate, and respond to our needs as we manage them remotely. Hence, they can act as the gateway between our cyber and physical world. Through this course, students will learn to recognize threats, vulnerabilities, and attacks that are possible on an IoT platform and its components. This course provides students with adequate skills to detect IoT attacks through formal modeling and forensics and to defend against such attacks. **Prerequisites:** COMP2500 (4 credits) Summer

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

COMP3555 EDGE SECURITY

Edge computing devices are comprised of hardware devices that perform the two essential functions of providing physical connectivity and enabling traffic between networks. This course introduces the concepts of edge computing security. Students will explore the design and implementation of layered security systems using appliances like firewalls and intrusion detection systems / intrusion prevention systems. Cloud security concepts and components will be explored. **Prerequisite:** COMP2500 (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)

COMP3610 INTRODUCTION TO HEALTH INFORMATICS

This course provides students with the fundamental knowledge of the concepts of health informatics and how technology can be used in the delivery of health care. The emphasis is on conceptual frameworks as well as a deeper level of engagement with system applications in public health and healthcare. This course also provides a basic understanding of data standards and requirements, and the critical concepts and practice in mapping and interpreting health information. **Prerequisites:** COMP1000 and MATH2300 (4 credits) fall

COMP3620 MOBILE HEALTH SYSTEMS

This is an introduction to mobile health systems. It introduces the design of mobile health systems and homecare medical devices, and it guides students to apply learned knowledge to build their own mobile health systems. Topics include microcontroller systems and programming, medical devices and mobile health, homecare medical devices, sensors and systems for medical devices, clinical study using mobile technology, and basic mobile app development. **Prerequisite:** COMP1050 (4 credits) summer

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 BIOINFORMATICS

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)

COMP3725 SOCIAL NETWORK ANALYSIS

This course provides students with essential analyzing and modeling techniques for understanding and extracting information from online social networks such as Facebook, LinkedIn, and Twitter. Students will learn how to apply the basics of social network analysis at the node (ego) level (degree, betweenness, closeness, eigenvector centralities, PageRank, neighbors, and bridges); at the group (sub-graph) level (cliques, clustering coefficient, triadic analysis, structural holes, brokerage, transitivity, and hierarchical clustering); and at the network level (degree distribution, components and isolates, cores and periphery, network density, shortest paths, reciprocity, affiliation networks and two-mode networks, and homophily). **Prerequisites:** COMP2000 (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)

COMP4060 BLOCKCHAIN TECHNOLOGIES

Blockchain technologies enable a digital decentralized society where people can contribute, collaborate, and transact without having to second-guess trust and transparency. As a result, blockchain is revolutionizing the way applications are built to serve people. This course covers fundamentals of blockchain, cryptocurrency, smart contracts, alternative blockchains, and the challenges and future of blockchain development. Students will work in teams to gain hands-on experience building decentralized applications using blockchain technologies and tools. **Prerequisite:** COMP2000 (4 credits)

COMP4110 NETWORK DESIGN & MANAGEMENT

This course covers network design life cycle, initially starting with PDIOOR (Plan, Design, Implement, Operate, Optimize, Retire Network Segments and Components) focusing on wireless network design and data center design. Then this course introduces network management methods based on FCAPS (Fault, Configuration, Administration, Performance, and Security), SNMP (Simple Network Management Protocol), and other contemporary management and design models. **Prerequisites:** COMP2110 or COMP1150 (4 credits) summer

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)

COMP4225 GAME DESIGN PROJECTS

In this course, students will strengthen their game design and development abilities by developing an original game from concept to completion using the conventional game-development approach. Throughout the semester, students will take on individual duties within teams of 2-3 students, developing a proposal, prototyping their concepts, playtesting, and iteratively refining their games with the help of peers and play-testers. **Prerequisite:** COMP3225 (4 credits) fall

COMP4310 QUALITY MANAGEMENT OF IT SYSTEMS

As information technology and operations technology continue to merge within the modern enterprise, it has become increasingly important to properly manage their joined functions and operations. Inclusive of the software, hardware, and people that make up these systems, implementing an IT quality management framework is necessary for long-term success. This course covers the foundations of different IT quality standards, provides insight into implementing appropriate controls and measures, and specifies activities to ensure that each system is meeting its operational expectation. This course is framed in the context of IT service management. **Prerequisite:** COMP3010 (4 credits) fall

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 remediated. 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)

COMP4590 PUBLIC KEY CRYPTOGRAPHY

This course covers the principles of cryptography, system security and network security. The necessary mathematical background (principles of number theory, prime numbers and modular arithmetic) and resulting system and network security implementations (protocols, techniques, and architectures) are treated in parallel throughout the course. The primary focus of the course is Public Key Cryptography (PKC), key management, hash functions, digital signatures, and certificates. Advanced topics on Elliptic Curve Cryptography (ECC) and quantum security will also be covered. **Prerequisite:** COMP1050 (4 credits)

COMP4600 QUANTUM COMPUTING FOR SECURITY

This course introduces students to quantum security. Quantum security is a multidisciplinary field and intersects with computer science, mathematics, and physics. This course covers the theory to understand quantum computing and then presents and analyzes many of the most important algorithms that provide exponential speed up compared to their counterpart algorithms that execute on classical computers.

Prerequisites: COMP2350, MATH2100, and MATH2860 (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)

COMP4725 BIG DATA PROGRAMMING

Students in this course will learn big data technologies such as Apache Spark and Apache Hadoop. They will learn how to use low-level application programming interfaces (APIs) of big data systems such as resilient distributed datasets (RDDs); structured APIs such as Spark SQL with DataFrames; and streaming APIs such as Spark structured streaming and Apache Spark streaming. **Prerequisite:** COMP2000 (4 credits) fall

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. **Prerequisites:** COMP3125 (4 credits)

COMP4760 IMAGE PROCESSING

This course provides an introduction to basic theories, algorithms, and machine learning methods (convolutional neural network) used in image processing and computer vision. Students will learn programming and develop hands-on experience in image processing and computer vision.

Prerequisite: COMP1000 (4 credits) spring

COMP4770 ARTIFICIAL INTELLIGENCE FOR GAMING

The aim of this course is to teach artificial intelligence (AI) techniques for implementing realistic and believable agents and their environments in computer games in order to create a realistic, fun, and engaging experience for players. Students will engage in several readings, discussions, and programming assignments. Students will also work on a final project that demonstrates most of the game AI techniques learned in this course. **Prerequisites:** COMP1050 (4 credits) Summer

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

COMP4960 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 (4 credits) spring

COMP5050 MODERN COMPUTING

This is a survey course of modern computing topics. The purpose of this course is to provide students with a fast-paced experience with several key concepts and associated technologies that provides context for applications, systems and information flow in modern computing environments. Each topic is presented in a modularized approach, as faculty with specific expertise will deliver each module. Each student will gain hands-on experience with projects related to each module.

Prerequisite: Enrollment in MSACS graduate program. (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

COMP5700 CLASSICAL ARTIFICIAL INTELLIGENCE

This course is a graduate-level overview of fundamental techniques for building intelligent systems. Topics include combinatorial search, decision making, knowledge representation, planning, reasoning under uncertainty, and learning. Students will implement algorithms using each of these techniques to build fully functional programs. **Prerequisite:** COMP5050 (4 credits) summer

COMP5705 DATA MINING

Data mining is the process of finding hidden patterns and rules in large datasets. This course is a graduate-level survey of basic concepts, methods, tools, and techniques related to data mining. Topics include data preprocessing; data warehousing and online analytical processing; data cube technology; mining frequent patterns, associations, and correlations; advanced pattern mining; and outlier detection. **Prerequisite:** COMP5700 (3 credits)

COMP5710 PRINCIPLES OF MACHINE LEARNING

Machine learning is a rapidly growing field that powers many of the services we use today. This is a graduate-level course that covers advanced machine-learning concepts in depth. The topics in this course include (but are not limited to) global/local optimization, gradient descent/ascent, regression, categorical cross entropy, classification, logistic regression, matrix factorization, feature engineering, feature selection, boosting, and regularization. **Prerequisite:** COMP5700 (3 credits)

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 a final project. (4 credits)

COMP5775 ADVANCED PARALLEL COMPUTING

This course will expand on 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

COMP5900 PROGRAMMING FUNDAMENTALS

A gateway course into the MSACS program 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 object-oriented programming, GUI development, and basic data structure usage. (6 credits) fall

COMP5925 DATA STRUCTURES & ALGORITHMS

This course introduces fundamental data structures and algorithms as a gateway into the MSACS program. Students study features and differences of these constructs, including theoretical analysis, implementation, and applications. Topics include lists, queues, trees, graphs, sorting, computational complexity, and algorithm strategies.

Prerequisites: COMP5900 (6 credits) spring

COMP6420 REVERSE ENGINEERING

This course introduces the concepts for reverse engineering of both binary (compiles) and interpreted software. Key concepts and tools for analysis of the construction and operation of software are critical to the course. Students will gain practical experience with assemblers and disassemblers, source code debugging, hex editors, code auditing, and different binary file formats. This course focuses on 32- and 64-bit architectures (Intel and AMD) for the Microsoft Windows platform. Alternative architectures, such as ARM and Power, will be covered as contrasting options. *Prerequisites:* COMP6500 (3 credits)

COMP6500 ADVANCED NETWORK SECURITY

This course addresses network security concepts from perimeter to zero-trust. Topics such as defense-in-depth, cryptography and key management, wireless security, secure routing, and secure management are addressed with specific focus on real-world application and implementation. These topics are presented with the goal of collecting, evaluating, and analyzing events that provide sufficient security visibility and posture in order to rapidly respond to events and incidents.

Prerequisite: Enrollment in MSCA Program (3 credits) fall

COMP6520 MALWARE ANALYSIS

This course introduces fundamental concepts of active malware analysis. The course defines and develops the skills needed to analyze and dissect modern malicious software threats. Students develop a workflow that includes the use of static and dynamic tools to assess and reverse engineer a variety of file formats commonly used by threat actors. Assemblers and disassemblers for 32-bit and 64-bit architectures are utilized to analyze files and code samples. Basic reporting strategies and outlets are discussed. *Prerequisites:* COMP6500 (3 credits)

COMP6550 THREAT INTELLIGENCE

This course addresses the evolving discipline of threat intelligence as it applies to threat hunting. The course focuses on the challenges of threat hunting in enterprise-scale networks, and the options available to address these challenges. Different threat hunting models are presented and discussed for usage in strategic, operational, and tactical environments. The course also addresses threat actor motivations, capabilities, and tactics in order to better implement data-driven collection, evaluation, identification, collation, correlation, and action. *Prerequisites:* COMP6500 and DATA6150 (3 credits) spring

COMP6580 DIGITAL FORENSICS AND INCIDENT RESPONSE

This course introduces the fundamentals of digital forensics and incident response investigations. While these investigations follow similar processes and utilize similar tools, their desired outcomes differ: legal attribution and prosecution vs. return to operations. Formal methodologies, frameworks, processes, and procedures for conducting DFIR investigations are discussed and evaluated. The relevant legal framework requirements for DFIR investigations are examined as well.

Prerequisites: COMP6500 (3 credits)

COMP6760 COMPUTER VISION

This course introduces both fundamental and advanced topics in the field of computer vision. The topics in this course include image filtering, segmentation, image feature extraction, and deep neural network application in computer vision. Students will learn how to use computer vision and machine learning to solve real-world problems. (3 credits) fall

COMP7500 THESIS I

This course prepares students for research and activities related to a graduate-level thesis. This includes identification of valid research questions, detailed literature review processes, determining appropriate variables necessary for a detailed examination of the stated research question, and aligning a methodology to a stated research problem. Students will develop the ability to clearly and concisely state the significance of a problem and indicate why the problem should be studied in more depth. The final output of the course is a thesis proposal and its successful defense. *Prerequisite:* COMP5700 (3 credits) fall

COMP7550 THESIS II

This course provides students the ability to perform their approved thesis research. Students will gain experience with leading a research project that addresses a specific hypothesis, managing any experimental process(es), gathering outputs, analyzing and interpreting results, and reporting findings. Documentation of each step of the research project will be completed for both written and oral presentation and defense of the project. Students will gain real-world experiences with identifying and working within limitations and delimitations of their defined project goals. Finally, students will identify where potential improvements or corrections could be made to their work, as well as defining a path for future work to continue on their defined research problem. *Prerequisite:* COMP7500 (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.

Computer Science and Society (CSAS)

CSAS1000 INTRODUCTION TO COMPUTER SCIENCE + SOCIETY

This course offers an introduction to the intersections between Computer Science and society through a survey of digital projects and techniques. Students will gain familiarity with the application of the tools of Computer Science and the frameworks of the Humanities and Social Sciences to relevant problems or scenarios. Emphasis is placed on identifying, procuring, and interpreting various types of sources and data. Topics will vary and may include textual analysis, spatial analysis, data visualization, web technologies, mobile technologies, 3D printing, and other forms of inquiry and applications relevant to themes drawn from the Humanities and Social Sciences. (4 credits) fall

CSAS2000 COMPUTER SCIENCE + SOCIETY STUDIO

In the CSxS Studio, Computer Science plus the study of society yields a product greater than the sum of its parts. This course offers intermediate-level work on the intersections between Computer Science and society. Emphasis is placed on analyzing and interpreting the various types of sources used in the Humanities and Social Sciences. Topics will vary and may include textual analysis, spatial analysis, data visualization, web technologies, mobile technologies, 3D printing, and other forms of inquiry and applications relevant for projects in the Humanities and Social Sciences. Aspects of agile project management will be incorporated.

Prerequisite: CSAS1000 (4 credits) spring

CSAS5000 COMPUTER SCIENCE + SOCIETY SENIOR PROJECT

Principles of agile project management will be employed in navigation of semester-long, interdisciplinary research projects. This course provides the opportunity for students to research, design and implement solutions to problems or scenarios using the principles of Computer Science and the critical frameworks of the Humanities and Social Sciences. Topics will be chosen in consultation with the instructional team. Projects will be carried out in teams. Students will be responsible for individual as well as group contributions. **Prerequisites:** Two (2) semesters of CSAS2000 (4 credits) summer

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 OF 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. **Prerequisite:** 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

This course will cover topics such as project scheduling methods, types of schedules, CPM mechanics, and schedule resource loading and reports. Students will explore computer applications using current scheduling software. **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.

Prerequisites: COOP3000 or COOP3500 or COOP4500 (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. (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 (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. (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

CONM7150 CONSTRUCTION ESTIMATING

This course serves as a leveling course for students without a construction background and as an open elective to students with a construction-related background. The course provides students with the knowledge to perform construction estimating using digital tools and software, construction bidding, and cost control. Course lectures cover quantity takeoffs from construction plans; specifications on materials, labor, equipment, profit, contracts, bonds, and insurance; and overhead of a construction project. The course also highlights the importance of cost control and monitoring project cash flow. Students are introduced to construction estimating software utilized in the construction industry. (3 credits) fall

CONM7175 CONSTRUCTION PROJECT SCHEDULING AND CONTROLS

This course serves as a leveling course for students without a construction background and as an open elective for students with a construction-related background. The course provides an understanding of scheduling principles, construction cost control methodologies, and the use of schedules for monitoring the health of construction projects. The course also introduces the technology behind planning, sequencing, and visualizing the schedule of a project. The course focuses on industry standard software for project planning and scheduling. (3 credits) fall

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 (OPTIONAL)

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 COOP3000 will impact the student's enrollment status; students are strongly urged to contact their Financial Aid Advisor for more information. 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 a course unique to the on campus COOP or enrollment in an approved external certification preparatory course. 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 COOP5000 will impact the student's enrollment status; students are strongly urged to contact their Financial Aid Advisor for more information. *Prerequisite: COOP3500 and COOP4500; permission of the Director of CO-OPS + CAREERS; 2.0 or higher cumulative GPA*

COOP6500 GRADUATE COOP EDUCATION

Graduate 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 the students program. Enrollment in this course requires 32 - 40 hours per week for the duration of the semester. Students must maintain a 3.0 GPA and thereby be in good academic standing. *Prerequisite: enrollment in a graduate program (0 credit)*

Data Science (DATA)

DATA3010 DATA MINING

This course will primarily focus on techniques used for solving data mining problems. Topics include data preprocessing; mining frequent patterns; associations, and correlations; text mining; graph mining; clustering; and recommender systems. In addition, the course will look at ethical implications of data mining. *Prerequisites: COMP3125 (4 credits) fall*

DATA5500 SENIOR DESIGN

Students will form small teams and participate in the design and implementation of data-insightful solutions to large-scale problems. Problems will be chosen in consultation with the instructor. Each team is required to apply techniques and tools throughout the data analysis lifecycle and present the resulting knowledge via written documentation and oral presentation. **Prerequisite:** Senior Status (4 credits) summer

DATA6000 APPLIED STATISTICS FOR RESEARCH

This course introduces graduate students in data science and engineering to a set of supervised and unsupervised tools for modeling and understanding complex datasets. Topics covered include statistical learning, linear regression, point and interval estimation and hypothesis testing, analysis of variance, classification, linear model selection and regularization, support vector machines, and unsupervised learning. (3 credits) fall

DATA6100 DATA VISUALIZATION

This course focuses on strengthening students' core data-analysis and data-visualization mindset and skills and prepares students to contribute to any organization's data-inspired decision-making. Students will leave this course with improved abilities to articulate project objectives; blend, structure, and analyze datasets; and share findings using data visualizations that engage audiences through story, interactivity, and design principles grounded in an understanding of human perception. (3 credits) fall

DATA6150 DATA SCIENCE FOUNDATIONS

This course provides an overview of the field of data science and examines a variety of tools for solving data-insightful problems. The presented methodologies include numerical computing, data processing, visualization, and making predictions via machine learning. Bias and ethics in data science and their potential consequences are also discussed. (3 credits) fall

DATA6200 DATA MANAGEMENT

This course introduces the necessary concepts for comprehensive data management strategy, such as data collection, storage, and retrieval. Topics covered include database management systems, introduction to database theory, and management of data in an organizational environment, as well as big data technologies. (3 credits) spring

DATA6250 MACHINE LEARNING FOR DATA SCIENCE

This course introduces supervised and unsupervised machine learning techniques as well as main approaches to dimensionality reduction using minimal theory and hands-on examples. The course utilizes popular, yet simple and efficient tools to learn from data and to create production-ready models. Topics start with fundamental classification algorithms, such as linear regression, and progress to deep neural networks. **Prerequisite:** DATA6150 (3 credits) spring

DATA6710 APPLIED DEEP LEARNING

The objective of this course is to democratize the popular field of artificial intelligence (AI) by designing deep learning architectures via open-source, popular, yet easy-to-use frameworks. The course covers the fundamentals of deep learning and best practices to develop state-of-the-art AI models to solve vision and sequence processing problems, as well as generative and adversarial techniques. **Prerequisites:** DATA6150 (3 credits) summer

DATA6900 CAPSTONE I

This course is the first of a two-course capstone sequence in which students apply their cumulative learning from their program to address a real-world problem. In the sequence students develop a data-informed solution using their analytical, statistical, and/or visualization skills to address complex social problems and to demonstrate integrated knowledge. This first course in the sequence focuses on quantitative and qualitative research methods, including methodology and design, with its main deliverable being an approved project proposal. **Prerequisites:** DATA6150 or MGMT6150 (3 credits) spring

DATA6950 CAPSTONE II

This course is the second half of the Data Science and Business Analytics capstone sequence. Students complete the project proposed in Capstone I, setting forth a constructive argument supported by an analysis of existing literature and synthesis of data. Upon completing the project, the students are to communicate their findings effectively to an audience, in oral, visual, and/or in written format. **Prerequisite:** DATA6900 (3 credits) summer

Design (DSGN)

DSGN1000 VISUALIZATION I/DRAWING I

Visualization I/Drawing I is an interdisciplinary course between the Industrial Design and Interior Design academic units. 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 INTD3000 (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

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

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

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 economies. 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)

ELMC4125 ELECTROMECHANICAL SYSTEMS

This course analyzes the dynamic behavior of mechanical, electrical, 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 MECH3850 (4 credits) summer

ELMC5000 SENIOR DESIGN I

In this first capstone course, engineering students will apply knowledge and skills learned in their undergraduate curriculum toward a proposed project approved by the instructor to investigate, analyze, design, build and test a prototype module for a concept that addresses an issue in society or the environment. Electromechanical engineering projects with real world relevancy are encouraged. 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. Course requirements include oral and written reports. **Prerequisite:** MECH3100, ELEC2850 & ELEC3600 **Corequisite:** MECH3850 (4 credits) spring

ELMC5500 SENIOR DESIGN II

In this second capstone course, engineering students will continue to develop their project. Their prototype module for a concept that addresses an issue in society or the environment will be fabricated and tested. Functional tests at both subsystem and system level will be designed and implemented, with the results analyzed toward determining the feasibility of this design concept to address the identified issue. Students are required to present their full project in oral and written form within the course, and are encouraged to also present within the wider community. **Prerequisite:** ELMC5000 (4 credits) summer

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 nth 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:** ELMC4125 (4 credits)

Electronics (ELEC)

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.

Corequisite: 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, Thevenin, 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, BJT, 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). (4 credits) fall, spring

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, Thevenin'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 or MATH1877 and PHYS1750 (4 credits) fall

ELEC2300 CIRCUIT ANALYSIS

This course gives students an introduction to DC and AC circuit theorems, magnetic and transformer concepts, AC power, three phase balanced circuits, and Laplace Transform analysis. Transient analysis and initial conditions are studied for R-L, R-C, and R-L-C circuits. Laboratory experiments parallel classroom theory and include circuit simulation.

Corequisite: MATH2500 (4 credits) fall

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, BJTs, operational amplifiers, inverting, non-inverting, integrating, and differentiating op-amps, bioinstrumentation amplifiers, filters, oscillators and signal generators, digital logic, Boolean algebra, Karnaugh maps, logic 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

This course explores 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. **Corequisite:** ELEC2250 or ELEC2299 or ELEC2799 or BIOE2500 or COMP1200 & PHYS1750. (4 credits)

ELEC3050 INTRODUCTION TO RENEWABLE ENERGY

This course covers the fundamental principles of renewable energy and the basic energy analysis corresponding to power generation system. Explores principles and concepts as well as applications of renewable energy to electrical power generation. Focuses on topics such as energy consumption, energy production, energy conversion, national electric grid, biomass and biofuels, geothermal, wind power, solar power and hydropower. **Corequisites:** ELEC2250 or ELEC2799 or ELEC2299 (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 covers the basic concepts and techniques of digital image processing. Topics include grayscale and binary processing, image Fourier analysis, image enhancement, and color image processing. Programming is integrated in laboratory exercises to demonstrate the implementation of image processing algorithms, as well as their effects on the spatial information. **Corequisite:** ELEC3600 (4 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 or ELEC2300 (4 credits) fall, spring

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)

ELEC3430 POWER SYSTEMS ANALYSIS

This course provides a thorough study of the power system data necessary, and the methods commonly used in analysis of power systems. The types of studies covered may include: short circuit, symmetrical components and load flow, motor starting, cable ampacity, transient stability, harmonic analysis, switching transient, reliability protective relay coordination, power system modeling, transmission line parameters and representation, and economic load dispatch. **Prerequisite:** ELEC1500 or ELEC2750 (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 (4 credits) summer

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. **Corequisite:** COMP1000 or ELEC2850. (4 credits)

ELEC3675 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:** ELEC2850 (3 credits) fall

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:** ELEC2100 (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. **Prerequisites:** 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 security 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 and ELEC3250 (4 credits) summer

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. This course is cross-listed with ELEC6325 **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)

ELEC5510 FOUNDATIONS OF ELECTRICAL CIRCUITS

This course is an accelerated introduction to DC and AC electrical circuit analysis and measurement techniques. It establishes a foundation in electrical circuits, serving as a transition for interdisciplinary graduate students toward applications of electrical engineering. The concepts of voltage, current, power, resistance, capacitance and inductance are investigated. DC and AC circuit-analysis techniques are covered such as Kirchhoff's Laws, nodal and mesh analysis, and Thevenin's and Norton's theorems. In addition, students will investigate steady state sinusoidal analysis, AC power, three phase balanced circuits and transformers. The expected background of the students would include knowledge of physics and calculus related to electrical and magnetic phenomena.(3 credits)

ELEC5520 FOUNDATIONS IN SIGNALS AND SYSTEMS

This course serves as an accelerated review of the fundamentals of electrical engineering concepts. Topics include analysis of AC circuits using phasors, linear algebra, analysis of linear time invariant (LTI) systems, impulse and step response, convolution, and Laplace, Z and Fourier transforms. Applications of signals and systems in communication and feedback and control will be explored. The expected background for students includes knowledge of calculus and differential equations. (3 credits)

ELEC5540 SMART BUILDINGS

This course explores the application of Internet of things (IoT) to homes, buildings and campuses. Ways to monitor, analyze and control actuators in buildings are investigated. Methods and rationale are studied for communication of building-related data with cloud servers for storage, analytics, and communication of status and alerts with stakeholders. Beneficial functions of smart buildings will be discussed with relation to energy efficiency, utilization of resources, responsiveness, and security. Students will utilize protocols, programming languages and technology for smart building applications. Students will investigate case studies related to smart buildings and present their findings to the class. (3 credits)

ELEC5550 DIGITAL SIGNAL PROCESSING

This course presents the theory and practice of digital signal processing (DSP). Topics include discrete-time signals and systems and the Z-transform, analog to digital conversion (A/D), sampling and quantization, discrete-time Fourier transforms (DTFT) and design techniques for finite impulse response (FIR) and infinite impulse response (IIR) digital filters. DSP applications using a programming language will be explored in applications such as audio processing and telecommunication. The expected background of students includes knowledge of signals and systems.(3 credits)

ELEC5560 POWER SYSTEMS ANALYSIS I

This course explores power systems architecture and its modeling parameters. The course covers the operation analysis of power systems under balanced conditions. Topics of study include overview of power and per unit (PU) system, network matrices and solutions, formulation of power flow and solution methods, automatic generation control (AGC) and new energy markets, and system stability. The expected background of the students is knowledge of AC circuits. This course is cross-listed with ELEC3430 (3 credits)

ELEC5650 EMBEDDED SYSTEMS

This course covers topics in hardware and software co-design for embedded systems, high-level synthesis, and system-level modeling and integration. The course will employ advanced methods of digital circuit design, specification, and synthesis, using computer aided design (CAD) tools for implementation of complex digital systems on field programmable gate arrays (FPGAs) and systems on chip (SoC). The expected background for students includes knowledge in low-level programming of microcontrollers and digital circuit design using a hardware description language. (3 credits)

ELEC5660 POWER SYSTEMS ANALYSIS II

This course explores the performance of power systems, including methods to analyze, collect, and manage data. The theory and analysis of performance for balanced power systems are first reviewed, and then extended to include cases of unbalanced power systems. Topics of study include transmission line parameters, symmetrical components, fault analysis, stability, transient and harmonic analysis, protection, and power quality. **Prerequisite:** ELEC5560 (3 credits)

ELEC5675 VSLI

Students learn design methodologies for very large-scale integration (VLSI) circuits. The design and layout of complementary metal-oxide-semiconductor (CMOS) VLSI circuits are a primary focus, with particular emphasis on how these design decisions affect area, performance, power consumption, and reliability of a circuit. Circuit and devices characteristics are discussed. Various design techniques are presented in class. Students will develop and analyze various custom integrated circuit (IC) implementations by using appropriate electronic design automation (EDA) tools. The expected background for students includes knowledge in logic design, circuit theory, and basic computer programming. (3 credits)

ELEC5700 ROBOTICS & AUTOMATION SYSTEMS

This course presents an overview of robotic and automated systems, focusing on state-of-the art industry practices and future research directions. Topics include robot operating systems, sensor fusion, feedback control, localization and mapping, path and motion planning, robot-robot and human-robot interaction, and autonomous operation. Students will engage in hands-on laboratory exercises and independent and project-based learning implemented via simulations and modern robotic platforms. The expected background for students includes programming knowledge using a high-level language, as well as some experience in electronic interfacing. (3 credits)

ELEC5725 MACHINE PERCEPTION & COGNITION

This course introduces pattern classification methods to both analyze and characterize engineering problems. Students are introduced to feature extraction, linear discriminates, decision theory, nonparametric techniques, and unsupervised learning and clustering. The expected background of the students includes knowledge of probability and statistics.(3 credits)

ELEC5750 INDUSTRIAL CONTROLS

This course covers the concepts, devices, and common practices associated with control systems, with a primary focus on industrial applications. The course explores the hierarchical implementation of industrial control theory. Students will acquire knowledge and develop skills related to programmable logic controllers (PLC), which serve in many industrial applications as the primary edge note for sensors, actuators and communication. Electrical industrial engineering and safety standards are presented throughout the course. The expected background for students includes knowledge of feedback and control systems. (3 credits)

ELEC5825 ELECTRICAL BUILDING SYSTEMS

The fundamental knowledge needed to carry out design calculations for building electrical systems are covered. The concepts discussed and applied include electrical transformers and motors, protection devices, types and sizes of conductors and conduits, fire alarms, and communication methods. General procedures are covered for designing electrical systems based on the National Electrical Code (NEC) requirements and energy efficiency measures specific to electrical equipment and loads. The expected background of students includes knowledge of basic electrical circuit analysis, AC signals, phasors and complex numbers. (3 credits)

ELEC5850 ENGINEERING NUMERICAL METHODS

This course introduces concepts in the area of numerical methods for solving engineering problems. Students are introduced to numerical differentiation and integration, interpolation and extrapolation of polynomials, numerical regression and correlation, solving for roots of equations, linear algebraic equations, solutions of simultaneous equations, and numerical solution of partial differential equations. The expected background of students is knowledge of mathematics used in engineering and basic programming techniques. (3 credits)

ELEC5875 ADVANCED COMPUTER ARCHITECTURE

We will discuss various concepts behind the designs of modern microprocessors. In particular, the topics that will be covered in the course are: performance simulators and evaluation, static and dynamic scheduling, parallelism, speculative execution, memory hierarchy and organization, multi-processing. Additional advanced topics will include domain-specific architectures, abstract-level microprocessor security, and other cutting-edge topics. Students will also do a paper study in a research topic. The expected background of students is knowledge of instruction set architecture and in-order pipelines. This course is cross-listed with ELEC4725. (3 credits)

ELEC5900 INTRODUCTION TO RADAR SYSTEMS

This course explores the fundamentals of radar systems and modern radar implementations. Topics of study include radar concepts, applications, and design issues. Simulation tools are used to solve radar detection problems. The expected background for students includes knowledge of electromagnetic field theory and of signals and systems. (3 credits)

ELEC5925 INTRODUCTION TO MICROWAVE IMAGING

This course explores microwave imaging algorithms and systems. Topics of study include antennas, radar, and signal processing, as well as 1-D/2-D image generation of targets in both free space and hidden behind walls. The expected background for students includes knowledge of electromagnetic field theory and of signals and systems. (3 credits)

ELEC5950 ANTENNA THEORY

This course explores antenna theory, simulation, and design. The course covers Maxwell's equations and the corresponding concepts of antenna analysis and design. Topics of study include parameters of transmitting and receiving antennas and types of antennas, such as dipole antenna, loop antenna, helical antenna, Yagi-Uda antenna, travelling wave antenna, and patch antenna. The expected background for students includes knowledge of electromagnetic field theory. (3 credits)

ELEC5975 PARALLEL COMPUTER ARCHITECTURE

This course will introduce the fundamental principles and practices in both parallel architecture and parallel computing. This course will also examine the challenges of parallel hardware design, parallel software design, and the interaction of hardware and software, where the emphasis will be the co-design of hardware and software to optimize parallelism. Topics to be covered include message-passing and shared-memory parallel programming paradigms, parallel programming, shared-memory and distributed memory architectures, scalability challenges, and interconnection networks for parallel computer architectures. The expected background of the students includes knowledge of computer architecture. (3 credits)

ELEC6125 RENEWABLE ENERGY INTEGRATION

This course covers issues involved with integrating variable renewable energy technologies into the electric power grid. The structure and function of the grid are discussed for cases of conventional sources, and for cases of additional renewable sources. Investigations are made into renewable electrical generation technologies and resource characteristics. Models are analyzed and developed for renewable energy systems, including demand response, peak load saving, load forecasting, and capacity credits for wind and solar generation. The expected background of the students includes electrical power systems analysis and basic knowledge of renewable energy. (3 credits)

ELEC6200 CYBER-PHYSICAL SYSTEMS

This course introduces students to concepts in modeling and analysis of cyber-physical systems. Topics include the analysis of both continuous- and discrete-time systems in the areas of control, signal processing, finite state machines, state-flow, embedded systems, model integration, verification and numerical simulation. Considerations are also made of mobility, security and computing challenges for cyber-physical systems. The expected background of the students includes embedded systems and feedback and control systems. *Prerequisite: ELEC5700 (3 credits)*

ELEC6300 MICROWAVE ENGINEERING

This course explores basic techniques for designing and analyzing passive devices that operate at high frequencies, for which distributed circuit effects must be considered. Maxwell's equations are applied to microwave circuits for analysis and design. Topics of study include transmission lines, network theory, waveguides, microwave filters, and electromagnetic compatibility. *Prerequisite: ELEC5925 (3 credits)*

ELEC7800 GRADUATE SPECIAL TOPICS IN ELECTRICAL 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 special topics course offerings. (4 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)

ENGR1100 INTRODUCTION TO ENGINEERING EXPERIENCE

This course provides an orientation to the engineering profession, the various engineering disciplines, trends in engineering and introduces the notion of lifelong learning. The course is designed to develop critical thinking, learning, and decision-making skills to enhance success in a chosen field of engineering. This course is delivered through lectures, classroom activities, case studies, informational interviews, individual and group work, and presentations and workshops led by engineering professionals in academia and industry. (2 Credits) Fall

ENGR1201 ENGINEERING LABORATORY-BSBE

This course focuses on developing fundamental technical skills and exposure through a sequence of hands-on laboratories. Students are introduced to laboratory safety concepts, experiments design, measurement procedures and techniques, design synthesis, computer-aided design, algorithmic thinking, simulation, and technical reporting. Through a series of hands-on laboratory experiments, students will develop a working knowledge in using and applying modern engineering tools and techniques required for engineering practice. (2 credits) fall

ENGR1202 ENGINEERING LABORATORY-BBME

This course focuses on developing fundamental technical skills and exposure through a sequence of hands-on laboratories. Students are introduced to laboratory safety concepts, experiments design, measurement procedures and techniques, design synthesis, computer-aided design, algorithmic thinking, simulation, and technical reporting. Through a series of hands-on laboratory experiments, students will develop a working knowledge in using and applying modern engineering tools and techniques required for engineering practice. (2 credits) fall

ENGR1203 ENGINEERING LABORATORY-BSCE

This course focuses on developing fundamental technical skills and exposure through a sequence of hands-on laboratories. Students are introduced to laboratory safety concepts, experiments design, measurement procedures and techniques, design synthesis, computer-aided design, algorithmic thinking, simulation, and technical reporting. Through a series of hands-on laboratory experiments, students will develop a working knowledge in using and applying modern engineering tools and techniques required for engineering practice. (2 credits) fall

ENGR1204 ENGINEERING LABORATORY-BSEE/BSCO

This course focuses on developing fundamental technical skills and exposure through a sequence of hands-on laboratories. Students are introduced to laboratory safety concepts, experiments design, measurement procedures and techniques, design synthesis, computer-aided design, algorithmic thinking, simulation, and technical reporting. Through a series of hands-on laboratory experiments, students will develop a working knowledge in using and applying modern engineering tools and techniques required for engineering practice. (2 credits) fall

ENGR1205 ENGINEERING LABORATORY-BELM

This course focuses on developing fundamental technical skills and exposure through a sequence of hands-on laboratories. Students are introduced to laboratory safety concepts, experiments design, measurement procedures and techniques, design synthesis, computer-aided design, algorithmic thinking, simulation, and technical reporting. Through a series of hands-on laboratory experiments, students will develop a working knowledge in using and applying modern engineering tools and techniques required for engineering practice. (2 credits) fall

ENGR1206 ENGINEERING LABORATORY-BSEN

This course focuses on developing fundamental technical skills and exposure through a sequence of hands-on laboratories. Students are introduced to laboratory safety concepts, experiments design, measurement procedures and techniques, design synthesis, computer-aided design, algorithmic thinking, simulation, and technical reporting. Through a series of hands-on laboratory experiments, students will develop a working knowledge in using and applying modern engineering tools and techniques required for engineering practice. (2 credits) fall

ENGR1207 ENGINEERING LABORATORY-BSME

This course focuses on developing fundamental technical skills and exposure through a sequence of hands-on laboratories. Students are introduced to laboratory safety concepts, experiments design, measurement procedures and techniques, design synthesis, computer-aided design, algorithmic thinking, simulation, and technical reporting. Through a series of hands-on laboratory experiments, students will develop a working knowledge in using and applying modern engineering tools and techniques required for engineering practice. (2 credits) fall

ENGR1300 FIRST-YEAR ENGINEERING DESIGN

This interdisciplinary project-based design course engages students to become informed designers. Students will develop the foundation for their future academic and professional careers in an interdisciplinary design environment through this course. Students will apply the engineering design process to develop solutions to open-ended design problems by developing a comprehensive understanding of the problem, constructing a well-thought-out project plan, and establishing the design space defined by constraints and standards. By the conclusion of this course, students will identify, implement, and evaluate an optimal solution using modern engineering tools in an interdisciplinary design environment. (2 Credits) Spring

ENGR1401 APPLIED ENGINEERING ANALYSIS-BSBE

This course provides students with a solid foundation in the analytical tools necessary for engineering practice. Through active and collaborative work, students explore an array of analytical tools as applied to real-world problems. Students develop problem-solving and computational skills in units, dimensions, dimensional homogeneity, vectors, matrix operations, statistical data analysis, algorithmic thinking, programming concepts, and numerical methods. (2 Credits) Spring

ENGR1402 APPLIED ENGINEERING ANALYSIS-BBME

This course provides students with a solid foundation in the analytical tools necessary for engineering practice. Through active and collaborative work, students explore an array of analytical tools as applied to real-world problems. Students develop problem-solving and computational skills in units, dimensions, dimensional homogeneity, vectors, matrix operations, statistical data analysis, algorithmic thinking, programming concepts, and numerical methods. (2 Credits) Spring

ENGR1403 APPLIED ENGINEERING ANALYSIS-BSCE

This course provides students with a solid foundation in the analytical tools necessary for engineering practice. Through active and collaborative work, students explore an array of analytical tools as applied to real-world problems. Students develop problem-solving and computational skills in units, dimensions, dimensional homogeneity, vectors, matrix operations, statistical data analysis, algorithmic thinking, programming concepts, and numerical methods. (2 Credits) Spring

ENGR1404 APPLIED ENGINEERING ANALYSIS-BSEE/BSCO

This course provides students with a solid foundation in the analytical tools necessary for engineering practice. Through active and collaborative work, students explore an array of analytical tools as applied to real-world problems. Students develop problem-solving and computational skills in units, dimensions, dimensional homogeneity, vectors, matrix operations, statistical data analysis, algorithmic thinking, programming concepts, and numerical methods. (2 Credits) Spring

ENGR1405 APPLIED ENGINEERING ANALYSIS-BELM

This course provides students with a solid foundation in the analytical tools necessary for engineering practice. Through active and collaborative work, students explore an array of analytical tools as applied to real-world problems. Students develop problem-solving and computational skills in units, dimensions, dimensional homogeneity, vectors, matrix operations, statistical data analysis, algorithmic thinking, programming concepts, and numerical methods. (2 Credits) Spring

ENGR1406 APPLIED ENGINEERING ANALYSIS-BSEN

This course provides students with a solid foundation in the analytical tools necessary for engineering practice. Through active and collaborative work, students explore an array of analytical tools as applied to real-world problems. Students develop problem-solving and computational skills in units, dimensions, dimensional homogeneity, vectors, matrix operations, statistical data analysis, algorithmic thinking, programming concepts, and numerical methods. (2 Credits) Spring

ENGR1407 APPLIED ENGINEERING ANALYSIS-BSME

This course provides students with a solid foundation in the analytical tools necessary for engineering practice. Through active and collaborative work, students explore an array of analytical tools as applied to real-world problems. Students develop problem-solving and computational skills in units, dimensions, dimensional homogeneity, vectors, matrix operations, statistical data analysis, algorithmic thinking, programming concepts, and numerical methods. (2 Credits) Spring

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 (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)

ENGR7000 MASTER PROJECT

This course provides the framework for students to undertake a project for the non-thesis option of their graduate program. Students will complete an experiential learning endeavor involving self-initiated activity and scholarship. The project will be done under the guidance and evaluation of a project advisor who is a graduate faculty member of the program. The student will investigate a problem related to a field of study in the program, formulate a solution, and design and test module(s) of the solution for feasibility. The student will communicate about their project in both an oral presentation and a written report. (3 credits)

ENGR7100 THESIS I

This course provides the framework for students to initiate and propose a master's thesis. The thesis is a documentation of a project in which engineering principles are applied to address an unresolved challenge related to a field of study in the program. This course guides students through the process of selecting their thesis project, thesis pathway, thesis advisor, and the members of their thesis committee. Students undertake their initial research and development work, and develop a thesis proposal that will include a literature review, an alternatives analysis, a description of proposed designs and testing, and an explanation of how the data resulting from testing will be analyzed. Each student makes an oral presentation and written document of their proposal for feedback and assessment by their thesis committee.(3 credits)

ENGR7101 PROFESSIONAL PERSPECTIVES

This course provides a framework for students to self-select, participate in, provide evidence of participation in, and write reflections for seminar or workshop activities related to being a professional in a field of their program. The overall goal for this course is to increase exposure to professional perspectives and to aspects of professionalism. (1 credit) spring

ENGR7200 THESIS II

This course provides the framework for students to continue and complete the thesis begun in ENGR 7100: Thesis I. With guidance from their thesis committee, students continue their research and development (R&D) work according to their selected thesis pathway, and then document the whole of their project in their thesis. After completing the thesis, students undergo a thesis defense, which consists of an oral presentation and a final meeting with their thesis committee. Based on assessment and feedback by their thesis committee during the final meeting, the student may need to revise their thesis, which may involve more R&D work and analysis. **Prerequisite:** ENGR7100 (3 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

Environmental (ENVM)

ENVM2000 ENVIRONMENTAL FORUM

This course offers an exploration of contemporary issues in sustainability and the environment, with each semester focusing on a different theme. Past themes include Urban Ecology, Food and Food Scarcity, and Cultures of Sustainability. The course features weekly lectures by local, regional, and national experts, as well as a major service learning assignment with an emphasis on social justice. **Prerequisite:** completion of an English sequence (2 credits) spring

Facilities Management (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

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. Topic 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) Graduate Only

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

FMGT8900 FACILITY MANAGEMENT THESIS

The thesis is intended for students who contemplate further study or college level teaching, or otherwise desire to produce a more focused product than can be completed in the capstone course. The thesis is undertaken individually by the student in collaboration with the graduate program director and a faculty advisor, and may be research- or project-based. Students conducting a research-based thesis will define the research question, devise and implement appropriate research methods, gather and analyze data, and report on the research and conclusions. The research thesis reflects the student's knowledge in the field and understanding of prior and current work in areas related to the thesis topic. A project-based thesis includes problem definition, conceptualization of alternative solutions, analysis, selection of best alternative, synthesis, execution, test and evaluation, and documentation. It will integrate all of the skill areas encompassed by the program. Where possible, the thesis will be associated with the student's career path, and contribute value to the student's employer. (6 credits)

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. (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, relocating, 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

In addition to a thorough review of how energy is produced, distributed and used in an organization, students examine how facilities, building operations and maintenance organizations are managed. Topics covered include sources, forms, and methods used to manage energy consumption in buildings, how a building operates, and developing an effective operations team. Moreover, this course will study sustainability in a global context and current methods in creating a sustainable work environment using LEED and other modern techniques. *Prerequisite:* CONM1000 (3 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

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)

HIST4151 HISTORY OF BASEBALL

This course explores baseball as a lens through which we may better understand American history. Since its inception, baseball has been the quintessential American game. Its rise as a pastime and institution—both locally and globally—parallels that of the United States itself, and its study reveals much about American life. This course analyzes not only how baseball reflected American politics and culture, but how it influenced them as well. To that end, this course explores topics such as American identity and mythmaking, the rise of spectacle and consumer culture, tensions between business and labor, politics of race and gender and globalization. **Prerequisites:** 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 an English Sequence (4 credits) fall

HIST4251 THE CIVIL WAR

The course deals with the central American event of the nineteenth century. The years before the war, the war itself, Reconstruction, and the meaning of the war today are among the topics studied. **Prerequisite:** Completion of an English sequence (4 credits)

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)

HIST4351 HISTORY OF ANCIENT AFRICA

This course provides an introductory survey of the historical development of Mediterranean, Sahara, and Sub-Saharan African societies from human evolution to the beginning of European colonialism. It explores how social groups responded to Africa's varied geographical regions and created diverse political, economic, and cultural systems. The course also reflects on how elements of ancient African culture continue to influence modern globalized societies. **Prerequisite:** Completion of an 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

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)

HUMN3221 GLOBAL ADVENTURERS & EXPLORERS

This course explores great adventures past and present and the stories they tell, with a focus on mountaineers, climbers, and arctic voyagers on land and sea. Through discussion and analysis of film, media, and text, the course examines the human drives to reach summits, establish new passages and routes, and attain ever-greater feats of athleticism in harsh terrain. The course also investigates the art of adventure story telling through film and written word. **Prerequisite:** 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

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)

HUMN4100 APPROACHES TO AMERICAN STUDIES

This course offers an interdisciplinary approach to the history and culture of the United States within a global context. Students use a variety of methodological tools to explore the diversity of American culture, with attention to the roles of race, gender, sexuality and socioeconomic class. Forms of cultural production studies will vary and may include literature, film, music, painting, photography and advertising. **Prerequisites:** completion of an English sequence (4 credits)

HUMN4121 RELIGION & CULTURE

Why are people religious? What does it mean to be religious? How do the world's religions bind us together? How – and why – do they divide us? These are some of the essential questions this course will investigate. Through an interdisciplinary approach to the study of religion and spirituality, this course will expose students to various religious schools of thought and cultural traditions so as to broaden their appreciation of the human condition. It will investigate the role of religion in shaping historical and contemporary culture, with a primary focus on the United States. It will treat major world religions – Judaism, Christianity, Islam, Buddhism, Hinduism – and multiple forms of spirituality – feminist, nature, African-American, Native American, New Age – as they are manifest throughout history and in our lives today, in both public institutions and private devotional life. **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 EXPLORING THE GRAPHIC NOVEL

Regardless of profession, being able to gather, analyze, and visualize high quality data to gain insight into an issue and successfully articulate your findings to key decision-makers makes you a more valuable asset. This course takes a holistic approach to data-driven decision-making by introducing the theory, practice, and ethics of effective project and audience definition; data collection and survey design; data scraping, blending and cleaning; and data analysis and visualization using a variety of software applications. You will leave this course with improved abilities to collect, analyze, and visualize data –and in a way that has integrity and validity and that successfully engages your audience. **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)

HUMN4260 MODERNISM IN THE ARTS

This course examines the development of Modernism as a creative explosion of revolutionary ideas and forms that responded to the tumultuous events of the first half of the 20th century in Europe and the United States. While visual art will be the central focus, Modernism will be seen through a wider lens that incorporates music, literature, poetry, theater and dance as contributing forms of the "new modern." Indeed, the constant exchange of ideas between painters, writers, poets, composers, choreographers and playwrights can be seen as the soul of Modernism. **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)

HUMN4320 TOYS ARE U.S.: AMERICA AT PLAY

This course will investigate the history, theory, and design of "play" in America – how we have thought about the role of fun, imagination, and amusement as serious and worthwhile pursuits. Philosophers and historians, sociologists and cultural theorists, health professionals and educators, legislators and corporations have all engaged a vigorous debate about the nature of "play" - its benefits and its dangers – in cultural and human development. Alongside these ideas and their evolution, we will consider how artists, designers, engineers, and marketers have shaped and "sold" them to us. We will examine toys and games as the material embodiment of our attitudes about work and play, and as the site for exploring the social implications of design and material culture. **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)

HUMN4330 CLIMATE CHANGE & THE HUMANITIES

This course responds to the wicked problem of climate change by leveraging the power of the humanities, especially literature and the visual arts. Students will use those media as a springboard to practical knowledge about the climate-challenged processes of the natural world. They will also engage with a range of cultural production (short stories, novels, poems, essays, paintings, photographs, films, and advertisements) to understand the key ideas and values that have shaped our society's relationship to "nature." The class will explore the ways in which the climate crisis is a crisis of the imagination and will actively seek points of intersection with STEM and design fields. Materials will cluster around topics currently receiving urgent attention, which could include (but are not limited to) wilderness, deforestation, water and drought, melting ice, and biodiversity. **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)

Humanities and Sciences (HSSI)

HSSI4000 SCIENCE, TECHNOLOGY & SOCIETY

This course is an interdisciplinary course that explores relationships between scientific inquiry, technologies and the societies that employ them. The course approached the study of science and technology and their relationships to society from a variety of perspectives, including historical, philosophical, sociological, political, literary and artistic.

Students are engaged in their major fields of study in disciplines whose goal is to utilize design, engineering and technology to make life "better." This course aims to help students define what constitutes "better" and for whom, and to understand how science and technology can both promote and hinder this quest for better. **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 or INTD1000 or ARCH1000 (4 credits) spring

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 or ARCH1200 (3 credits) spring

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:** INDS2500 (4 credits) spring

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) fall

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: IND2300; Corequisite: IND3000 (4 credits) fall

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: IND2350 (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: IND2500 (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. (3 credits) fall

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: IND1750 (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: IND3000 (4 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; IND2600 and IND2800 (3 credits)*

INDS3800 SPECIAL TOPICS IN INDUSTRIAL 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)

INDS4000 INDUSTRIAL DESIGN STUDIO 7

This studio-based course focuses various design themes such as consumer electronics, furniture, and footwear design. *Prerequisite: IND3500 (4 credits)*

INDS4011 DESIGN PERSPECTIVES: TOPICS IN HISTORY

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: IND3300 (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: IND4000 (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 or IND1000 or ARCH1000 (4 credits) spring*

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

INTD3010 INTERIOR STUDIO V

Demonstrating their proficiency with the design process, students develop comprehensive solutions for interior environments by synthesizing their expanding theoretical, aesthetic and technical knowledge, including sustainable design methodologies. **Prerequisite:** INTD2500 (4 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)

INTD3400 BUILDING SYSTEMS & INTERIOR SPECIFICATION

Students explore building systems including acoustics, thermal comfort, and indoor air quality with regard to environmental impact and human well-being. Students select and apply interior materials for the design purpose and develop interior specifications. (3 credits) fall

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)

INTD3510 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:** INTD3010 (4 credits) summer

INTD3600 LIGHTING

Interior illumination is studied in-depth from aesthetic, technical and functional points of view. Conceptual design and documentation, lamps, luminaires, 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)

INTD4010 INTERIOR STUDIO VII

Projects of advanced programmatic complexity are studied in context with institutional building types. Project resolution requires competent and comprehensive solutions that explore and synthesize theoretical, technical and practical issues concerning the integration of selected building systems. **Prerequisite:** INTD3510 (4 credits) spring

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 or INTD4010 (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 or INTD4010 and INTD5000 (6 credits)

Internship (INTN) Graduate Only

INTN6000 GRADUATE INTERNSHIP

Students develop professional, decision-making, and problem-solving skills through structured practical experience with an employer in the field of study. The students will work with the internship coordinator from the COOP office, the field supervisor (i.e., the employer), and the graduate faculty member of the respective field. Students are evaluated through internship reports submitted at the end of the semester, and evaluation reports from the field supervisor during the internship period. Must maintain a cumulative GPA of 3.0. Students may not receive more than three hours of internship credit. School approval is required. (1 credit)

Literature (LITR)

LITR1435 LITERATURE - 20TH CENTURY

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 distinction 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 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. (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 or MGMT2550 (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

MGMT3160 PROJECT RISK

How can we ensure that a project will be successful? Project risk management is the art of dissecting sources of risk and planning how to avoid or handle a negative event. Quite often, the inability to detect and mitigate sources of risk can be the reason that a project may fail. Students will explore this topic through analyzing historical and current mega-sized projects. (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*

MGMT3560 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. (3 credits) summer

MGMT3625 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 negotiating are treated specifically. (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. (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. (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: 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. *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 issue(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. (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. (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. (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) summer

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 course 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

MGMT6150 APPLIED BUSINESS ANALYTICS

This course is about applying data analytics to managerial decision making. It focuses upon distinguishing between uncovering patterns in data and identifying the underlying drivers. Students will use data, data analytics concepts, techniques, and state-of-the-art tools to make faster and better business decisions. Data, statistical and quantitative analysis, exploratory and predictive models, XLMINER, and the R programming language will be reviewed. (3 credits) fall

MGMT6200 QUANTITATIVE MANAGEMENT

Quantitative management involves the use of quantitative systems and techniques for making management decisions. The purpose of this course is to teach basic quantitative techniques like ANOVA, regression analysis, basic statistics, project and inventory modeling, and decision making and forecasting methodology, and how they can be used as part of a systems approach to answering important management questions using quantitative approaches. (3 credits) spring

MGMT6250 DATA-DRIVEN MARKETING

This course provides a sophisticated framework to quantify the impact of various marketing efforts, with special attention to assessing both their short-term and long-term implications. The course explores how traditional marketing measures – such as awareness, preference, loyalty, customer satisfaction, distribution levels, and market share – are linked to strategic outcome. Students will develop skills and gain experience in formulating and implementing specific techniques for analyzing market insights data once it has been collected and using it to make better marketing decisions. (3 credits) spring

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, two 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. Topics 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 or MGMT7100 (3 credits) summer

MGMT7130 EMERGENCY RISK MANAGEMENT

This course focuses on unpredictable events, such as pandemics and natural disasters, to explore the project risk management discipline. The study of project risk teaches us to identify, plan for, and respond to both known and unknown risks. Students will examine how to decrease negative impact and discover ways to increase positive effects of risk. All risk management processes will be covered: risk management planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning, and risk monitoring and control. **Corequisite:** *MGMT7025 or MGMT7100 (3 credits) summer*

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)

MGMT7175 ENGINEERING INNOVATION & ENTREPRENEURSHIP

This course provides an inside look at engineering innovation and entrepreneurship from a management perspective. Topics will include case study and industry analyses, as well as relevant research drawn from best practices, innovative ideas, and management theory. The final project of student group work will be a feasibility study and a business plan for commercializing new ideas. The expected background of students includes knowledge of engineering fields. (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 will 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 or MGMT7100 (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 or MGMT7100 and MGMT7125 or MGMT7130 (3 credits) summer*.

MGMT7450 COMMUNICATION STRATEGIES

Communications Strategies focuses on using oral and written communication skills to advance ideas, agendas, and careers in an organization. Students learn how to "read" their audiences and shape their message accordingly. Students will write executive summaries, full reports, and develop presentations to best communicate their ideas. Through case analysis, written assignments, and personal inventories, students learn to identify and adapt to an organization's overt and covert communication protocols, and to observe the "hidden dimensions" of communication with a culturally and gender diverse workforce. (3 credits)

MGMT7500 QUANTITATIVE METHODS IN FACILITY MANAGEMENT RESEARCH

Introduction to the main quantitative and qualitative research methods as applied to facilities management, including tools, proposal writing, and reports. Emphasis is placed upon research planning and design. Topics to be covered include fundamental methodological approaches, the review and evaluation of existing literature and empirical studies through qualitative and quantitative research methodologies, and the design of the student's individual research project. Special attention will be devoted to defining research problems particular to facilities management and the development of the individual research proposal. (3 credits)

MGMT7525 GLOBAL & VIRTUAL PROJECT MANAGEMENT

The course examines how project managers ethically communicate and manage project teams that are distributed in a single facility, across the globe, or virtually. Course topics include environmental factors; cross-cultural considerations; methods to support geographically dispersed; distributed, or remote teams; traditional vs. virtual project management; navigating obstacles, building trust and related issues; and best practices for organizing and managing virtual and cross-border project teams. (3 credits) fall

MGMT7625 MANAGING ERP SYSTEMS

This course introduces students to Enterprise Resource Planning (ERP), a business management model that integrates information from all aspects of the firm; including sales logistics, production/material management, procurement, and human resources. Students to gain an understanding of the importance of the integrated nature of ERP software through case studies and a simulation of a popular ERP application.

Prerequisites: MGMT7025 or MGMT7100 and MGMT7125 or MGMT7130 (3 credits) fall

MGMT7725 PORTFOLIO & PROGRAM MANAGEMENT

This course gives students the ability to develop and manage a group of projects and ensure alignment with the business strategy. Managing several diverse projects simultaneously can provide benefits and synergies that one might not get from managing the projects individually. Students gain an understanding of the critical success factors for portfolios and program management and the key metrics to evaluate the performance of a group of projects. **Prerequisites:** MGMT7425 (3 credits) spring

MGMT7800 GRADUATE 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 special topics course offerings. (1 - 4 credits)

MGMT7825 M.S. PROJECT MANAGEMENT CAPSTONE

This course is the culmination of the MSPM program. Students demonstrate their ability to integrate information learned and skills developed throughout the program. Where possible, projects will be developed in collaboration with industry partners. Upon completion of this course, students prove that they have the knowledge to lead projects and the skills to lead them to a successful completion. **Prerequisites:** MGMT7425 (3 credits) spring

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

MATH1600 INTRODUCTION TO CALCULUS

The first part of the course reviews algebra and precalculus skills, as they appear in calculus. The second part of the course introduces students to the main concepts of calculus including limits, rates of change, and accumulation. This course does not satisfy any degree requirements. (2 credits)

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)

MATH1776 ACTIVE CALCULUS 1A

This course builds on the understanding of functions and a basic concept of limit as developed in a precalculus course. This course covers the fundamental calculus concepts of instantaneous rate of change and accumulation, with an emphasis on conceptual relationships and on numerical approximations of derivatives and integrals. This is a seven week course. (2 credits) fall, spring

MATH1777 ACTIVE CALCULUS 1B

This course builds on knowledge of basic derivatives and continues to develop rules for derivatives of combinations, such as the product and chain rules. It also covers applications of derivatives, including related rates and optimization. This is a seven week course. *Prerequisite: MATH1776 (2 credits) fall, spring*

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)*

MATH1876 ACTIVE CALCULUS 2A

This course builds on a basic knowledge of accumulation and the relationship of Riemann sums to definite integrals. Building on that foundation, the course covers methods of integration including substitution, integration by parts, integration by partial fractions, and the use of tools such as tables or integral calculators. The course also considers geometric applications of integrals of a single variable and the application of integration to solving real world problems. This is a seven week course. *Prerequisite: MATH1776 or MATH1750 (2 credits) fall, spring*

MATH1877 ACTIVE CALCULUS 2B

This course solidifies the basic calculus competencies from integral and differential calculus while building on the relations between them, including discussion of initial value problems and Taylor series. This is a seven week course. *Prerequisites: MATH1777 or MATH1750 and MATH1876 (2 credits) fall, spring*

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. **Prerequisite:**

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 or MATH1800 or MATH1700 or MATH1750 or MATH1850 (4 credits) fall, spring, summer*

MATH2425 CRYPTOLOGY

This course will introduce the mathematics of historical and modern cryptology. 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-Stieltjes 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

MATH5200 METHODS OF CALCULUS

This course is a gateway course into the MSACS program. Topics include limits, integrals, derivatives, numerical derivatives, numerical integrals, Sequences, Series, Taylor series, Newton's method, Lagrange polynomials, Hermite polynomials, steepest ascent/descent, vectors, matrices, eigenvalues, and eigenvectors. (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

MATH5700 MATHEMATICS FOR MACHINE LEARNING

This course prepares students with additional mathematics needed to succeed in a variety of computational disciplines. Topics include linear algebra, matrix decompositions, multivariable calculus, and optimization. (3 credits) fall

MATH5750 APPLIED STATISTICS

This course introduces students to the tools used for statistical and probabilistic analysis. The focus is on the basics of probability, regressions models, hypothesis testing, and understanding the use and interpretation of output data with attention to applications in artificial intelligence. **Prerequisites:** MATH5200 (4 credits) spring

MATH5800 MATHEMATICAL METHODS

This course provides the necessary analytical and numerical background for graduate students in engineering and sciences. Topics include error-bound, truncation method, least square regression for linear and polynomial models, linear algebra and matrix theory, ordinary differential equations (ODE), partial differential equations (PDE), Fourier transform, and discrete Fourier Transform. The expected background of students is knowledge of ordinary differential equations. (3 credits)

MATH7800 GRADUATE 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 special topics course offerings. (4 credits)

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.

Prerequisite: ENGR1600 (3 credits)

MECH2400 APPLIED MECHANICS

This course will cover the equilibrium of particles and rigid bodies. Internal forces in structures such as trusses frames and machines are determined. Axial, torsional, bending and transverse stresses in beams and other structures are calculated. Stress transformation is discussed. Topics such as thermal deformation, statically indeterminate structures, Mohr's circle and buckling is also covered. Four laboratory experiments are used to complement the theoretical learning. **Prerequisites:** PHYS1750 and MATH1850 (4 credits) fall

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. **Prerequisite:** 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)

MECH3300 INTRODUCTION TO LabVIEW & DATA ACQUISITION

This course introduces students to the methods and techniques used in LabVIEW and data acquisition. The topics emphasized are basic programming structures and best practices for programing in the LabVIEW environment. Additional topics include the fundamental concepts of data acquisition, techniques to obtain and analyze measurements of physical properties and quantities related to the field of mechanical engineering. **Prerequisites:** MECH2500, MECH2250 and ELEC2799. (4 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

MECH3450 ADVANCED DESIGN THEORY FOR MECHANICAL COMPONENTS

Why does a mechanical component with a specified factor of safety as 2.4 still fail? The traditional mechanical component design theory cannot answer this vital design question. The advanced design theory for mechanical components uses reliability to describe the safety of a component and clearly explains that any design component will fail due to the variation of material strength, loading and dimension of the component. This course will address techniques for the quantification of uncertainty and risk inherent in mechanical components and implement reliability as the safety index to design mechanical components.

Prerequisite: MECH2500 (3 credits)

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 lab-oratory activities will reinforce the classroom theory. **Prerequisite:** Junior status and MECH2500 or MECH2400 (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. Astronautics: differential, Lagrange's and orbit equations. **Prerequisite:** 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 or MECH2400 and MATH2500 (4 credits) spring

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)

MECH4040 MECHANISMS AND MACHINES

This course covers the kinematics and dynamics of machinery. While the course is on the topics of analysis of mechanisms and machines, it emphasizes also the use of computer-aided engineering as an approach to the design and analysis. Positional, velocity, acceleration, and force are considered in the traditional analysis of mechanisms and machines. The course is an ideal vehicle for introducing the mechanical engineering student to the process of design, since mechanisms tend to be intuitive for the typical mechanical engineering student to visualize and create. **Prerequisite:** MECH3850 (4 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.

Prerequisite: MECH3000 (4 credits) spring

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) fall

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)

PHIL4550 BIOETHICS

This course explores some of the most important ethical issues surrounding biology, medicine, and biotechnology. We will explore issues such as the relationship between science and ethics, the boundaries of life and death, genetic selection and editing, and the moral status of non-human animals. **Prerequisite:** completion of an English sequence (4 credits)

PHIL4600 DESIGNING THE GOOD LIFE

This course explores the impact of design 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 (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 academic unit 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 gasses. **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 Shrodinger 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

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

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, and 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

POLS4482 GLOBAL CITIES

This course introduces students to urban politics and policy by comparing major cities around the world. It will consider how cities in both the developed and developing world are revolutionizing things like transportation, sustainability, housing, even sanitation. Students will also assess the nature of the "global city" and how major metropolises play an important role in an increasingly globalized world. **Prerequisite:** Completion of an English Sequence (4 credits)

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)

PSYC3200 INTRODUCTION TO COMMUNITY LEARNING

In this course students will investigate the nature of community within a global, societal and local context. In the hands-on component of the course, students will actively take part in a collaborative project within the university's neighborhood. By drawing on this experience, as well as principles of social and environmental psychology, students will explore how communities define themselves and establish shared values.

Prerequisite: completion of an English sequence (4 credits)

PSYC3750 PSYCHOLOGY OF ADULTHOOD

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)

PSYC4275 PSYCHOLOGY OF LEADERSHIP

This course introduces students to the theories, concepts, and application of leadership, while also providing students with an understanding of how leadership impacts the degree to which one is able to influence others, and the methods by which one is able to do so. The aim of the course is for students to apply the course material directly to their personal experiences, which will culminate in a personal leadership development plan, similar to those commonly used by executive coaches. The course will enable students to explore ways to incorporate the leadership and introductory psychological material discussed into their personal leadership journey. **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

Industrial and Organizational (I-O) Psychology is a scientific discipline that focuses on human behavior in the workplace. The course will examine how I-O psychologists help institutions with hiring, managing, developing and supporting employees, while working to align employee efforts with business needs. Some intended outcomes of I-O psychology include effective management of organizational strategic goals, reduced turnover, increased productivity and improved employee engagement.

Prerequisite: completion of an English sequence (4 credits)

Science (SCIN)

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

SCIN3000 GEOLOGY - EARTH'S EVOLUTION

This course studies the geological processes that have made the Earth what it is today, including types of rocks and their origins, rock structures and component elements thus created, types and transportation of soils, groundwater occurrence and movement, and earthquake causes and ramifications. Laboratories will examine the different aspects of geological processes. **Prerequisites:** CHEM1100 (4 credits) Spring

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 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

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)

SOCL4232 RESEARCH METHODS

This course provides an introduction to the methodology of the social sciences. Major topics include: the logic of scientific inquiry, problem formulation, research design, conceptualization and measurement, techniques of data analysis, and ethical issues involved in the study of social phenomena. The primary objective is to cultivate skills that will enable students to understand the significance and the limitations of contemporary social research. *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)

SOCL4322 JUVENILE JUSTICE

The purpose of this course is to examine in some depth the unique aspects of the American juvenile justice system and theoretical explanations of delinquent behavior. Although some attention will be paid to the work on juvenile delinquency in other disciplines, emphasis is on research done from a sociological perspective. The course is divided into three thematic units: conceptual and methodological issues in the study of delinquency; control of delinquency; and explanations of delinquent behavior. *Prerequisite: 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) Graduate Only

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)

Writing (WTNG) Graduate Only

WTNG5700 ACADEMIC WRITING FOR GRADUATE STUDENTS

This course strengthens graduate students' writing skills by focusing on the genres and mechanics of graduate-level academic writing. Students will engage in self-guided tasks to analyze texts in their field to learn the genre conventions and textual features that are specific to their disciplines. Students will also work one-on-one with the course instructor to strengthen their editing and revision strategies to improve both organizational and sentence-level writing issues. (1 credit)

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2022-2023 ACADEMIC POLICY AND PROGRAM UPDATES

Change Area	Change Description	Date of Update or Effective Term
New Undergraduate Courses - BIOE	BIOE4500	Fall 2022
New Undergraduate Courses - COMP	COMP1010, COMP2010, COMP2110, COMP2210, COMP2540, COMP3010, COMP3210, COMP3220, COMP3225, COMP3480, COMP3510, COMP3610, COMP3620, COMP3725, COMP4110, COMP4225, COMP4310, COMP4725, COMP4760	Fall 2022
New Undergraduate Course - DATA	DATA3010	Fall 2022
New Undergraduate Courses - ENGR	ENGR1100, ENGR1201, ENGR1202, ENGR1203, ENGR1204, ENGR1205, ENGR1206, ENGR1207, ENGR1300, ENGR1401, ENGR1402, ENGR1403, ENGR1404, ENGR1405, ENGR1406, ENGR1407	Fall 2022
New Undergraduate Course - HIST	HIST4351	Fall 2022
New Undergraduate Courses - HUMN	HUMN4121, HUMN4330	Fall 2022
New Undergraduate Course - MATH	MATH1776, MATH1777, MATH1876, MATH1877	Fall 2022
New Undergraduate Course - POLS	POLS4482	Fall 2022
New Undergraduate Course - SOCL	SOCL4232	Fall 2022
New Graduate Courses - ARCH	ARCH7325, ARCH7375, ARCH8820	Fall 2022
New Graduate Courses - CIVE	CIVE7550	Fall 2022
New Graduate Courses - COMP	COMP5925, COMP5925, COMP6760	Fall 2022
New Graduate Courses - DATA	DATA5500, DATA6710	Fall 2022
New Graduate Courses - CONM	CONM7150, CONM7175	Fall 2022
New Graduate Courses - INTN	INTN6000	Fall 2022
New Graduate Courses - MATH	MATH5200, MATH5700, MATH5750	Fall 2022
New Graduate Courses - WTNG	WTNG5700	Fall 2022
New Undergraduate Programs	School of Computing and Data Science - BSIT- Information Technology	Fall 2022
Revised Undergraduate Program	School of Architecture and Design - BINT - Changes to MATH and PHYS requirement MATH1000 & PHYS1000	Fall 2022
Revised Undergraduate Program	School of Computing and Data Science - BCOS, BSCY, BSAM Changed to 7-week Calculus I & II MATH1776 & MATH1777	Fall 2022
Revised Undergraduate Programs	School of Engineering - New FY Curriculum All Majors: BSEN Concentrations Computer, Electrical, Biomedical, Civil & Mechanical have unique degree detail requirements	Fall 2022
New Graduate Program	School of Computing and Data Science - MSCA	Fall 2022
Revised Graduate Programs	School of Computing and Data Science - MSACS	Fall 2022
Revised Graduate Program	School of Management - MSCM	Fall 2022
New Minor	MCMG - Construction Manufacturing	Fall 2022
Revised Undergraduate Policy - Change of Major	New Deadline to Declare, Submit to Dean of Major to Begin the Process	Fall 2022
Revised Undergraduate Policy - Incomplete Grade	New Deadline for completion of coursework for pre-requisite courses	Fall 2022

Change Area	Change Description	Date of Update or Effective Term
Revised Undergraduate Policy - Request for Academic Reinstatement	Submit to Dean of major, Deadline to submit request	Fall 2022
Revised Undergraduate Policy - Declare a Minor	2.0 GPA, Deadline date to submit	Fall 2022
Revised Undergraduate Policy - Age of Credit	Transfer Credit completed 5 years or more prior to matriculation, not eligible for transfer to Wentworth	Fall 2022
Revised Undergraduate Policy - Military Connected Services	Withdrawal for Military Connected Services: Active Duty	Fall 2022
Revised Undergraduate Policy - JST Transcripts	Available to all undergraduate programs with school approval	Fall 2022
Revised Undergraduate Policy - Alternate Pin Code Semesters	Fall and Spring semesters only	Fall 2022

Refer to Undergraduate Academic Policy section of the catalog for the description of Revised or New Academic Policy.

PREVIOUS ACADEMIC CATALOGS

Click on the catalog below to view.

- 2021-2022 Academic Catalog PDF (https://catalog.wit.edu/previous-catalogs/2021-2022_Academic_Catalog_PDF.pdf) | HTML (<https://catalog.wit.edu/previous-catalogs/2021-2022/>)
- 2020-2021 Academic Catalog PDF (<https://catalog.wit.edu/previous-catalogs/2020-2021/pdf/WIT%202020-2021%20Academic%20Catalog.pdf>) | HTML (<https://catalog.wit.edu/previous-catalogs/2020-2021/>)
- 2019-2020 Academic Catalog PDF (<https://catalog.wit.edu/pdf/WIT%202019-2020%20Academic%20Catalog.pdf>) | HTML (<https://catalog.wit.edu/previous-catalogs/2019-2020/>)
- 2018-2019 Academic Catalog (https://catalog.wit.edu/previous-catalogs/2018-2019_Academic_Catalog_Final_update_5_101519.pdf)
- 2017-2018 Academic Catalog (https://catalog.wit.edu/previous-catalogs/WIT_2017-18_Academic_Catalog.pdf)
- 2016-2017 Academic Catalog (https://catalog.wit.edu/previous-catalogs/WIT_2016-2017_Academic_Catalog.pdf)
- 2015-2016 Academic Catalog (https://catalog.wit.edu/previous-catalogs/WIT_2015-2016_Academic_Catalog.pdf)
- 2014-2015 Academic Catalog (https://catalog.wit.edu/previous-catalogs/WIT_2014-15_Academic_Catalog_.pdf)
- 2013-2014 Academic Catalog (https://catalog.wit.edu/previous-catalogs/WIT_2013-14_Academic_Catalog_.pdf)
- 2012-2013 Academic Catalog (https://catalog.wit.edu/previous-catalogs/WIT_2012-13_Academic_Catalog.pdf)
- 2011-2012 Academic Catalog (https://catalog.wit.edu/previous-catalogs/WIT_2011-12_Academic_Catalog.pdf)
- 2010-2011 Academic Catalog (https://catalog.wit.edu/previous-catalogs/WIT_2010-11_Academic_Catalog.pdf)

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