
New York University
**Tandon School of
Engineering**

2016-2018 Bulletin

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New York University Tandon School of Engineering Mission Statement

To excel as a leading high-quality research university engaged in education, discovery and innovation with social, intellectual and economic impact in the New York region, the nation and the world.

To achieve this mission, we educate, discover and invent. We engage students seeking educational achievement and opportunity, faculty seeking excellence and relevance, and organizations seeking solutions and talent. We creatively bring intellectual rigor, technological innovation and a passion for science to the communities where we work and live and to the citizens of the world.

We innovatively extend the benefits of science, engineering, management and liberal studies to critical real-world opportunities and challenges, especially those linked to urban systems, health and wellness and the global information economy.

Our learning environment develops the skills to discover and invent, stimulates innovation and encourages entrepreneurship. We refer to this environment of invention, innovation and entrepreneurship as i2e. It is what has produced generations of thought leaders and action-oriented learners who are capable of thinking globally and across multiple disciplines.

General Information

The New York University Tandon School of Engineering bulletin is an official publication of NYU. It provides information about academic programs and a summary of School policies and procedures and selected activities and services. Information concerning admission, academic regulations and requirements, student services, academic offerings and a listing of administrative officers and faculty are included. Every effort has been made to publish a complete and accurate bulletin. However, requirements, deadlines, tuition, fees, curricula, courses and staffing are subject to change at any time without advance notice or obligation. Some course descriptions may vary from actual course content because of advancements in the discipline, emphasis of individual instructors or decisions of the faculty to change the scope or content of the course.

SCHOOL PROFILE

Introduction

The New York University Tandon School of Engineering (formerly the New York University Polytechnic School of Engineering, the Brooklyn Polytechnic Institute, the Polytechnic University, and the Polytechnic Institute of NYU, now widely known as the NYU Tandon) is the official engineering school of New York University. NYU Tandon School of Engineering, founded in 1854, is the nation's second oldest private engineering school. It is presently a comprehensive school of education and research in engineering and applied sciences, rooted in a 159-year tradition of invention, innovation, and entrepreneurship. It remains on the cutting edge of technology, innovatively extending the benefits of science, engineering, management and liberal studies to critical real-world opportunities and challenges, especially those linked to urban systems, health and wellness, and the global informational economy. In addition to its programs on the main campus in New York City at MetroTech Center in downtown Brooklyn, it offers programs around the globe remotely through its online courses. NYU Tandon School of Engineering closely connected to engineering in NYU Abu Dhabi and NYU Shanghai and to the NYU Center for Urban Science and Progress (CUSP) also at MetroTech, while operating three incubators in downtown Manhattan and Brooklyn.

Undergraduate programs in civil, computer, chemical, electrical and mechanical engineering are accredited by the Accreditation Board for Engineering and Technology (ABET). Degree and certificate programs listed in this bulletin are registered by the New York State Education Department.

History

Founded in 1854 as the Brooklyn Collegiate and Polytechnic Institute, the school originally educated young men, ages 9 to 22, and was located on Livingston Street in downtown Brooklyn. In 1889, the collegiate and preparatory departments separated, and the collegiate division adopted the name Polytechnic Institute of Brooklyn. The Institute, historically referred to as "Brooklyn Poly," moved its campus to Jay Street in 1957. In 1961, it opened a Long Island campus in Farmingdale as a graduate and research center.

In 1973, the New York University School of Engineering and Science merged into Polytechnic and the school was renamed the Polytechnic Institute of New York. The Institute began offering undergraduate programs at its Long Island campus in 1974 and, in 1975, opened the Westchester Graduate Center in Hawthorne. As a result of institutional realignment, the Hawthorne campus was closed in August 2013, and the Long Island Campus is only operating programs for continuing students, and will be closed as of May 2014.

In 1985, the New York State Board of Regents granted the institution university status and the official name became Polytechnic University.

The next 15 years saw a period of great activity as the University played a key part in the creation of MetroTech Center, a 16-acre, \$1.5-billion university-corporate park, which was built around Polytechnic's existing buildings and revitalized an area that had been in decline. Polytechnic updated its facilities, renovated its student-center building and built a new home for its library and for the Center for Advanced Technology in Telecommunications. The University also began to offer several programs in management of technology and financial engineering in the heart of Manhattan's high-technology and financial district.

During this time, the University launched the Campaign for Polytechnic - Fulfilling the American Dream - to raise \$275 million to transform itself into one of the nation's premier technological universities. In 1998, Polytechnic received a \$175 million bequest from the estates of Donald F. Othmer, a longtime Polytechnic professor, and his wife, Mildred. At that time, it was the largest single cash gift ever made to a private American university. In 1999, Polytechnic received its second largest contribution from alumnus and former student of Professor Othmer, Joseph J. Jacobs, who gave \$20 million.

In 2000, Polytechnic began construction on two new buildings on the MetroTech campus: the Joseph J. and Violet J. Jacobs Building, an eight-story academic and athletic facility with classrooms and laboratories and a full gymnasium; and the 20-story, 400-bed Donald F. and Mildred Topp Othmer Residence Hall, Polytechnic's first on-campus residence hall in Brooklyn. Both buildings opened in summer 2002. Since that time, the NYU School of Engineering has expanded into all four sides of MetroTech, while enhancing its existing facilities.

In 2008 the University entered into a formal affiliation with New York University in recognition of the synergies between engineering, science, technology, medicine, dentistry, public policy, law and the arts. It became known as the Polytechnic Institute of New York University, or informally as NYU-Poly, the affiliation has further enhanced its capability to prepare leaders to address the challenges of the 21st century. In 2012, the Board of Trustees of NYU and the Board of Trustees of NYU-Poly voted for the institutions to undertake the final set of steps necessary to complete the merger and make NYU-Poly NYU's School of Engineering. Since that time, key approvals, from state and accrediting authorities have put the merger on track. It was finalized as of January 1, 2014, at which point NYU-Poly became the newest school at NYU: the NYU Polytechnic School of Engineering.

The NYU Tandon School of Engineering delivers on-site and online programs locally and globally. NYU Tandon School of Engineering students also have the ability to study abroad at NYU's global sites and other affiliated international universities.

Academic Programs

The NYU Tandon School of Engineering offers a Bachelor of Science degree in 15 disciplines, covering computer science, engineering, the physical sciences, mathematics, and liberal arts. A Master of Science is offered in 32 disciplinary specialties. A Master of Engineering in Interdisciplinary Studies in Engineering is offered with different concentrations. A Doctor of

Philosophy is offered in 11 disciplines.

Bachelor of Science programs prepare students for entry-level employment in various professional disciplines, and for study at an advanced level. Master of Science programs are oriented toward professional development in the subject area and can be arranged to provide the core coursework for PhD study. The PhD is the terminal research degree for those who seek careers in industrial or academic research. The degree requires an independent research dissertation that advances the state of the art in the discipline of study. Details of academic degree requirements and detailed program descriptions are given in “Academic Programs” section of this bulletin.

Academic Departments

The School faculty is grouped into academic departments for administrative purposes. Each degree program is planned and administered by the faculty of a department (or, in some cases, by faculty from several cooperating departments). Academic departments manage instructional laboratories and most research laboratories.

The “Academic Departments” section of this bulletin describes the faculty and facilities of the following ten academic departments, and identifies the degrees that each department supervises.

- Applied Physics
- Chemical and Biomolecular Engineering
- Civil and Urban Engineering
- Computer Science and Engineering
- Electrical and Computer Engineering
- Financial and Risk Engineering
- Mathematics
- Mechanical and Aerospace Engineering
- Technology, Culture and Society
- Technology Management and Innovation

Research at the NYU Polytechnic School of Engineering

The NYU Tandon School of Engineering offers major research programs in experimental, theoretical and computational areas, leading to significant contributions in the advancement of technology. The NYU Tandon School of Engineering faculty continue to excel as world leaders in areas that include power engineering, electromagnetics and wave propagation, wireless communication and networks, telecommunication and distributed information systems, cybersecurity, data management, software engineering and development, polymer chemistry and engineering, dynamical systems, smart materials, biomaterials, bioengineering, engineered interfaces, plasma science and technology, sensors and sensor systems, urban engineering relating to urban infrastructure, resiliency, and smart cities.

Future Labs and Accelerators

As the innovation economy emerges around the world, New York City has been diversifying its efforts to nurture a fast-growing sector of technology companies. The NYU Tandon School of Engineering operates three incubators for early-stage startups with a network of support services and programs, which are a key component of the school's strategy of i2e (invention, innovation and entrepreneurship). The incubators - located on Varick Street in Manhattan, DUMBO and the Urban Future Lab (UFL) on its main campus at 15 MetroTech Center in Brooklyn - provide guidance, expertise, and resources to entrepreneurs, helping their ventures grow, while attracting talent and funding to the School. The UFL is the School's hub for all cleantech related activities and houses ACRE, the Accelerator for a clean and Renewable Economy, and PowerBridgeNY, a cleantech proof-of-concept center. The incubators are a public-private-academic partnership where young entrepreneurs are nurtured by university partners with support from government and the private sector. They provide startups with administrative support in addition to access to talent, markets, capital, research and resources.

Intellectual Property

The School's written policy on intellectual property governs the rights, benefits and releases related to faculty and student project work. The policy is available from the NYU Office of Industrial Liaison.

Faculty

The heart of the NYU Tandon School of Engineering is its teaching and research faculty. There are more than 150 full-time faculty, in addition to adjunct faculty, teaching and research assistants, scientists and postdoctoral and special fellows. The NYU Tandon School of Engineering faculty is committed to providing the best possible educational environment to stimulate and develop the mind-set of inventors, innovators and entrepreneurs in the classroom and in the laboratory, through individual guided studies and projects, advising and strong one-on-one relationships with students. The faculty originates, organizes and approves all curricula taught at the School and also establishes academic standards for student performance.

Alumni

The NYU Tandon School of Engineering Alumni Association (PIAA), which traces its roots to 1863, promotes the welfare of alumni and the Institute through the support and advancement of continuing education, communication, fundraising, student recruitment and retention and fellowship among alumni. The association is governed by an elected Executive Council and an International Board of Directors. The NYU School of Engineering's more than 33,000 living alumni can be found in all 50 states and at least 64 countries.

The PIAA, coordinating with the Office of Development & Alumni Relations, provides unique

engagement opportunities that benefit alumni worldwide, including international and regional alumni gatherings and various networking and social programs organized by class year, discipline, affinity and other criteria.

Each year, the PIAA recognizes alumni accomplishments with the Distinguished Alumni Award, Dedicated Alumni Award and Outstanding Graduate Award, which are presented during Commencement and other prestigious events.

NYU Tandon School of Engineering alumni are encouraged to take advantage of a number of services and benefits available through the Office of Alumni Relations. Benefits include the opportunity to audit NYU School of Engineering courses at reduced tuition, use of the Bern Dibner Library of Science and Technology, access to online job listings through NYU CareerNet, the services of the Wasserman Center for Career Development | Brooklyn, use of the NYU Federal Credit Union, access to the NYU Travel Adventures program, as well as discounted life, health, auto and home insurance programs. As the newest members of the NYU alumni firmly, NYU Tandon School of Engineering alumni also enjoy benefits and services which may be found by visiting <http://alumni.nyu.edu/s/1068/2col.aspx?sid=1068&qid=1&pgid=254>.

Site

Brooklyn

NYU Tandon School of Engineering's campus is in the center of downtown Brooklyn, a vibrant residential and business community and cornerstone of the emerging "Brooklyn Tech Triangle". The campus forms the nucleus of MetroTech Center, the largest urban university-corporate park in the United States. Developed in 1982, the 16-acre, \$1-billion complex features a tree-lined commons and pedestrian walkways and is home to several technology-dependent companies that have fostered research and employment relationships with the Institute. Its academic buildings create an environment that facilitates faculty, student and staff interactions in laboratories, project space and study space, which together encourage invention, innovation and entrepreneurial activities both in and outside the classroom.

- Rogers Hall, the main academic building, is named after the late Harry S. Rogers, NYU School of Engineering's fifth president (1933-57). The building houses faculty and department offices, classrooms, research and teaching laboratories and a cafeteria, dining hall, student lounge, and a new students "ideation" and collaboration space called the Greenhouse.
- Bern Dibner Library of Science and Technology opened in 1992, provides 128,000 square feet of academic and student services space. The building houses several key elements of the Institute: a state-of-the-art library, named after the late Bern Dibner '21 Hon'59, an alumnus, trustee and benefactor; computer laboratories; the Departments of Technology Management and Innovation, Technology, Culture and Society, and part of the Electrical and Computer Engineering department; the center for Faculty Innovation in Teaching and Learning; and the Expository Writing Program, administered by NYU. The second floor of the building houses the Student Services and Support Center, providing students convenient

access to the services they need - all under one roof. Opened in 2012, the center provides: Student Affairs, Student Clubs, a small Student Lounge, International Students and Scholars, and Counseling Services, the Registrar and Student Financial Services one-stop shop; and Undergraduate Programs Offices, including Advisement, Special Services/TRIO, HEOP, and General Studies (GS).

- Joseph J. and Violet J. Jacobs Academic Building, opened in 2002, honors the late inventor, innovator and entrepreneur Dr. Jacobs '37 '39 '42 Hon'86, founder of Jacobs Engineering Group, former chairman of the Board of Trustees, and his wife. The eight-story building, the main entrance to the School, contains lecture halls; laboratories for chemistry, biology and environmental engineering; and "smart" classrooms wired for multimedia technologies. The building also features a full multipurpose gymnasium, including a fitness center and basketball court.
- 2 MetroTech Center recently became a new hub for the entire Computer Science and Engineering (CSE) Department and part of the Electrical and Computer Engineering (ECE) Department. NYU School of Engineering's space in the building is split among three floors - a dedicated ground-floor lobby, the entire 10th floor and a portion on the 9th floor. The 50,000 square foot space on the building's 10th floor, opened in January 2012, includes: 47 faculty and researcher offices, more than a dozen computational laboratories, work stations for post-docs and student researchers, and department administration and advising offices. A pantry and break room adjacent to the glass-enclosed data monitor room offers a view of the lab conducting research on data analysis and visualization. The 35,000 square feet on the building's 9th floor underwent renovations to create three, large-capacity classrooms, new permanent homes for the Center for Advanced Technology in Telecommunications (CATT) and NYU WIRELESS, the largest National Science Foundation-funded academic/industry cooperative research center. The 9th floor space was substantially completed in January 2013. In the fall of 2013, New York University is launching the Media and Games Network (MAGNET), on the 8th floor of 2 MetroTech Center that will bring together NYU School of Engineering faculty and faculty from other schools of NYU whose teaching and research bridge technology and culture.
- Donald F. and Mildred Topp Othmer Residence Hall, opened in 2002, honors the late Dr. Othmer, a long-time professor of chemical engineering and prolific inventor (1932-76) and his wife. The 20-story building houses more than 400 students in two-bedroom suites and two-bedroom apartments with kitchenettes and data, voice and cable television ports for every student. The building includes student lounges, study rooms, laundry facilities, health offices and storage space.
- Joseph W. and Samuel Wunsch Hall is housed in a historic landmark. Anchoring the third side of the MetroTech campus, it was built in 1846. This Greek Revival building was the home of the African Wesleyan Methodist Church, the first black congregation in Brooklyn and was a stop on the Underground Railroad. It was authentically restored and reopened in 1996 through the generosity of the Wunsch family, in memory of two entrepreneurial brothers and alumni Joseph '17 and Samuel Wunsch '29. The building houses the Office of Undergraduate and Graduate Admissions.
- 15 MetroTech Center, 6th floor, is home to the administrative functions of the NYU School of Engineering including: the Office of the President, Office of Sponsored Research,

Information Technology, Finance and Business Affairs, Human Resources, Development and Alumni Relations, Enterprise Learning and ePoly, Marketing & Communications and Web & Media Services. In the fall of 2013, NYU School of Engineering will open a 10,000 square foot incubator on the 19th floor of 15 MetroTech Center, a project supported by the NYC Economic Development Corporation.

55 Broad Street, Manhattan Programs

Located in the heart of New York City's high-technology and financial district, School of Engineering's 55 Broad Street site allows the Technology Management Department to serve the area's burgeoning population of technology managers, financial experts, entrepreneurs and other professionals.

Master's degrees offered at this site through the Department of Technology Management include Accelerated Management of Technology and Management of Technology, along with an Information Management Master's degree program taught in an executive-degree format. The 55 Broad Street site also houses the Department's Institute for Technology and Enterprise (ITE). ITE presents seminars and roundtables on various subjects related to modern technology management and supports research and advanced curriculum development for graduate and executive master's programs dealing with technology and innovation management and entrepreneurship.

Global Outreach

In addition to its programs on the main campus in downtown Brooklyn, the School of Engineering offers programs around the globe remotely through online courses. NYU School of Engineering is closely connected to engineering in NYU Abu Dhabi and NYU Shanghai as well as to the NYU Center for Urban Science and Progress (CUSP) also located at MetroTech, while operating three incubators in downtown Brooklyn and Manhattan. In addition, as discussed throughout, students and faculty enjoy many opportunities to take advantage of the resources and broader community in Manhattan at Washington Square and along the Medical Corridor on First Avenue and around the globe.

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Civil and Urban Engineering

EVGENY VULFSON

Industry Professor
Chemical and Biomolecular Engineering

YAO WANG

Professor
Electrical & Computer Engineering

PENGFEI WANG

MENG WANG

YIN WANG

PhD Candidate
Civil and Urban Engineering

ZHU WANG

QI WANG

Ph.D. Candidate
Computer Science and Engineering

EDWARD WEIL

Research Professor
Polymer Research Institute

JOEL M. WEIN

Associate Professor
Computer Science and Engineering

EDWARD WEINBERGER

Adjunct Professor
Financial Engineering

KLAUS-DIETER WELTMANN

Visiting Professor
Applied Physics

RICHARD ELLIOT WENER

Professor of Environmental Psychology
Technology, Culture and Society

JOSHUA WEXLER

Adjunct Professor

SUNG WHANG

Professor
Mechanical Engineering

JEROME B. WHITE, P.E.

Adjunct Professor
Civil Engineering

ALFONSO WHU

Adjunct Professor
Civil and Urban Engineering

JAMES WIELAARD, PhD

Industry Associate Professor
Mathematics

GABRIEL WINER

Adjunct Faculty
Technology, Culture & Society

FRED WINTER
Adjunct CIS
Computer Information Sciences

EDWARD WOLF
Professor
Applied Physics

EDWARD K. WONG
Associate Professor
Computer Science and Engineering

CARMEN WONG-ULRICH
IACP Fin/Risk Eng 9m
Finance & Risk Engineering

WUPING XIN, Ph.D., PE
Adjunct Faculty
Civil and Urban Engineering

ZHAOXIA XU
Assistant Professor
Finance and Risk Engineering

YANG XU
Research Associate Professor
Electrical & Computer Engineering

TIANTIAN XU
Polytechnic Institute of NYU
Computer Science

LOK YAN
Adjunct Faculty
Computer Science and Engineering

YISONG YANG
Professor
Mathematics

DEANE YANG
Professor, Deputy Department Head
Mathematics

SUNG-HO YOON
Research Scientist
Civil Engineering

DANTE C. YOULA
NYU School of Engineering Presidential
Fellow and Professor Emeritus
Department of Electrical and Computer
Engineering

BOWEN YU

ZIVAN ZABAR
Professor
Electrical & Computer Engineering

GAOYONG ZHANG
Professor
Mathematics

QI ZHANG
Ph.D candidate
Chemical and Biomolecular Engineering

PEIJI ZHAO
Research Assistant Professor
Applied Physics

ADMINISTRATIVE OFFICES

Academic Advisement Center

<http://engineering.nyu.edu/academics/support/academic>
Tel.: (646) 997-3980
Hours: Monday-Friday 9am-5pm

Alumni Relations

<http://engineering.nyu.edu/alumni>
Tel.: (646) 997-3885 or 800-FON-POLY
Fax: (646) 997-3449
E-mail: engineering.alumni@nyu.edu
Hours: Monday-Friday, 9am-5pm

Athletics

http://www.gonyuathletics.com/splash.aspx?id=splash_57
Tel.: (646) 997-3453
Fax: (646) 997-3473
Hours: Monday-Friday, 9am-5pm
GYMNASIUM/FITNESS CENTER
Hours: Monday-Friday, 11am-9:30pm;
Sat. & Sun., 12pm-7pm

Bern Dibner Library of Science and Technology

www.poly.edu/library
Tel.: (646) 997-3530
Fax: (646) 997-3756
E-mail: blibrary@poly.edu
Hours: Monday-Friday, 8:30am-1am;
Sat.-Sun., 10am-11pm

Bursar

<http://www.nyu.edu/life/resources-and-services/nyu-studentlink/bills-payments-and-refunds.html>
Tel.: (212)998-2806
Fax: (212)998-2817
E-mail: bursar.studentaccounts@nyu.edu
Hours: Monday, Tuesday, Friday, 9am -5pm;
Wednesday, Thursday, 9am-6pm

Manhattan Programs, 55 Broad St.

<http://engineering.nyu.edu/about/manhattan-directions>
Office: 55 Broad Street, Suite 13B
New York, NY 10004
Tel.: (646) 997-4015
Fax: (212) 547-7029
E-mail: [http://vvivek@nyu.edu](mailto:vvivek@nyu.edu)
Hours: By appointment only

NYU Tandon Future Labs

<http://engineering.nyu.edu/business/future-labs>
137 Varick Street - 2nd Floor NY, NY 10013
Tel.: (212) 292-3123
Fax: (212) 206-9190

20 Jay Street - Suite 312 Brooklyn, NY 11201
Tel.: (718) 407-6561

15 MetroTech Center - 19th Floor Brooklyn, NY 11201
Email: incubator@poly.edu
Hours: Monday - Friday 9am-5pm

Office of Global Services

<http://nyu.edu/ogs>
Tel.: (646) 997-3805
Fax: (646) 997-3710
E-mail: Online Form
Hours: Monday-Friday, 9am-5pm

Office of Sponsored Research

<http://engineering.nyu.edu/research/sponsored-research>
Tel.: (646) 997-3360
Fax: (646) 997-3063
Hours: Monday-Friday, 9am-5pm

Polytechnic Tutoring Center

<http://engineering.nyu.edu/academics/support/polytec>

CATT/WICAT

www.catt.poly.edu
Tel.: (646) 997-3050 / (646) 997-3856
Fax: (646) 997-3074
E-mail: wicat@poly.edu
Hours: Monday-Friday, 9am-5pm

Counseling and Psychological Services

<https://www.nyu.edu/life/safety-health-wellness/student-health-center/services/mental-health.html>
Tel: (646) 997-3456
Tel.: (646) 997-3537 (for emergencies)
Email: wellness.exchange@nyu.edu
Hours: Monday-Thursday, 9am-8pm Friday, 9am-5pm

Center for K-12 Stem Education

<http://engineering.nyu.edu/k12stem>
Tel.: (646) 997-3524
Fax: (646) 997-3733
E-mail: ben.esner@nyu.edu
Hours: Monday-Friday, 9am-5pm

Client Services Center

<https://www.nyu.edu/fcm/workrequestform/>
Tel: (212) 998-1001
E-mail: contactcsc@nyu.edu
Hours: Monday-Friday, 8am-5pm

Faculty Innovations in Teaching and Learning

<http://engineering.nyu.edu/academics/support/fitl>
Tel.: (646) 997-3625
E-mail: yjeanpie@nyu.edu
Hours: Monday-Friday, 9am-5pm

Financial Aid

<http://www.nyu.edu/admissions/financial-aid-and-scholarships.html>
Tel.: (212) 998-4444
Fax: (212) 995-4661
E-mail: financial.aid@nyu.edu
Hours: Monday, Tuesday, Friday, 9am-5pm;
Wednesday, Thursday, 9am-6pm

hnic
Tel.: (646) 997-3425
E-mail: polytechnictutoring@nyu.edu
Hours: Monday-Thursday, 10am-6pm;
Friday, 11am-5pm

Print Shop

<http://engineering.nyu.edu/mail>
Tel.: (646) 997-3367 Fax: (646) 997-3136
E-mail: polyprintshop@nyu.edu
Hours: Monday-Friday, 8am-5pm

Records + Registration

<http://engineering.nyu.edu/life/student-resources/records-and-registration>
Tel.: (646) 997-3486
Email: poly.registration@nyu.edu
Hours: Monday-Friday, 9am-5pm

Registrar

<https://www.nyu.edu/registrar/>
Tel.: (212) 998-4800
Fax: (212) 995-4154
E-mail: Online Contact Form
Hours: Monday-Friday, 9am-5pm

Residence Life

<http://www.nyu.edu/life/living-at-nyu.html>
Tel.: (212) 998-4600
E-mail: housing@nyu.edu
Hours: Monday-Friday, 9am-5pm

Security

<http://engineering.nyu.edu/life/campus-safety>
Dibner Building - Tel.: (646) 997-3727
RH Front Entrance - Tel.: (646) 997-3537
RH Rear Entrance - Tel.: (646) 997-3213
WH Entrance - Tel.: (718) 637-5901
2 MTC Entrance - Tel.: (646) 997-3922
15 MTC Entrance - Tel.: (718) 312-7777

Student Activities

<http://engineering.nyu.edu/life/studentactivities>
Tel.: (646) 997-3800 Fax: (646) 997-3917
E-mail: nyuengrosarc@nyu.edu

Freshman Programs

Tel.: (646) 997-3391
E-mail: mparham@nyu.edu
Hours: Monday-Friday, 9am-5pm

General Studies (GS) Program

<http://engineering.nyu.edu/academics/support/general-studies>
Tel.: (646) 997-3882
E-mail: General Studies Ask Us Online Form
Hours: Monday-Friday, 9am-5pm

Graduate Center

<http://engineering.nyu.edu/admissions/graduate/>
Tel.: (646) 997-3182
Fax: (646) 997-3426
E-mail: gradcenter@poly.edu
Hours: Monday-Friday, 9am-5pm

Higher Education Opportunity Program (HEOP)

<http://engineering.nyu.edu/academics/support/heop>
Tel.: (646) 997-3370
Fax: (646) 997-4135
E-mail: heop@poly.edu
Hours: Monday-Friday, 9am-5pm

Honors Program

<http://engineering.nyu.edu/academics/honors>
Tel.: (646) 997-3665
Fax: (646) 997-3896
E-mail: uga.engineering@nyu.edu
Hours: Monday-Friday, 9am-5pm

Human Resources

<http://engineering.nyu.edu/services/human-resources>
Tel.: (646) 997-3840
Fax: (646) 997-3981
E-mail: hr@poly.edu
Hours: Monday-Friday, 9am-5pm

Hours: Monday-Thursday, 9am-6pm; Friday, 9am-5pm

Student Affairs

<http://engineering.nyu.edu/life/student>
Tel.: (646) 997-3137 Fax: (646) 997-3197
E-mail: studentaffairs@poly.edu
Hours: Monday-Friday, 9am-5pm

Student Advocacy

<http://engineering.nyu.edu/life/student-affairs/advocacy-privacy-and-compliance>
Tel.: (646) 997-3046 Fax: (646) 997-3197
E-mail: <http://js6244@nyu.edu>
Hours: Monday-Friday, 9am-5pm

TRIO Scholars Program

<http://engineering.nyu.edu/trioscholars>
Tel.: (646) 997-3560 Fax: (646) 997-3945
E-mail: trionyupoly@gmail.com
Hours: Monday-Friday, 9am-5pm

Undergraduate Academics

<http://engineering.nyu.edu/academics>
Tel.: (646) 997-3847 Fax: (646) 997-3896
E-mail: <http://uga.engineering@nyu.edu>
Hours: Monday-Friday, 9am-5pm

Undergraduate Admissions

<https://www.nyu.edu/admissions/undergraduate-admissions.html>
Tel.: (212) 998-4500
E-mail: admissions@nyu.edu
Hours: Monday-Friday, 9am-5pm, Saturday, 10am-4pm, 10am-4pm April-October

Wasserman Center for Career Development | Brooklyn

<https://www.nyu.edu/life/resources-and-services/career-development.html>
Tel.: (718) 260-3650 Fax: (718) 260-3325
E-mail: career.development@nyu.edu

Information Systems

<http://engineering.nyu.edu/services/information-technology-systems>

Tel.: (718) 260-3123

E-mail: help@poly.edu

Hours: Monday-Friday, 9am-5pm

Jasper H. Kane Dining Hall

<http://www.dineoncampus.com/nyupolytechnic/idx.cfm>

Tel.: (646) 997-3786

Fax: (718) 875-0509

E-mail: catering@poly.edu

Hours: Monday-Thursday, 7:30am-9pm;

Friday, 7:30am-6pm, Sat.-Sun., 11am-6pm

Mailroom

<http://engineering.nyu.edu/mail>

Tel.: (646) 997-3396 Fax: (646) 997-3136

E-mail: mailservices@nyu.edu

Hours: Monday-Friday, 8am-5

Hours: Academic Year: Monday-Friday, 9am-5pm;
Wednesday, 9am-7pm

Summer/Winter Break: Monday-Friday, 9am-5pm;
Wednesday 9am-7pm

Web and Media Services

Tel.: (718) 260-3971

Fax: (718) 260-3756

E-mail: support@webteam.poly.edu

Hours: Monday-Friday, 9am-5pm

COMMUNICATION POLICY

In our continuing campaign to be environmentally aware by “going green” and to increase the safety, efficiency, and speed of our communication with students, NYU School of Engineering has instituted a communication policy in which it will no longer use paper communication with students.

All School of Engineering students have a NYU e-mail account and, through the NYU Classes integration, access to NYU Home for institutional information concerning the classes for which they are registered and organizational information and services. Because of this robust electronic access, NYU faculty and administration will contact students with important information and notices electronically only through the various communication technologies and environments provided by the University.

To ensure that students both receive and are responsive to important notices from all departments and offices at the School, students need to observe the following policy:

- The NYU e-mail accounts are student’s official point of contact. Students are expected to directly access this account at least once each school day. Visit <https://www.nyu.edu/its/email/> for more information and assistance.
- Students must be aware of notices posted on their NYU Home Pages. It is the student’s responsibility to check this portal during the drop/add period of registration and regularly during the term in order to verify the accuracy of his/her schedule and to read any official university notices. Schedules should be verified by students at least once during the first two weeks of the term and once after mid-semester via Albert.
- The university calendars that delineate the different registration periods are also available online on the Registrar’s website. Students should be familiar with these calendars and adhere to the dates accordingly.
- Students are required to be aware of course-related information available on their course environment on NYU Classes, such as course syllabi, resources, calendar, assignment expectations, special announcements, grades etc.

SCHOOL COMPLIANCE AND OTHER GUIDELINES

School Compliance and Other Guidelines

Most issues of compliance are adjudicated through the Office of Community Standards. Please consult the following links: <http://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/governance-legal.html>. You will find a number of links, alcohol and drugs, for example, which you can then follow. The contact person is Thomas Grace (thomas.grace@nyu.edu).

Please note that any issues of sexual misconduct have their own link: <http://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/sexual-misconduct-relationship-violence-and-stalking-resource.html>. The contact person is Mary Signor: mary.signor@nyu.edu.

Academic misconduct is handled at the Tandon School of Engineering, and is usually initiated at the departmental level. Please check: <http://engineering.nyu.edu/life/student-affairs/code-of-conduct>. The contact person is Judith Simonsen: js6244@nyu.edu.

Family Educational Rights and Privacy Act (FERPA)

FERPA (Family Educational Rights and Privacy Act) is a federal law that protects the privacy of student educational records. It applies to all Schools receiving funds under an applicable program. FERPA rights transfer to a student when they are 18 years of age or they attend a school past high school. Students may choose to waive their FERPA protections by signing a waiver form in person at the Registrar's office.

Please consult: <https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/FERPA.html>

Alcohol and Drugs

A detailed description of prohibitions in regards to the above is available at: <https://www.nyu.edu/life/student-life/student-communitystandards/university-student-conduct-policies.html>

Health Insurance

All students must have medical insurance. Students with 9 or more credits are automatically enrolled; students with 1 or more credits may choose to enroll. If a student already has medical coverage, they will need to provide proof of their comparable coverage online.

Please consult: <https://www.nyu.edu/life/safety-health-wellness/student-health-center/services/services-for-nyu-poly-students.html>

International students, please also consult: <https://www.nyu.edu/life/safety-health-wellness/student-health-center/insurance-patient-accounts/student-health-insurance/international-students.html>

Immunization

New York State law requires students to show proof of immunity to measles, mumps and rubella. NYU School of Engineering complies fully with the provisions of this law. The law applies to all students (graduate and undergraduate) born on or after January 1, 1957.

Immunization status is checked as part of registration for new students. New first-year, transfer and graduate students who fail to comply (1) are barred from attending class (and are not entitled to any tuition refund); (2) do not receive grades; and (3) are denied further registration.

Please consult: <http://engineering.nyu.edu/services/health/immunization>

Student Identification

All students are required to carry and maintain photo-identification cards at all times on and around the various NYU sites.

To get an NYU ID, please consult: <https://www.nyu.edu/life/resources-and-services/nyu-card-and-campus-cash/get-an-nyucard.html>

To report a lost card, please consult: <https://www.nyu.edu/life/resources-and-services/nyu-card-and-campus-cash/get-an-nyucard/report-lost-card.html>

STATISTICS ON ENROLLMENT AND THE STUDENT BODY

Enrollment 2015-2016

Fall 2015

	Undergraduate			Graduate			Total
	FT	PT	TOT	FT	PT	TOT	
Brooklyn	2232	112	2344	2253	532	2785	5129
Broad Street	-	-	-	49	34	83	83
Total	2232	112	2344	2114	754	2868	5212

Student Body

Fall 2015

	Undergraduate		Graduate	
	Men	Women	Men	Women
Brooklyn	1689	655	2066	719
Broad Street	-	-	48	35
Total	1689	655	2114	754

Persistence and Completion Information

As required by the New York State Education Department Higher Education Data System, the NYU Tandon School of Engineering conducts a yearly cohort survival analysis. This study collects data for a group or cohort of first-time, full-time first year (never attended college before) students who enter the School. The data measures retention patterns and indicates the time needed to complete undergraduate degrees at the NYU School of Engineering. For a cohort study of first-time full-time students who entered the School of Engineering as first year students in Fall 2006, 41 percent received their Bachelor of Science degree within four years, 58 percent graduated in five years and 62 percent completed their degree within six years.

Student Retention

First-time full-time undergraduate students continuing at the School, 2014-2015 to 2015-2016:

School-wide: 86%

Enrollment by Racial/Ethnic Status (Using standard federal classifications)

	Undergraduate Students	Graduate Students
American Indian or Alaska Native	0.1%	0.1%
Asian, Pacific Islander	36.2%	5.9%
Caucasian	22.6%	9.1%
Black, non-Hispanic	5.2%	2.2%
Hispanic	9.7%	2.2%
International*	14.5%	77.6%
Unknown	11.5%	3.1%

**International students come from more than 55 countries*

ADMISSIONS, FINANCIAL AID, TUITION AND FEES

Admissions

The courses of study at NYU Tandon School of Engineering are academically rigorous and intellectually challenging; therefore, admission is highly selective. Candidates for admission to graduate programs are evaluated by the department to which they apply. Students seeking admission to the undergraduate programs are evaluated by the professional staff of the Office of Undergraduate Admissions.

Undergraduate Application Process

Application materials and information about undergraduate admissions may be obtained by contacting the Admissions Office. Please visit the NYU Admissions website for more information.

Undergraduate applicants should complete the Common Application for admission and forward it to the Office of Undergraduate Admissions at New York University with either the nonrefundable application fee or a fee-waiver request form. Applicants must request that their secondary school and/or college forward official copies of all transcripts to the NYU Office of Undergraduate Admissions. Additionally, applicants must submit an essay and two letters of recommendation. All freshman applicants must meet standardized testing requirements, which are available on the Undergraduate Admissions website. Transfer applicants may have standardized testing requirements as well.

New York University's Office of Undergraduate Admissions reviews applications once all required documents are received and notifies students of decisions via email.

If accepted for admission, applicants should submit an enrollment deposit of \$500 to reserve a place in the entering class. This deposit is applied to tuition and fees for the first semester and is non-refundable. Deposits to reserve a place in the entering freshman class are due May 1. Deposits to reserve a place for entering transfer students specified on the admission letter. Students who submit deposits after the deadline will be accommodated only if space in the class is available for the semester.

Applicants accepted for the fall semester may begin their studies in the summer session by completing a visiting student admission application after receiving their official offer of admission. NYU School of Engineering offers two summer sessions to help students who wish to accelerate or supplement their studies, but students are not expected to officially matriculate as degree-seeking candidates until the Fall.

Admission as First Year Students

Requirements

Applicants for admission as freshmen are required to submit standardized test results to be considered for admission. Please see the NYU admissions website for specifics on the testing policy. Students who are admitted to the NYU Tandon School of Engineering and plan on enrolling are required to take two placement examinations before registration.

The preferred secondary school course of study is:

Course	Years
English	4
Science	4
<i>(Chemistry is required and Physics is strongly recommended.)</i>	
Mathematics	4
<i>(Sequential I, II, III, precalculus, calculus)</i>	

This course of study is only a directive, not an absolute requirement. The primary concern of the members of the Committee on Admissions is to determine an applicant's potential for success at the NYU Tandon School of Engineering.

First Year Students with Advanced Standing

Incoming first year students may receive advanced standing with college credit at NYU Tandon School of Engineering by scoring exceptionally well on the Advanced Placement Examinations given by the College Board. Specific requirements for administering college credit - for the Advanced Placement and the International Baccalaureate Exam, for the French Baccalaureate or for the General Certificate Exam A levels, etc. - vary from department to department.

Admission under the General Studies Program

Admission to the General Studies Program is by invitation only. Selected first-year applicants to the NYU Tandon School of Engineering are invited to submit an application and may be interviewed by an admissions counselor to determine if their goals correspond with program objectives and services.

Academic Support Services

GS students have an array of services to help them adjust to the rigorous NYU School of Engineering curriculum. Services include, but are not limited to, the following:

- A six-week on-site or online summer program before the start of their first year.

- On-site students take a computer skills for engineering class and pre-college math, physics, and writing courses. Otherwise, students take an online math course. NYU Admissions decides whether the student's summer experience will be on-site or online; regardless of format, student participation in one or the other is required for admission to the NYU School of Engineering in the fall.
- College survival skills course.
- Small group tutoring and exam review sessions.
- Individual and group advisement sessions.

Admission under the Higher Education Opportunity Program

The Higher Education Opportunity Program (HEOP) is funded by New York State to provide broad and varied educational instruction to capable students who, due to limited academic and financial resources, might otherwise not have the opportunity to attend NYU. Once admitted to the HEOP program, students receive financial assistance, counseling, tutoring, advisement, and other support services throughout their college career. HEOP's goal at the NYU Tandon School of Engineering is to retain and graduate students who are traditionally underrepresented in engineering and science.

Admission as an International Student

International students must meet the following criteria for admission to NYU School of Engineering and be eligible to receive a valid I-20 or DS-2019:

- Academic credentials (grades, certificates, degrees) must be assessed as suitable for entry to the specific NYU School of Engineering program. Transcripts must be submitted with official translations. One source for official translations is World Education Services at www.wes.org.
- Submission of standardized testing is required for first year student admission (www.nyu.edu/admissions/undergraduate-admissions/apply/freshmen-applicants/instructions/standardized-tests.html).
- The Test of English as a Foreign Language (TOEFL) or IELTS is required of all students whose native language is not English. This requirement may be waived, in some circumstances.
- Admitted international students applying for an F-1 or J-1 student visa are required to submit a signed and completed NYU Declaration and Certification of Finances (Affidavit of Support) accompanied by a bank statement signed by a bank official to receive an I-20 or DS-2019.
- Students holding F-1 or J-1 visas must enroll as full-time students.

If transfer credit is desired, candidates must include catalog or syllabus descriptions of courses completed. English translation must be provided where necessary. An official transfer-credit evaluation will be done, as soon as possible, after the student is admitted to NYU School of Engineering and meets with a member of the admissions staff and a departmental adviser.

Admission as a Transfer Student

The NYU Tandon School of Engineering welcomes transfer students from accredited colleges and universities, provided they have maintained a strong academic record. In addition to the Common Application transfer applicants must submit the following to be eligible for transfer admission at NYU:

- One Instructor Evaluation completed by a professor or instructor at the college/university level.
- Official test scores that meet the University requirements for Standardized Tests. Transfer applicants who have already completed at least one year of full-time college or university enrollment in liberal arts and science courses are exempt from having to submit standardized test results to NYU. International transfer applicants, however, must review the English language testing requirements, which apply to both freshman and transfer candidates. If the applicant has not already completed one full year of full-time college or university enrollment in liberal arts and science courses by the time the application is submitted, the same standardized testing requirements that are outlined by Undergraduate Admissions on the Standardized Tests page for Freshman Applicants must be met.
- The Common Application Registrar's Report submitted by an adviser or a school official who can verify previous or current enrollment at a college/university.
- Official college/university transcripts submitted directly by the college/university registrar at any and all institutions attended.
- The Common Application Final Report and secondary/high school transcript submitted directly by a counselor or school official at the secondary/high school attended. Please note: Secondary/high school transcript (or General Education Diploma) is required regardless of when the applicant graduated.

Once accepted, transfer students' credits will be evaluated to determine which are transferable. Students are required to submit their college catalog, and/or syllabi, describing courses under consideration for transfer credit.

All transfer credit evaluations must be completed before the end of the first semester in which the transfer student is enrolled at the NYU Tandon School of Engineering. Transfer credit is awarded on the basis of current standards and curriculum. Therefore, it is possible that credits NYU Tandon School of Engineering had previously awarded for courses taken at other universities may no longer be granted at this time. Transfer credit will not be considered for any course with less than a C grade. Any student who completes a course in residence at NYU Tandon School of Engineering for which transfer credit has already been granted will automatically forfeit the transfer credit for that course.

In certain instances, course requirements may be waived for students who demonstrate sufficient knowledge of specific course content through either oral or written examinations given by the department. When course requirements are waived, the student will not receive credit for

the course, but must substitute a more advanced course to satisfy the degree requirement.

The grades for transfer courses are not included in computing the NYU Tandon School of Engineering grade-point average. New transfer students may be admitted on a part-time or full-time basis and are required to take a mathematics diagnostic examination and a writing placement exam.

Admission as an Internal Transfer

If a student who currently attends another school of NYU would like to be considered for admission to NYU Tandon, he/she may utilize the online internal transfer application in Albert's Application Center.

In order to be eligible, students must be in at least their second semester of consecutive full-time study at their current NYU school or college. Students who have previously applied for an internal transfer and were denied admission must wait one full academic year before becoming eligible to reapply. Likewise, students who have already completed an internal transfer must wait one full academic year before applying for another.

There is no application fee for internal transfers. They may submit only one application at a time. Applications submitted after the stated application deadline will be considered only on a space-available basis. Visit the Internal Transfer website for more information.

Admission as a Part-Time Student

Students seeking a bachelor's degree may enroll on a part-time basis (11 credits or less). Part-time undergraduate students should be aware that it is not possible to complete a bachelor's degree program by attending only evening courses.

Regulations concerning subject requirements and admissions procedures are given in the section "Admissions as a First Year Student."

Following notification of acceptance, students are told when to contact the adviser of their major department. In some cases, this contact may be accomplished during registration.

Special and Visiting Status

Individuals interested in pursuing undergraduate coursework at the School of Engineering, must submit a visiting student application to the Office of University Programs. University Programs provides support and services to visiting students during all semesters, including Fall in NY, January Term, Spring in NY, and Summer Sessions. Additional information regarding available programs and the application process can be found on the NYU Visiting Students page.

Conditional Status

An undergraduate degree applicant who is required to demonstrate additional ability to pursue the program applied for is assigned conditional status. Conditions may include taking introductory level courses, limited courses per semester, or attainment of a specified grade-point average.

Status

Within the full-time and part-time classifications of undergraduate admissions are three status groups: regular, conditional and special/visiting student. A change in status from conditional to regular should be applied for when the conditions of admission are satisfied. A special or visiting student must file an application for undergraduate admissions with the Office of Undergraduate Admissions.

Readmission

NYU Tandon students who have not been in attendance for one semester or more and have not been granted an approved leave of absence (see “Leave of Absence”) must apply for readmission through the Office of Undergraduate Admissions. The student’s application for readmission will be sent to the student’s academic department for evaluation. The academic department in consultation with the Office of Academic Affairs determine whether the student is eligible to continue his/her studies at the School. If a former Tandon student has, in the meantime, engaged in coursework at another college or university, a transfer application must be filed for admission consideration.

Students who have been academically disqualified must apply for readmission through the Office of Undergraduate Admissions. Students applying for readmission are expected to state their reasons for leaving Tandon and explain why they want to return. They must also submit with their application for readmission official transcripts of college-level courses taken during this absence from the Tandon School of Engineering.

Graduate Admissions

The Office of Graduate Enrollment Management and Admissions (Wunsch Hall, Brooklyn NY 11201, (646) 997-3182) manages all graduate application requirements and processes for the Tandon School of Engineering and reserves the right to change requirements at any time in consultation with the Associate Dean for Graduate Academics. The guidelines and requirements in this catalog and on the Graduate Enrollment Management and Admissions website supersede graduate admissions information posted or referenced elsewhere.

To be eligible for admission as a graduate student, an applicant must first hold a bachelor’s degree from an accredited institution acceptable to the NYU Tandon School of Engineering comprised of at least four years of post-secondary work. An applicant applying to a graduate

program in an area of study different from the field in which an undergraduate degree was earned may be required to take additional prerequisite courses (see “Conditional Status”).

Admission Procedures

All applicants for graduate study must submit:

- Graduate application and application fee submitted by published deadline
- Two letters of recommendation
- A Statement of Purpose
- A resume / C.V.
- Required official standardized test scores sent from testing organization(s)
- Official transcripts from all previously-attended post-secondary institutions

Documents that must be mailed should be sent to NYU Polytechnic School of Engineering, Graduate Admissions Processing Center, 15 Dan Road, Suite 102, Canton, MA 02021.

Application Deadlines

Application deadlines for each semester are published on the Office of Graduate Enrollment Management and Admissions website at <http://engineering.nyu.edu/grad/>.

Graduate Admissions Examinations

The Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT) is required for all applicants for admission to all doctoral programs and all full-time Master’s and Certificate programs, with the exception of the M.S. in Integrated Digital Media. GMAT scores may be used only for certain programs offered by the Department of Technology Management and Innovation. Some part-time Master’s and Certificate programs also require these examinations; a complete list of exam requirements by program can be found on the Office of Graduate Enrollment Management and Admissions website at <http://engineering.nyu.edu/grad/>.

English Language Proficiency

All applicants to the NYU Tandon School of Engineering for graduate study must demonstrate excellent English language skills in reading, writing, speaking and comprehension. Proficiency will be determined by the TOEFL (Test of English as a Foreign Language), IELTS (International English language Testing System), CAE (Cambridge Advanced English) or PTE (Pearson Test of English) Academic exams. The Office of Graduate Enrollment Management and Admissions reserves the right to request proof of English competency from any applicant. At least one of these exams is required for:

All International applicants (those who have or will request a visa)

Applicants (including US citizens and US Permanent Residents) who have not completed a

bachelor's degree in the United States.

Applicants may request a waiver of English language testing by submitting a request form to the Office of Graduate Enrollment Management and Admissions prior to the posted application deadline (this form is available at <http://engineering.nyu.edu/grad/>).

In certain cases, graduate students may be required to attend an intensive English program at the NYU School of Continuing and Professional Studies American Language Institute (ALI) upon enrollment. Credits obtained in ALI courses will not be included in the computation of the GPA or toward graduate degree completion. Students must attend ALI courses while taking a reduced graduate academic load of six credits per semester until reaching required English language proficiency, and failure to successfully complete required ESL courses will lead to academic dismissal.

Graduate Admission Status

Within the full-time and part-time classifications of graduate admission are three status groups: regular, conditional and special.

Regular Status

An admitted graduate applicant who is adequately prepared to begin graduate studies is assigned regular admission status with no conditions to meet upon the recommendation of the major department's faculty.

Conditional Status

Conditional status is assigned to a graduate applicant who is required to demonstrate additional ability to pursue the program for which he or she applied. Conditions may include taking introductory level or undergraduate courses, providing proof of degree completion, or attaining a specified grade-point average. Conditional admission requirements take precedence over other university policies regarding academic status. Students who do not satisfy the conditions of their admission will be academically disqualified.

Visiting Student (Non-Matriculated) Status

Students may be enrolled as either visiting or non-degree students at the discretion of the department and with the approval of the Office of Graduate Academics. Such status allows visiting students to take courses with the intent of transferring their credits back to their home institution and for non-degree-seeking students to take courses for professional or personal development.

To qualify for visiting student status, applicants must provide a transcript indicating their enrollment in a graduate program at another accredited institution. Applicants must show that

they are in good standing with the home institution. To qualify for non-degree status, applicants must show proof of a bachelor's degree (or its equivalent) with a cumulative grade point average of at least 3.0.

A maximum of 6 credits may be taken in one semester and no more than 9 credits may be taken, overall, as a visiting or non-degree student. If a student is subsequently admitted to a degree program at the NYU Tandon School of Engineering, the courses taken while registered as a visiting or non-degree student are considered to have been taken in residence. Permission to take courses as a visiting or non-degree seeking student does not guarantee subsequent admission to a degree or certificate program. Students who have been denied admission to the NYU Tandon School of Engineering may not take (or continue to take) courses as a non-degree or visiting student.

For visiting and non-degree applications, GRE scores are not required and unofficial or official transcripts may be provided by the applicant. For students enrolled in a program at another institution, a letter from the student's adviser or department chair is sufficient to establish that they are in good standing. A copy of the transcript(s) must be appended to the visiting student registration form.

Readmission

Students who previously attended the NYU Tandon School of Engineering, who have not attended for one or more semesters, and who did not receive an approved leave of absence must apply for readmission after consultation with the Office of Graduate Academics.

Financial Aid

Undergraduate Financial Aid

NYU Tandon School of Engineering administers a broad range of scholarship and financial aid programs to assist students in pursuing their educational goals. To meet the total cost of education, students may draw upon such available sources as student income, family income, School grants and federal and state funding.

All financial aid is limited to the need of the student as determined by the federal government's need analysis calculation. Students receiving financial assistance from outside sources, including scholarships, loans and other forms of educational assistance, must notify the Office of Financial Aid.

The following are three basic types of financial aid:

Scholarships and grants: funds awarded to students based on academic ability and financial need that do not require repayment.

Loans: specific sums awarded to students with repayment conditions. Education loans generally have low-interest rates with extended repayment terms.

Employment: part-time and summer jobs either on- or off-campus.

Approximately 90% of NYU Tandon School of Engineering's undergraduate students receive aid, including scholarships, grants, work-study jobs and student loans.

Applying for Financial Aid

Incoming first year students should file the CSS Profile (and Noncustodial Profile if applicable) by the deadlines which are dependent on whether you are an Early Decision or Regular Decision applicant. In addition to the CSS Profile, U.S. citizens and permanent residents are also required to file the Free Application for Federal Student Aid (FAFSA) by February 15 to secure both NYU scholarship and federal financial aid. Applications received later will be considered on a rolling basis if funds are available.

NY State Undocumented Students will also need to file an Undocumented Student Financial Aid Application in addition to the CSS Profile (and Noncustodial Profile if applicable). The deadlines for the Undocumented Student Financial Aid Application are the same as the deadlines for the CSS Profile. For more information on applying for financial aid as an Undocumented Student, please review the information on the Office of Financial Aid website.

Transfer students who are U.S. citizens or permanent residents should file a FAFSA by April 1. International transfer students are ineligible for financial aid.

Before completing the FAFSA, students should be sure to have a valid PIN number. This will serve as an electronic signature. To apply for a PIN number, please visit www.pin.ed.gov.

Parents of dependent students are required to sign the FAFSA so they should also apply for a federal PIN number at www.pin.ed.gov. Dependent students who complete the FAFSA without a parent signature will be rejected by the processor.

For comprehensive information on the application process, please see How to Apply on the Office of Financial Aid website.

Renewing Financial Aid

All currently enrolled students must reapply for financial aid annually by completing the Free Application for Federal Student Aid (FAFSA) by May 1st. U.S. citizens and permanent residents should file the Free Application for Federal Student Aid (FAFSA) and International Students should file the CSS Profile (the Noncustodial Profile is only required for the first year, not as a returning student). U.S. citizens and permanent residents do not need to file the CSS Profile. The FAFSA is available as of January 1st each year.

Students filing after May 1st will be considered late and may not qualify for all types of aid, such as NYU scholarship.

Students should make sure that all required sections of the FAFSA are completed before submitting:

- Signed by student (and parent for dependent students);
- Enter the code for New York University - 002796;
- Include housing status - on campus, commuting or off campus.

Include state residency information. New York residents should utilize NYS TAP to apply for NY State aid; the College Code for TAP is 0555.

Federal Campus-Based Programs

Students eligible for a federal campus-based program must (1) show need, (2) be enrolled at least half time (the equivalent of at least six credits per semester) and (3) confirm they are either a U.S. citizen or an eligible non-citizen.

To apply for any of these programs, students must have been accepted to NYU Tandon School of Engineering and have filed a FAFSA. The Office of Financial Aid determines the awards based upon the student's Estimated Family Contribution as determined by their FAFSA.

To continue to receive an award, students must make satisfactory academic progress, provide the Office of Financial Aid with all requested documents and report any changes in their financial situation annually.

All campus-based programs are contingent on annual awarding by the federal government. Renewal of awards may be affected.

Federal Work-Study Program

The Federal Work-Study Program provides part-time jobs for undergraduate students to help meet college-related expenses. The Office of Financial Aid determines eligibility.

At NYU Tandon School of Engineering, the average federal work-study award is \$1,500 per academic year. Jobs are arranged on-campus, along with community service opportunities. Most assignments average 10 to 15 hours a week, and the work schedule is adjusted to the student's and the employer's needs. The hourly rate varies depending on the position. Students are paid bi-weekly.

Federal and State Sponsored Programs

Federal Pell Grants

The Federal Pell Grant is a need-based program. Students apply for the Federal Pell Grant by completing a FAFSA. Awards are determined by the U.S. Department of Education according to an eligibility index and by the level of appropriations available. Grants are for study leading to a first bachelor's degree.

Eligible students must (1) be U.S. citizens or permanent residents, (2) make satisfactory academic progress and (3) meet federal need requirements.

Tuition Assistance Program (TAP)

Eligible students must (1) be New York State residents and U.S. citizens or permanent residents, (2) enroll full-time at an approved New York State post-secondary institution, (3) meet income requirements established by New York State, (4) complete a TAP application by May 1st for the current academic year and (5) not be in default on a federal or state student loan.

To apply for a TAP award, students should complete a TAP Application. NYU's TAP College Code is 0555.

To continue to receive TAP benefits, students must demonstrate satisfactory academic progress. All TAP recipients must achieve a minimum cumulative GPA of 2.0 after the completion of four full-time TAP payments.

In addition, students must fulfill the following academic requirements:

Complete a minimum number of credits by the end of each term of full-time study;
Maintain a minimum cumulative grade-point-average. The table below provides the correspondence between TAP payment points and academic progress.

Academic Progress for TAP Purposes

TAP Payment	Min. Credits Completed in Prior Semester	Minimum Cumulative GPA
1	0	0.00
2	6	1.50
3	15	1.80
4	27	1.80

5	39	2.00
6	51	2.00
7	66	2.00
8	81	2.00

TAP Waiver: Students who do not meet the criteria as indicated on Requirements 1 and 2 may be eligible for a one-time TAP Waiver. For appeal and consideration by the TAP Waiver Committee, students must file a TAP Waiver Form with the TAP certifying Officer in the Student Financial Services Office.

Vietnam Veterans Tuition Awards (VVTA) Supplement

In 1984, the New York State Legislature established the Vietnam Veterans Tuition Award program to provide tuition assistance for full-time or part-time undergraduate student for veterans who are residents of the state, who served in Indochina between February 28, 1961 and May 17, 1975, and who were discharged under honorable conditions or general discharge.

Since 1984, the program has been expanded to include veterans who served in the Persian Gulf on or after August 2, 1990 and in Afghanistan on or after September 11, 2001, and to provide awards for graduate as well as undergraduate study.

In 2008, the legislature further amended the law to also include “other eligible combat veterans.” This group includes individuals who are New York State residents, who served in the armed forces of the United States in hostilities that occurred after February 28, 1961, as evident by their receipt of an Armed Forces Expeditionary Medal, Navy Expeditionary Medal, or Marine Corps Expeditionary Medal and who were discharged under honorable conditions, as noted above.

For full-time study, veterans are eligible for an award equal to the amount of undergraduate tuition for New York State residents charged by the State University of New York, or actual tuition charged, whichever is less.

For part-time study, awards are prorated by credit hour. Part-time study for Veterans Tuition Awards is defined as at least three, but fewer than 12, semester hours at degree-granting institutions.

Higher Education Opportunity Program (HEOP)

HEOP is sponsored by New York State and NYU Tandon School of Engineering for entering freshmen who meet special academic and economic criteria. All inquiries are administered directly through the Office of HEOP. Consult the “Admissions” section and “Special Programs” for more information.

Awards are available for up to four years of undergraduate study, or five years for enrollment in the HEOP Program and up to three years of graduate study.

School Scholarships and Grants

The NYU Tandon School of Engineering awards scholarships to first year students with strong academic backgrounds for full-time study (12 credit hours a semester). Scholarships are offered through the Promise Fund, which administers more than 100 different programs. Students apply to the Office of Undergraduate Admissions through their application for admission. Awards may cover up to full tuition. Scholars must maintain a 2.5 cumulative GPA.

NYU Tandon School of Engineering awards the following scholarships:

Promise Scholarships

These merit scholarships are awarded in varying amounts, based on scholastic achievement. No award may be greater than the amount of tuition less any other aid for which students may be eligible. Scholars must maintain a 2.5 cumulative GPA. No separate application is required to receive or renew the Promise Scholarship. However, all incoming new students must complete a CSS Profile to be considered for institutional merit based scholarships.

NYU Tandon School of Engineering Grants

The need-based grants are awarded to students who demonstrate high financial need. Students apply directly to the NYU School of Engineering's Office of Financial Aid by completing a Free Application for Federal Student Aid (FAFSA) and must also complete the CSS Profile by the deadlines.

Promise Fund

Corporate and Individually Sponsored Scholarships

NYU Tandon School of Engineering scholarships are established through generous sponsors. Students are notified if their particular scholarship is corporate or individually donated.

Other Opportunities

Veterans Administration (VA) Educational Benefits

Eligible Veterans should apply for benefits through the Office of the Registrar. A summary of Veterans' benefits is available in the Office of the Registrar.

Students requesting VA benefits should notify the Office of the Registrar each semester after completing registration. Students must report interrupted attendance or termination of study. Details of NYU Tandon School of Engineering's requirements are given to all applicants. Please direct questions about veterans' benefits or paperwork to the Office of the Registrar either in person or by telephone.

Grant Aid to Non-New York State Residents

Some state-aid programs frequently require that awarded funds be used within the state, while other programs sometimes allow funds to be used out of state. Residents of Pennsylvania, Rhode Island, Vermont or Washington, D.C., should contact the following agencies for more financial aid information:

Pennsylvania Higher Education
Assistance Agency
Education Building
Harrisburg, PA 17126

Office of Scholarships
Rhode Island Department of Education
199 Promenade Street
Providence, RI 02908

Vermont Student Assistance Corporation
156 College Street
Burlington, VT 05401

Washington, D.C. Grant Program
Educational Assistance Office
1329 E. Street NW
Room 1050
Washington, DC 20004

Loan Programs

William D. Ford Federal Direct Subsidized Loan

The Federal Direct Loan program allows students to borrow money to help meet the costs of college. Students borrow this money and on to go into repayment as long as they meet the program's academic requirements or until six months after they graduate or withdraw from school.

Eligible students must be (1) U.S citizen or permanent resident, (2) enroll for at least six credits per semester and matriculate, (3) make satisfactory academic progress, (4) demonstrate

financial need as determined by the Free Application for Federal Aid (FAFSA).

Academic year loan limits are \$3,500 for freshmen, \$4,500 for sophomores and \$5,500 for juniors and seniors. Interest is subsidized by the government and does not accrue as long as the student meets programs requirements.

To apply, students must complete the FAFSA each year. First time Direct Loan borrowers must also complete the Master Promissory Note and Entrance Counseling session (online).

When student borrowers graduate, withdraw from school or enroll less than half-time, they will be required to complete the Exit Counseling session (online). Borrowers must begin repaying the loan six months after graduating or withdrawing from school. Direct Lending offers many different repayment options. Deferments and forgiveness options are also available. Borrowers should contact Direct Lending regarding any repayment, deferment or forgiveness options.

Repayment of part or of the entire loan may be made in advance at any time without penalty.

William D. Ford Federal Direct Unsubsidized Loan

The Federal Direct Unsubsidized loan is open to students who do not qualify for a subsidized loan (listed above). The same terms, conditions, annual borrowing limits apply. The only exception is that the borrower is responsible for interest that accrues while enrolled in school and during the six month grace period. Unpaid interest will be capitalized upon repayment after grace period.

In addition, independent students and dependent students whose parents are unable to secure a PLUS loan, may apply for an additional \$4,000 annually at the freshmen and sophomore levels or \$5,000 annually at the junior and senior level.

Federal Direct Parent Loan (PLUS)

PLUS loans are federal loans that parents of dependent undergraduate students can use to help pay for college expenses. Parents may borrow up to the full cost of attendance for each financially dependent student. A Free Application for Federal Student Aid (FAFSA) is required. Standard repayment begins within 60 days of receiving the final disbursement for the loan period. Deferment options are available so that repayment can be postponed until student graduates, withdraws or drops below half-time enrollment. Interest will accrue while in deferment. Parents must contact Direct Lending if they wish to defer.

Important Financial Aid Policies

- To be eligible for financial aid, students must enroll at least half-time per semester. However, students must register full time to receive TAP grants and NYU Tandon School of Engineering scholarships and grants.

- Financial aid applicants (including Federal Direct Loan applicants) must apply for a Pell Grant and, in the case of New York residents, for TAP. NYU Tandon School of Engineering scholarships and grants, combined with TAP, may not exceed tuition.
- Prospective students should not wait until their admission to apply for financial aid. These are concurrent processes. Applicants should apply for admission and financial aid (by filing all applications by the preferred application dates. Once students are admitted, they are reviewed for both merit and need-based financial aid. Most NYU scholarships are based on a combination of need and merit and require that the financial aid applications be submitted by our deadlines. Scholarships based purely on merit are limited and do not require a financial aid application as all students are reviewed for merit only scholarship upon admission.
- Financial aid is renewable annually based on the student's reapplication in filing the FAFSA or CSS Profile (depending on whether you are a U.S. citizen/permanent resident or an international student), determination of continued demonstration of financial need where applicable, and fulfillment of other requirements as stipulated by their awards.
- Standards of achievement for scholarship maintenance are reviewed each year at the end of the spring semester. More information is available below.
- Since certain financial aid and scholarship funds administered by the NYU Tandon School of Engineering are limited, students should enroll after receipt of confirmed financial support. Funds not administered by the School, such as Pell Grants, TAP and the Direct Loans, are available to eligible students.
- Title IV Financial Aid (Pell Grants, College Work Study, Perkins Loan and Stafford Loans) are contingent upon receipt of the following documents:
 1. A valid FAFSA application;
 2. Properly signed Financial Aid Acceptance letter;
 3. Copy of student's and/or parent's IRS tax forms, if requested;
 4. Proof of citizenship or permanent residency status, if requested;
 5. Selective Service Registration for males - born after 1960;
 6. Other documents as required for verification of information stated on the students FAFSA.

Satisfactory Academic Progress

Students must meet the satisfactory academic progress (SAP) requirements to qualify for all federal, state, and institutional awards. Satisfactory academic progress has a two-fold criteria. Students must achieve a specific cumulative grade point average (GPA) AND must pass a percentage of their total credits attempted. Satisfactory academic progress requirements are listed online at <https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/eligibility-for-financial-aid.html#progress>.

SAP is reviewed at the end of each spring term. Based on federal regulation, students who do not meet the SAP standard and enroll in a term are considered to be using their probationary semester, regardless of whether they pursue financial aid. (Example: If after the spring term you are not meeting the SAP standard and you are enrolled in the summer term, the summer term

would be considered your probationary semester regardless of whether you pursue financial aid.)

Approval will be reviewed based on the following criteria:

- the student is able to mathematically meet Satisfactory Academic Progress after one semester of enrollment
- the student has never had a probationary semester before during the current degree
- the student has never been denied financial aid for a previous semester due to an Academic Progress issue

Students who are approved will be placed on financial aid probation for one semester. The student will remain eligible for financial aid and will continue to receive financial assistance during the approved probationary semester.

Students who meet the SAP standard at the end of their probationary semester will be restored to Satisfactory Academic Progress status. Students who do not meet the SAP requirements at the end of the probationary period will be placed on financial aid suspension (described above).

Students are permitted only one semester of financial aid probation. If a student meets the SAP requirement at the end of their probationary semester but later fails again to meet the SAP requirement, the student is not eligible for additional financial aid probation, except in the event of illness or injury.

Students requesting additional aid consideration on the basis of documented special circumstances, such as illness or injury, must submit the appeal form no later than the last day of the semester's add/drop period to ensure proper time is available for review. In such cases, if approved, an individualized academic contract is created for their probation term.

Impact of Withdrawal on Financial Aid

Students who receive Title IV federal aid and withdraw from all courses prior to completing 60% of the academic term will have their federal financial aid pro-rated according to the Federal Return to Title IV (R2T4) calculation.

In accordance with federal regulations, students who totally withdraw from the NYU School of Engineering and received Federal Title IV financial assistance (Direct Loans, Pell, or Perkins Loans) will be subject to the Federal Refund Policy on the possible return of funds awarded.

The amount of the semester's unearned Federal Aid must be returned to its source. The amounts to be returned are based on the federal R2T4 calculation. When returning Title IV funds, the federally mandated priority listing will be used:

1. Federal Direct Unsubsidized Loan
2. Federal Direct Subsidized Loan

3. Perkins Loan
4. Federal Direct Parent Loan
5. Pell Grant

If a student has an account balance resulting from these adjustments, the student is responsible for payment.

Students who withdraw whose tuition charges are reduced or cancelled may no longer be eligible for NYU scholarship. A review of scholarship eligibility will determine the portion of scholarship that the student may keep to cover billed charges.

Graduate Financial Aid

Graduate Scholarships

Graduate scholarships are available for master's students on a competitive basis. They are awarded at the time of admission and are primarily based on academic performance. All graduate scholarship recipients are required to maintain the academic terms listed in their award letter in order to continue scholarship awards past their first enrolled semester.

Students who are admitted to multiple graduate programs are eligible for only one offered scholarship; it is the policy of the Polytechnic School of Engineering to not "stack" scholarship awards.

Research Fellowships

Doctoral students receiving research fellowships are assigned to research that fulfills the thesis requirement of the graduate curriculum in which they matriculate. They receive a living allowance and remitted tuition. Fellows must be registered as full-time students taking each semester nine or more credits, possibly including their thesis. Typically, funding comes from grants and contracts that faculty have secured from government agencies or industry. In these cases, the student's research is also reported to the funding agency or company as part of the grant or contract requirements.

William D. Ford Federal Direct Unsubsidized Loan

The Federal Direct Unsubsidized loan is available to graduate students in the amount of \$20,500 per academic year. Eligible students must (1) be U.S. Citizens or permanent residents, (2) matriculate and enroll in at least 4.5 credits per semester, (3) make satisfactory academic progress and (4) demonstrate financial need as determined by the Free Application for Federal Student Aid (FAFSA).

To apply, students must complete a FAFSA each year. First time Direct Loan borrowers must also complete the Master Promissory Note and Entrance Counseling session (online).

Student borrowers who withdraw from the school or enroll less than half-time will be required to complete the Exit Counseling session (online). Borrowers must begin repaying the loan six months after graduating or withdrawing from school. Direct Lending offers many different repayment options, and deferments and forgiveness options are also available. Borrowers should contact Direct Lending regarding any of these options.

Graduate Federal Direct Plus Loan

PLUS loans are federal loans that Graduate students may use to help pay for college expenses. Graduate students whose full cost of attendance is not covered by the William D. Ford Unsubsidized Direct Loan may apply for the Graduate Direct PLUS loan. Students may apply for up to the full cost of attendance minus any financial aid. A FAFSA is required and the Unsubsidized Direct Loan must be accepted before applying for the PLUS loan. The loan is not guaranteed and is subject to credit approval. Repayment can be deferred until graduation or withdrawal from the University. Contact the NYU Office of Financial Aid or the Federal Student Aid website regarding interest rates and application process.

Bills, Payments and Refunds

The Office of the Bursar is the central billing and collection point for New York University. The department is responsible for managing the university billing, collecting, refunding and cashing functions.

<http://www.nyu.edu/life/resources-and-services/nyu-studentlink/bills-payments-and-refunds/students.html>

NYU CALENDARS

Academic Calendar 2016-2018

Fall 2016

Friday, March 11, 2016	Fall 2016 course search and registration status features available on Albert. Please review the withdrawal schedule to determine when a grade of 'W' will be issued when dropping classes.
Monday, April 11, 2016	Registration Begins by appointment for Undergraduate, Graduate and Diploma students.
Monday, May 30, 2016	Memorial Day No classes scheduled / University Holiday
Monday, July 4, 2016	Independence Day No classes scheduled / University Holiday
Tuesday, August 9, 2016	Undergraduate Fall Payment Due Failure to meet the payment deadline may result in the cancellation of class reservations
Sunday, August 28, 2016	NYU Welcome Day / Move-in Day
Monday, September 5, 2016	Labor Day No classes scheduled / University Holiday
Tuesday, September 6, 2016	Fall 2016 classes begin
Thursday, September 15, 2016	Initial registration on or after September 15th will be charged a late registration fee. Fee for undergraduate and diploma students: \$50.00 Fee for graduate students: \$25.00
Monday, September 19, 2016	Last day of active waitlists
Monday, September 19, 2016	Last day of initial registration on Albert for all students.
Monday, September 19, 2016	Last day to drop/add on Albert for all students.
Monday, September 19, 2016	Last day to drop a class and receive a refund of 100% of tuition & fees for Undergraduate, Graduate and Diploma students who are dropping classes, but will remain enrolled in at least one course. For Undergraduate, Graduate and Diploma students who 'Completely Withdraw' from ALL courses during the semester, please see the Refund Schedule for Complete Withdrawal.
Monday, September 19, 2016	Last day to drop fall 2016 classes and not receive a grade of "W"
Tuesday, September 20, 2016	Fall Payment is due for Graduate students

	Failure to meet the payment deadline may result in the cancellation of class reservations
Tuesday, September 20, 2016	Waitlists will be purged
Tuesday, September 20, 2016	All students who wish to perform initial registration or a registration transaction to add a class must go to their academic advisor or their academic department in order to initiate this request.
	Beginning today students who want to withdraw from a class should use the Request Class Withdrawal process.
Tuesday, September 20, 2016	Courses dropped after the first two weeks of the semester: No refund of tuition or fees for Undergraduate, Graduate and Diploma students who are dropping classes, but will remain enrolled in at least one course.
Tuesday, September 20, 2016	Beginning today students will be issued a grade of 'W' if they drop a class from their fall schedule or withdraw for the term
Tuesday, October 4, 2016	Initial registration on or after October 4th will be charged a late registration fee. Fee for undergraduate and diploma students: \$100.00 Fee for graduate students: \$50.00
Monday, October 10, 2016	Fall Recess No classes scheduled
Monday, November 7, 2016	Last day to use the Term Withdrawal Form to submit a fall semester term withdrawal request or submit a request to withdraw from a course. Students should consult the academic calendar of their home school for specific deadlines pertaining to course withdrawal for the term.
Monday, November 7, 2016	Midterm Grades Deadline.
Wednesday, November 23, 2016 - Sunday, November 27, 2016	Student Thanksgiving Recess No classes scheduled
Thursday, November 24, 2016 - Sunday, November 27, 2016	Thanksgiving Recess for University Offices No classes scheduled / University Holiday
Tuesday, December 13, 2016	Legislative Day - Classes will meet according to a Monday schedule
Friday, December 16, 2016	Last day of Fall 2016 classes
Saturday, December 17, 2016 - Sunday, December 18, 2016	Reading Days
Monday, December 19, 2016 - Friday, December 23, 2016	Fall Semester Exams
	College of Arts & Science College of Nursing - Undergraduate (Non-Nursing Clinical Sequence) & Graduate Faculty of Arts & Science/Liberal Studies Gallatin School for Individualized Study Graduate School of Arts & Science Leonard N. Stern School of Business - Undergraduate College

Tandon School of Engineering
Robert F. Wagner - Graduate School of Public Service
School of Professional Studies - Credit Programs
Silver School of Social Work
Steinhardt School of Culture, Education, and Human
Development
Tisch School of the Arts
College of Global Public Health

Final Grades Deadline
Grades are due 72 hours after the scheduled final exam date

Saturday, December 24, 2016 -
Monday, January 2, 2017

Student Winter Recess
No classes scheduled

Saturday, December 24, 2016 -
Monday, January 2, 2017

Winter Recess for University Offices
The University, including the Office of the University Registrar,
will be closed from Saturday, December 24, 2016 through
Sunday, January 1, 2017.
During this period requests for paper transcripts and enrollment
certifications will not be processed.

Tuesday, January 3, 2017

The University reopens

January Term 2017

Friday, September 30, 2016

January Term 2017 course search and registration status features
available on Albert.

Please review the withdrawal schedule to determine when a grade of 'W'
will be issued when dropping classes

Monday, October 17, 2016

January 2017 registration begins at 9:00 a.m. Eastern Standard Time for
most Undergraduate, Graduate and Diploma students.

Wednesday, November 23, 2016 -
Sunday, November 27, 2016

Student Thanksgiving Recess
No classes scheduled / University Holiday

Thursday, November 24, 2016 -
Sunday, November 27, 2016

Thanksgiving Recess for University Offices
No classes scheduled / University Holiday

Tuesday, December 6, 2016

The January term tuition payment is due

Failure to meet the payment deadline may result in the cancellation of
class reservations

Saturday, December 24, 2016 -
Monday, January 2, 2017

Student Winter Recess
No classes scheduled / University Holiday

Winter Recess for University Offices

The University, including the Office of the University Registrar, will be
closed from Saturday, December 24, 2016 through Monday, January 2,
2017

	During this period requests for paper transcripts and enrollment certifications will not be processed
Tuesday, January 3, 2017	The University reopens
	January Term 2017 classes begin
	Last day of active waitlists
	Last day for all students to use Albert to add or drop January term classes
	Last day to drop a class and receive a refund of 100% of tuition
Wednesday, January 4, 2017	Waitlists will be purged
	Beginning today students who want to withdraw from a class should use the Request Class Withdrawal process.
	All students who wish to perform initial registration or a registration transaction to add a class must go to their academic advisor or their academic department in order to initiate this request.
Thursday, January 5, 2017	The last day to drop a class without the issuance of a 'W' grade
Friday, January 6, 2017	A grade of 'W' will be issued for students who drop a class or withdraw for the term
Monday, January 16, 2017	Martin Luther King, Jr. Day No classes scheduled / University Holiday
Friday, January 20, 2017	Last day of January Term 2017 classes

Spring 2017

Friday, October 14, 2016	Spring 2017 course search and registration status features available on Albert.
	Please review the withdrawal schedule to determine when a grade of 'W' will be issued when dropping classes
Monday, November 14, 2016	Registration Begins at 9:00 a.m. Eastern Standard Time for most Undergraduate, Graduate and Diploma students.
Wednesday, November 23, 2016 - Sunday, November 27, 2016	Student Thanksgiving Recess No classes scheduled
Thursday, November 24, 2016 - Sunday, November 27, 2016	Thanksgiving Recess for University Offices No classes scheduled
Saturday, December 24, 2016 - Monday, January 2, 2017	Student Winter Recess No classes scheduled

Winter Recess for University Offices

The University, including the Office of the University Registrar, will be closed from Saturday, December 24, 2016 through Monday, January 2, 2017.

During this period requests for paper transcripts and enrollment certifications will not be processed

Tuesday, January 3, 2017

The University reopens

Wednesday, January 4, 2017

Undergraduate Spring Payment Due

Failure to meet the payment deadline may result in the cancellation of class reservations

Monday, January 16, 2017

Martin Luther King, Jr. Birthday
No classes scheduled / University Holiday

Friday, January 20, 2017

Last day of January Term 2017 classes

Monday, January 23, 2017

Spring 2017 classes begin

Wednesday, February 1, 2017

Late registration begins

Initial registration between February 1, 2017 and February 19, 2017 will be charged a late registration fee

Fee for undergraduate and diploma students: \$50.00

Fee for graduate students: \$25.00

Sunday, February 5, 2017

Last day of active waitlists

Last day of initial registration on Albert for all students

Last day to drop/add on Albert for all students.

Last day to drop a class and receive a refund of 100% of tuition & fees for Undergraduate, Graduate and Diploma students who are dropping classes, but will remain enrolled in at least one course. For Undergraduate, Graduate and Diploma students who 'Completely Withdraw' from ALL courses during the semester, please see the Refund Schedule for Complete Withdrawal.

Last day to drop spring 2017 classes and **not** receive a grade of 'W'.

Monday, February 6, 2017

Beginning today students will be issued a grade of 'W' if they drop a class from their spring schedule or withdraw for the term.

Waitlists will be purged

Courses dropped after the first two weeks of the semester: No refund of tuition or fees for Undergraduate, Graduate and Diploma students who are dropping classes, but will remain enrolled in at least one course.

Beginning today students who want to withdraw from a class should use the Request Class Withdrawal process.

All students who wish to perform initial registration or a registration transaction to add a class must go to their academic advisor or their academic department in order to initiate this request.

Tuesday, February 7, 2017

Graduate Spring Payment Due

Failure to meet the payment deadline may result in the cancellation of class reservations

Monday, February 20, 2017

Presidents' Day
No classes scheduled / University Holiday

Initial registration on or after Monday, February 20th will be charged a **revised** late registration fee

Fee for undergraduate and diploma students: \$100.00
Fee for graduate students: \$50.00

Monday, March 6, 2017

Midterm grade entry period opens

Monday, March 13, 2017 -
Sunday, March 19, 2017

Spring Recess
No classes scheduled

Friday, March 31, 2017

Last day to use the Term Withdrawal Form to submit a spring semester term withdrawal request or submit a request to withdraw from a course. Students should consult the academic calendar of their home school for specific deadlines pertaining to course withdrawal for the term.

Faculty deadline for entering midterm grades

Monday, May 8, 2017

Last day of Spring 2017 classes

Tuesday, May 9, 2017

Reading Day

Wednesday, May 10, 2017 -
Tuesday, May 16, 2017

Spring Semester Exams

College of Arts & Science
College of Nursing - Undergraduate (Non-Nursing Clinical Sequence) & Graduate
Faculty of Arts & Science/Liberal Studies
Gallatin School for Individualized Study Graduate School of Arts & Science
Leonard N. Stern School of Business - Undergraduate College
Tandon School of Engineering
Robert F. Wagner - Graduate School of Public Service
School of Professional Studies - Credit Programs
Silver School of Social Work
Steinhardt School of Culture, Education, and Human Development
Tisch School of the Arts University College/Global Public Health

Final Grades Deadline

Grades are due 72 hours after the scheduled final exam date

Wednesday, May 17, 2017

Commencement (tentative date)

Summer 2017

Friday, January 13, 2017

Summer 2017 course search and registration status features on Albert.

Monday, February 13, 2017

Registration begins at 9:00 a.m. Eastern Standard Time for most Undergraduate, Graduate, and Diploma students.

Thursday, May 11, 2017

The summer term tuition payment is due.

Failure to meet the payment deadline may result in the cancellation of class reservations.

Wednesday, May 17, 2017

Commencement (tentative)

Sunday, May 21, 2017

Last day to drop a class scheduled in the Special Session and receive a refund of 100% Tuition and Fees.

Sunday, May 21, 2017

Last day to enroll on albert for those classes scheduled during the Special Session.

Sunday, May 21, 2017

Last day of active waitlists for classes scheduled during the Special Session.

Monday, May 22, 2017

First day of Summer term classes: 12-Week Session, 7-Week Session, First 6-Week Session, First 3-Week Session and the Special Session.

Tuesday, May 23, 2017

Last day to enroll on Albert for those classes scheduled during the First 3-Week Session.

Tuesday, May 23, 2017

Last day to drop a class scheduled in the First 3-Week Session and receive a refund of 100% Tuition and Fees.

Tuesday, May 23, 2017

Last day to drop a class scheduled in the First 3-Week Session and not be issued a grade of 'W'.

Tuesday, May 23, 2017

Last day of active waitlists for classes scheduled during the First 3-Week Session.

Wednesday, May 24, 2017

Beginning today, withdrawal from a class scheduled in the First 3-Week Session will result in the issuance of a 'W' grade.

Wednesday, May 24, 2017

Last day of active waitlists for a class scheduled during the 12-Week Session, the 7-Week Session, or the First 6-Week Session.

Thursday, May 25, 2017

Last day to enroll on Albert for classes scheduled during the 12-Week Session, the 7-Week Session, or the First 6-Week Session.

Thursday, May 25, 2017

Last day to drop a class during the 12-Week Session, the 7-Week Session, or the First 6-Week Session and receive a refund of 100% Tuition and Fees.

Thursday, May 25, 2017	Last day to drop a class scheduled during the 12-Week Session, the 7-Week Session, or the First 6-Week Session and not be issued a grade of 'W'.
Friday, May 26, 2017	Beginning today, withdrawal from a class scheduled during the 12-Week Session, the 7-Week Session, or the First 6-Week Session will result in the issuance of a 'W' grade.
Monday, May 29, 2017	Memorial Day No classes scheduled / University Holiday
Sunday, June 11, 2017	Last day of classes: First 3-Week Session
Monday, June 12, 2017	First day of classes: Second 3-Week Session
Tuesday, June 13, 2017	Last day of active waitlists for classes scheduled during the second 3-week session.
Tuesday, June 13, 2017	Last day to enroll into classes scheduled during the second 3-week session on Albert
Tuesday, June 13, 2017	Last day to drop a class scheduled in the Second 3-Week Session and receive a refund of 100% Tuition and Fees.
Tuesday, June 13, 2017	Last day to drop a class scheduled in the Second 3-Week Session and not be issued a grade of 'W'.
Wednesday, June 14, 2017	Beginning today, withdrawal from a class scheduled in the Second 3-Week Session will result in the issuance of a 'W' grade.
Saturday, June 17, 2017	Legislative Day for Monday classes, if requested by instructor.
Sunday, July 2, 2017	Last day of classes: First 6-Week Session and Second 3-Week Session.
Monday, July 3, 2017	First day of classes: Second 6-Week Session and Third 3-Week Session.
Tuesday, July 4, 2017	Independence Day No classes scheduled / University Holiday
	Last day of active waitlists for classes scheduled during the Third 3-Week Session.
	Last day to enroll on Albert for those classes scheduled during the Third 3-Week Session.
	Last day to drop a class scheduled in the Third 3-Week Session and receive a refund of 100% Tuition and Fees.
	Last day to drop a class scheduled in the Third 3-Week Session and not be issued a grade of 'W'.
Wednesday, July 5, 2017	Beginning today, withdrawal from a class scheduled during the Third 3-Week Session will result in the issuance of a 'W' grade.
Wednesday, July 5, 2017	Last day of active waitlists for classes scheduled during the Second 6-Week Session.
Thursday, July 6, 2017	Last day to drop a class scheduled in the Second 6-Week Session and not be issued a grade of 'W'.

	Last day to enroll on Albert for classes scheduled during the Second 6-Week Session.
	Last day to drop a class scheduled in the Second 6-Week Session and receive a refund of 100% Tuition and Fees.
Friday, July 7, 2017	Beginning today, withdrawal from a class scheduled in the Second 6-Week Session will result in the issuance of a 'W' grade.
Sunday, July 9, 2017	Last day of classes: 7-Week Session.
Sunday, July 23, 2017	Last day of classes: Third 3-Week Session
Monday, July 24, 2017	First day of classes: Fourth 3-Week Session
Tuesday, July 25, 2017	Last day of active waitlists for classes scheduled during the Fourth 3-Week Session.
	Last day to enroll on Albert for those classes scheduled during the Fourth 3-Week Session
	Last day to drop a class scheduled in the Fourth 3-Week Session and receive a refund of 100% Tuition and Fees.
	Last day to drop a class scheduled in the Fourth 3-Week Session and not be issued a grade of 'W'.
	Beginning today, withdrawal from a class scheduled in the Fourth 3-Week Session will result in the issuance of a 'W' grade.
Saturday, July 29, 2017	Legislative Day for Tuesday classes, if requested by instructor.
Tuesday, August 8, 2017	Undergraduate Fall Payment Due
	Failure to meet the payment deadline may result in the cancellation of class reservations.
Sunday, August 13, 2017	Last day of classes: 12-Week Session, Second 6-Week Session, Fourth 3-Week Session and the Special Session.
	Final Grades Deadline Grades are due 72 hours after the scheduled final exam date

Fall 2017

Friday, March 24, 2017	Fall 2017 course search and registration status features available on Albert. Please review the withdrawal schedule to determine when a grade of 'W' will be issued when dropping classes.
Monday, April 24, 2017	Registration begins by appointment for Undergraduate, Graduate and Diploma students.

Monday, May 29, 2017	Memorial Day No classes scheduled / University Holiday
Tuesday, July 4, 2017	Independence Day No classes scheduled / University Holiday
Sunday, August 27, 2017	NYU Welcome Day / Move-in Day
Monday, September 4, 2017	Labor Day No classes scheduled / University Holiday
Tuesday, September 5, 2017	Fall 2017 classes begin
Monday, September 18, 2017	Last day of active waitlists Last day of initial registration on Albert for all students. Last day to drop/add on Albert for all students Last day to drop fall 2017 classes and not receive a grade of 'W'.
Tuesday, September 19, 2017	Waitlists will be purged. All students who wish to perform initial registration or a registration transaction to add a class must go to their academic advisor or their academic department in order to initiate this request. Beginning today students who want to withdraw from a class should use the Request Class Withdrawal process. Courses dropped after the first two weeks of the semester: No refund of tuition or fees for Undergraduate, Graduate and Diploma students who are dropping classes, but will remain enrolled in at least one course. Beginning today students will be issued a grade of 'W' if they drop a class from their fall schedule or withdraw for the term
Monday, October 9, 2017	Fall Recess No classes scheduled
Monday, November 6, 2017	Midterm Grades Deadline Last day to use the Term Withdrawal Form to submit a fall semester term withdrawal request or submit a request to withdraw from a course. Students should consult the academic calendar of their home school for specific deadlines pertaining to course withdrawal for the term.
Wednesday, November 22, 2017 - Sunday, November 26, 2017	Student Thanksgiving Recess No classes scheduled
Thursday, November 23, 2017 - Sunday, November 26, 2017	Thanksgiving Recess for University Offices No classes scheduled / University Holiday
Tuesday, December 12, 2017	Legislative Day - Classes will meet according to a Monday

	schedule
Friday, December 15, 2017	Last day of Fall 2017 classes
Saturday, December 16, 2017 - Sunday, December 17, 2017	Reading Days
Monday, December 18, 2017 - Friday, December 22, 2017	Fall Semester Exams College of Arts & Science College of Nursing - Undergraduate (Non-Nursing Clinical Sequence) & Graduate Faculty of Arts & Science/Liberal Studies Gallatin School for Individualized Study Graduate School of Arts & Science Leonard N. Stern School of Business - Undergraduate College Tandon School of Engineering Robert F. Wagner - Graduate School of Public Service School of Professional Studies - Credit Programs Silver School of Social Work Steinhardt School of Culture, Education, and Human Development Tisch School of the Arts University College/Global Public Health Final Grades Deadline Grades are due 72 hours after the scheduled final exam date
Saturday, December 23, 2017 - Monday, January 1, 2018	Student Winter Recess No classes scheduled Winter Recess for University Offices The University, including the Office of the University Registrar, will be closed from Saturday, December 22, 2017 through Monday, January 1, 2018. During this period requests for paper transcripts and enrollment certifications will not be processed.
Tuesday, January 2, 2018	The University reopens

January Term 2018

Tuesday, January 2, 2018	January Term 2018 classes begin
Monday, January 15, 2018	Martin Luther King, Jr. Day No classes scheduled / University Holiday
Friday, January 19, 2018	Last day of January Term 2018 classes

Spring 2018

Monday, January 22, 2018	Spring 2018 classes begin
Monday, February 19, 2018	Presidents' Day No classes scheduled / University Holiday
Monday, March 12, 2018 - Sunday, March 18, 2018	Spring Recess No classes scheduled
Monday, May 7, 2018	Last day of Spring 2018 classes
Tuesday, May 8, 2018	Reading Day
Wednesday, May 9, 2018 - Tuesday, May 15, 2018	Spring Semester Exams College of Arts & Science College of Nursing - Undergraduate (Non-Nursing Clinical Sequence) & Graduate Faculty of Arts & Science/Liberal Studies Gallatin School for Individualized Study Graduate School of Arts & Science Leonard N. Stern School of Business - Undergraduate College Tandon School of Engineering Robert F. Wagner - Graduate School of Public Service School of Professional Studies - Credit Programs Silver School of Social Work Steinhardt School of Culture, Education, and Human Development Tisch School of the Arts University College/Global Public Health Final Grades Deadline Grades are due 72 hours after the scheduled final exam date
Wednesday, May 16, 2018	Commencement (tentative date)

Summer 2018

Monday, May 21, 2018	First day of classes: Six Week Summer Session I / 1st Quarter - Three Week Session
Monday, May 28, 2018	Memorial Day No classes scheduled / University Holiday
Sunday, June 10, 2018	Last day of classes: 1st Quarter - Three Week Session
Monday, June 11, 2018	First day of classes: 2nd Quarter - Three Week Session
Saturday, June 16, 2018	Legislative Day for Monday classes, if requested by instructor
Sunday, July 1, 2018	Last day of classes: Six Week Summer Session I / 2nd Quarter - Three Week Session

Monday, July 2, 2018	First day of classes: Six Week Summer Session II / 3rd Quarter - Three Week Session
Wednesday, July 4, 2018	Independence Day No classes scheduled / University Holiday
Sunday, July 22, 2018	Last day of classes: 3rd Quarter - Three Week Session
Monday, July 23, 2018	First day of classes: 4th Quarter - Three Week Session
Saturday, July 28, 2018	Legislative Day for Monday classes, if requested by instructor
Sunday, August 12, 2018	Last day of classes: Six Week Summer Session II / 4th Quarter – Three Week Session
	Final Grades Deadline Grades are due 72 hours after the scheduled final exam date

UNDERGRADUATE ACADEMIC REQUIREMENTS AND POLICIES

Program Areas

The NYU Tandon School of Engineering addresses the world of technology and its unique interactions with society. To fulfill its mission, NYU Tandon School of Engineering offers degree programs in five general academic areas:

- Computer Science and Engineering
- Engineering
- Sciences and Mathematics
- Science and Technology Studies
- Technology Management

Computer Science and Engineering

Computer science and engineering is an important and expanding field as today's society advances further into the Information Age. Computer science and engineering includes designing systems (computer hardware and software) and developing principles for applying computers to new uses. The field requires high levels of theory and practice and often involves developing or integrating complex software.

Computer science and engineering is a major element in modern information technology, allowing information to be used to analyze and solve problems in diverse fields, including telemedicine, health care, finance, entertainment, manufacturing, telecommunications, transportation and biomedicine. Because of the breadth of its potential applications, computer science and engineering at NYU Tandon School of Engineering has a multidisciplinary focus.

The curriculum integrates basic science, computer science, mathematics, humanities and social sciences. Students take electives in technical and non-technical subjects, a mix that allows for flexibility and breadth in their studies at NYU Tandon.

The current faculty works in state-of-the-art fields such as high-speed imaging, classification, software virus protection, high-speed graphics, text and data mining, fault-tolerant computing, database-management systems, software engineering, data compression, data security, parallel and distributed computation, scheduling theory, computer vision and Internet and Web technologies. This faculty experience, combined with a strong curriculum that integrates theory and practice, positions NYU Tandon graduates well for the 21st century.

Engineering

Engineering is the creation of devices and implements that can control or manipulate nature to produce a desired effect, applying science to build the infrastructure and tools society needs to improve the quality of life and the environment.

The modern engineer must have a firm background in the sciences and mathematics. Science reveals fundamental knowledge about the natural world. Mathematics comprises the language and tool used most often by engineers to analyze and manipulate that world. Additionally, a background

in the liberal arts provides a fundamental understanding of society, its structures, needs and desires. No one can hope to improve society without such understanding. Engineers also must deeply appreciate the role they play in society, particularly in terms of their professional ethics and responsibilities. Finally, engineers must have excellent written and oral communication skills to work effectively with other engineers, professionals, decision-makers and the public.

NYU Tandon's engineering programs build on a firm foundation of mathematics and science to develop the analytic and conceptual skills required of a practicing professional. Laboratory classes introduce students to devices and systems currently used in their fields and help develop their skills in using computer-aided design packages. Undergraduate programs prepare students equally for entry into the profession and for continued education at the graduate level.

NYU Tandon, by giving students a comprehensive education in scientific and engineering principles and by developing creative skills required for engineering design and analysis, provides its graduates with the ability to continue to learn and grow in rapidly developing technological fields throughout their careers.

Current NYU Tandon faculty and alumni are advancing varied fields such as telecommunications, microwaves, imaging sciences, quantum electronics, pulsed power, smart materials, aerospace, robotics, geotechnology, biomedical engineering, financial and risk engineering, cyber security, gaming, software engineering and sensors and sensor networks. Through the School's engineering curriculum, students are equipped to advance this tradition forward to the next generation of technological breakthroughs.

The Sciences and Mathematics

Science and mathematics underpin modern technology. As scientists and mathematicians discover and describe secrets of the natural world, engineers look to apply them to developing new technology. Without the physical sciences and mathematics, engineers would have no tools with which to invent the technology of tomorrow.

NYU Tandon School of Engineering's undergraduate science and mathematics programs give students unique opportunities to study basic theory while interacting with design disciplines. The undergraduate program structure in these areas encourages students to select concentrations of elective courses in technology areas.

Students use modern laboratories and interact with faculty who are world-class researchers. Many upper-level classes are small, allowing students to develop one-on-one relationships with faculty and to work with them in their research areas.

The future of technology depends on the ability to develop a better and more accurate understanding of nature and its opportunities and constraints. For technology to advance, scientists must continue to unlock the secrets of the universe, and mathematicians must continue to develop the analytical and logical processes through which they can extend and apply what they investigate and discover. NYU Tandon programs prepare scientists and mathematicians for this vital role, enabling them to lead society to a better future.

Science and Technology Studies

Science and Technology Studies (STS) is an interdisciplinary field in which methods of analysis from a wide range of fields in the humanities and social sciences are used to study the relations among science, technology and society. Such methods include historical, philosophical, sociological, psychological, scientific, literary, journalistic and cultural and media-studies approaches. STS creates technology-savvy, ethical and socially responsible users, developers and critics of science and technology. It contributes a key element to developing well-rounded engineers and scientists. Such professionals are capable not only of technical expertise and its dissemination, but also of innovative and creative ways to reason and communicate with fellow citizens. STS graduates have the best of both worlds: broad training in the liberal arts coupled with expertise in science and technology. This combination makes them stand out and gives them an advantage over graduates of more narrowly focused programs.

Technology Management

NYU Tandon School of Engineering's Department of Technology Management is the leading learning, research and development hub in the New York City/tri-state region, devoted explicitly to the critical arenas of innovation, information and technology management.

The department has achieved this distinguished position with a continuous stream of high-quality and relevant research, development and pace-setting learning programs. Its faculty contributes to theory and practice in an increasingly knowledge-intensive age.

The research and development conducted within the Department of Technology Management is varied, including scholarly books and articles in respected journals and timely case studies. Some of this material forms part of the content in educational programs, helping to keep programs up-to-date and distinctive. The department is also committed to integrating technology into all educational programs to enhance learning. Because all managers must understand how technology and innovation are essential for delivering value to organizations and to the market, the department offers a portfolio of educational programs dealing with the broad spectrum of innovation, information and technology management in the modern economy.

In addition to its academic programs at the undergraduate, graduate and doctoral levels, the Department of Technology Management offers short-term non-degree courses and workshops, including those tailored to the needs of specific firms and industries on contemporary topics in technology management.

Undergraduate Degree Requirements

This section details general institutional degree requirements applicable to all NYU Tandon School of Engineering undergraduate degrees. Academic departments may place additional requirements on individual degrees. Such additional requirements are explained in the program sections of this catalog. In no case may a department specify requirements less stringent than those indicated here.

Outcomes Assessment

NYU Tandon School of Engineering conducts outcomes assessments to monitor students' academic achievement, effective teaching methods, institutional improvements, and to ensure compliance with

accreditation standards. To obtain periodic measurements of student perceptions and intellectual growth, undergraduate students are asked to participate in surveys, focus groups, interviews or related activities. While individual input is collected, the data from these assessments are published in aggregate form. Undergraduate students must complete online course surveys for all courses in which they are registered each semester (except guided studies and courses in which the enrollment is fewer than six students). Graduating seniors must complete exit surveys online. Any additions to or exceptions to this requirement are disseminated to the campus community each semester by the Office of Assessment and Institutional Research. Compliance with outcomes-assessment activities is traditionally a precondition for receipt of semester grade reports, transcripts, and degrees.

Basic Degree Requirements and Definition of Credits

Programs for the degree Bachelor of Science require 120 to 142 credits, depending upon the major as described in the program's section of this bulletin. Undergraduate semester credits are based on the number of 50-minute periods scheduled each week during one semester. Traditionally, one credit signifies a minimum of one 50-minute period of class work, or three 50-minute periods of undergraduate laboratory, over a period of 14 weeks, in addition to a final exam period. On occasion, more time per credit is given. The final examination period is an integral part of the semester.

Students may attend the University part-time or full-time. All undergraduate degrees can be completed in four years of full-time study. To earn the degree Bachelor of Science from NYU Tandon School of Engineering, students must satisfy University residency requirements. The majority of undergraduate courses are held during the day. A selection of evening undergraduate courses is available, but it is not possible to complete any undergraduate degree by taking courses entirely in the evening.

To earn a bachelor's degree, students must have a cumulative GPA of 2.0 or better in all courses at NYU Tandon School of Engineering; additional details can be found in the section regarding academic standing and probation. Certain programs have additional grade requirements in specified courses or groups of courses. Most undergraduate engineering curricula require students to participate in team projects, including participation in team-based design projects. Students must participate in outcomes assessment, as described below.

Selection of a Major

Undergraduate students admitted to the NYU Tandon School of Engineering are encouraged to declare their major upon admission, although incoming first-year students may initially enter as "undeclared" students. First-year students wishing to consider several program options are encouraged to use their first semester to explore major fields in consultation with departmental advisers. While the first year curriculum is nearly uniform for all engineering majors and very similar for other majors, students who choose to delay selecting their major until the end of the freshman year must select courses in consultation with their academic advisers.

Students are free to change their major at any time, given that their academic standing is acceptable to the program into which they wish to transfer. However, changes in major may involve loss of credit and additional time to complete the degree. Students entering NYU Tandon with an undeclared major must declare any currently offered undergraduate major by the end of their first year.

Selection of a Minor

A minor is an approved concentration of academic study within a single discipline. In specified programs, undergraduate students may select a minor in a field distinct from, or related to, their major, with approval of advisers in both the major and minor fields. The name of the minor appears on students' transcripts if the approved coursework in the minor field have been completed with at least a 2.0 GPA. With the consent of a student's major department, some courses used to satisfy the minor requirements also may satisfy the required or electives course requirements in the student's major program. The names and associated requirements for minors are listed in the sections of this bulletin devoted to related major programs.

NYU Cross-School Minors

Visit the NYU Tandon Minors webpage for more detailed information on the cross-school minors available. NYU Tandon School of Engineering students have the opportunity to minor at other schools of NYU. An undergraduate student may minor in a discipline not typically offered at NYU Tandon. If a similar minor, in name and content, is offered at the School, students must receive permission from the specific academic department at NYU Tandon offering the minor in order to enroll in such a minor at NYU. With the consent of a student's major department, some courses used to satisfy the minor requirements may also satisfy the required or electives course requirements in the student's major program. Students will follow all policies, procedures and academic timelines of the respective NYU school.

Students must consult their major academic adviser to determine the applicability of courses towards their NYU Tandon School of Engineering degree. Students will need additional credits than the minimum required to satisfy their degree requirements if courses taken for a minor at NYU do not meet the requirements specified by a student's program of study. When declaring a minor, students will indicate the courses they plan on completing for the minor. For each course taken, students must obtain approval from their NYU Tandon academic adviser as well as the corresponding academic department at NYU Tandon.

Note that declaration of a minor does not constitute guaranteed enrollment in all classes; registration timelines and deadline need to be strictly followed.

Course Placement Evaluation

NYU Tandon School of Engineering requires incoming first-year students to complete placement and diagnostic examinations in writing and mathematics. All transfer students are required to take the Expository Writing Placement Exam and Mathematics Diagnostics Exam.

NYU Tandon placement and diagnostic evaluations are intended to ensure that each student receives the most pertinent instruction in areas necessary to successfully complete their degree program. Placement evaluations may supersede the results of Advanced Placement examinations and/or acceptable transfer credits from another institution of higher education as determined by the designated adviser and the department offering the course.

Mathematics Diagnostic Examination

The Mathematics Diagnostic Examination is an extensive test to profile students' knowledge and skills in basic and advanced mathematics. The Mathematics Department uses the scores on various

components of the exam to place students in relevant mathematics courses. Incoming first-year students (excluding those with AP credit) are placed into MA 902/MA 912, MA 914, MA 954, MA 1024, MA 1054, or MA 1324.

Writing Placement Examination

Both employers and accrediting organizations increasingly emphasize the need for students to have well-developed written and oral communications skills. No engineer or scientist can be an effective professional without the ability to communicate, not only with those in his or her own field, but also with professionals in other technical and non-technical fields, with private and public decision makers and with the general public. As such, NYU Tandon School of Engineering's degree programs involve frequent writing and speaking assignments across all areas of the curriculum. It is essential that all students have necessary background skills before enrolling in upper-division courses related to their professional studies.

To ensure that students are placed into the proper writing course, some admitted undergraduate students will be required to take the School's writing-placement exam. This essay exam is used to evaluate each student's writing ability and to ensure that he or she is placed into the appropriate writing course. On the basis of this test, students are placed into the standard first-year course, EXPOS-UA 1 Writing the Essay, or they may first be required to take one or more semesters of an introductory course in English (EXPOS-UA 20 and/or EXPOS-UA 21) before proceeding to the first-year courses.

If an incoming undergraduate student is not required to take the English placement exam, the student is placed in EXPOS-UA 1 Writing the Essay. Then, all students are given a first-day writing assignment during the first class period of all the writing courses. Individual instructors read and assess these assignments, and if a student seems to have been placed into an inappropriate class, the instructor consults with the Writing Program director and assistant director, and the student may be moved into a more appropriate course. Note: EXPOS-UA 20, EXPOS-UA 21 do not carry credits toward a degree. However, they do contribute to the full-time credit load during the semester in which they are taken.

Students who successfully complete EXPOS-UA 1 Writing the Essay EXPOS-UA 2 The Advanced College Essay. Students who successfully complete EXPOS-UA 21 move on to EXPOS-UA 4 International Workshop Writing 1.

Occasionally, however, a student who has completed EXPOS-UA 1 Writing the Essay if the instructor believes the student has achieved sufficient fluency in English. Students placed in EXPOS-UA 20 and/or EXPOS-UA 21 may take these courses during their first year. Typical schedules can be rearranged to accommodate this approach. University guidelines do not permit undergraduate students placed into EXPOS-UA 20 and/or EXPOS-UA 21 to progress to more advanced humanities courses until they receive a passing grade in aforementioned course(s).

Writing and Speaking Across the Curriculum

NYU Tandon School of Engineering has adopted a Writing and Speaking Across the Curriculum program to ensure graduates develop satisfactory communications skills. This program ensures that significant writing and speaking assignments are included in designated coursework throughout

students' undergraduate program and that course grades are influenced by the quality of presentation in addition to mastery of content.

To support this program, the Polytechnic Tutoring Center (PTC) houses the Writing Center for students; the Center is staffed by instructors, professional writers and qualified tutors. Students are encouraged to make an appointment to improve their writing and speaking skills.

Core courses such as EXPOS-UA 1, EXPOS-UA 2, EG-UY 1003, select humanities and social sciences electives, and all senior design projects are writing and speaking intensive. Each disciplinary curriculum identifies additional courses that fit into this category.

In addition to the required first-year writing curriculum, NYU Tandon students are required to complete 16 credits within the humanities and social sciences. One of these courses must be Writing-Intensive (designed with a "W"), and one must be at the 3000 or 4000 level. For more information about this requirement, and to see a list of courses, please refer to the Department of Technology, Culture and Society overview.

Core Curriculum

NYU Tandon School of Engineering's core curriculum is designed to provide all students with a solid education in the liberal arts, mathematics, basic sciences, and their major area of study. The goals of the core curriculum are to build students' critical, analytical, and communication skills; to build a strong foundation of knowledge; to introduce students to their major field of study; to expose students to other fields; and to prepare students for lives as responsible and engaged citizens. The core curriculum includes three areas of inquiry: (1) text, communication and social thought; (2) quantitative and scientific reasoning; and (3) innovation and problem solving.

ENGINEERING MAJORS: Areas of Inquiry

Area 1: Texts, Communication and Social Thought (24 credits)

- EXPOS-UA 1 Writing the Essay and EXPOS-UA 2 The Advanced College Essay
- Humanities and social science electives

Area 2: Quantitative and Scientific Reasoning (minimum of 34 credits)

- Mathematics: Every engineering student must complete a **minimum** of 16 credits of study in mathematics. The following mathematics courses are required of all engineering students:
 - MA-UY 1024 Calculus I for Engineers (or equivalent)
 - MA-UY 1124 Calculus II for Engineers (or equivalent)
 - MA-UY 2034 Linear Algebra and Differential Equations
- All engineering majors require a minimum of an additional 4 credits of mathematics coursework with required courses varying by major.
- Physics, Chemistry: The basic science core consists of **minimum** of 15 credits of study in the critical areas of chemistry and physics. The following basic science courses are required of all engineering students:
 - PH-UY 1013 Mechanics
 - PH-UY 2023 Electricity, Magnetism and Fluids
 - PH-UY 2121 General Physics Laboratory I
 - PH-UY 2033 Waves, Optics and Thermodynamics

- PH-UY 2131 General Physics Laboratory II
- CM-UY 1004 General Chemistry for Engineers
- Some engineering majors require additional coursework in the basic sciences. Refer to the List of Programs and Curricula for specific degree requirements for each major.

Area 3: Innovation and Problem Solving (9-10 credits)

- EG-UY 1001 Engineering and Technology Forum
- EG-UY 1003 Introduction to Engineering and Design
- CS-UY 1133 Engineering Problem Solving and Programming or CS-UY 1114 Introduction to Programming and Problem Solving
- Introduction to Major

NON-ENGINEERING MAJORS: Areas of Inquiry

Area 1: Texts, Communication and Social Thought (24 credits)

- EXPOS-UA 1 Writing the Essay and EXPOS-UA 2 The Advanced College Essay
- Humanities and social science electives

Area 2: Quantitative and Scientific Reasoning (requirement varies)

- Mathematics
- Physics, Chemistry, Biology, or other natural science course

Area 3: Innovation and Problem Solving (requirement varies)

- CS-UY 1133 Engineering Problem Solving and Programming or CS-UY 1114 Introduction to Programming and Problem Solving
- EG-UY 1001 Engineering and Technology Forum
- EG-UY 1003 Introduction to Engineering and Design
- Introduction to Major

The New York State Education Department (NYSED) requires undergraduate students to complete a minimum of 60 credits in liberal arts and sciences for the Bachelor of Science degree. These liberal arts and sciences courses constitute a foundation or “general education” in the humanities, natural sciences and mathematics, and social sciences. These courses are intended to provide a basis of knowledge outside of specified occupational or professional objectives; these courses are not intended to emphasize the development of skills in areas such as technology or computer programming. All undergraduate majors at NYU Tandon School of Engineering fulfill the NYSED 60 credit liberal arts and sciences requirement through courses in expository writing, humanities and social sciences, mathematics, and science (areas 2 and 3, above).

Engineering Competencies

All NYU Tandon School of Engineering undergraduate engineering programs are accredited by the Accreditation Board for Engineering and Technology (ABET). ABET identifies the following core competencies that every engineering program should address: (a) an ability to apply knowledge of mathematics, science and engineering; (b) an ability to design and conduct experiments and to analyze and interpret data; (c) an ability to design a system, component or process to meet desired needs; (d) an ability to function on multidisciplinary teams; (e) an ability to identify, formulate and

solve engineering problems; (f) an understanding of professional and ethical responsibility; (g) an ability to communicate effectively; (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context; (i) a recognition of the need for, and an ability to engage in, lifelong learning; (j) a knowledge of contemporary issues; (k) an ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Modifications to Curricula

Course Substitutions

On occasion, the curricula changes to reflect the latest knowledge and methods within a subject area, especially in the science, engineering and technology areas taught at the NYU School of Engineering. Students are informed of these changes by their major department.

NYU Tandon School of Engineering responds to changes in curricula and course content by addressing special situations and circumstances. To that end, the School occasionally needs to substitute one course for another specified in the curriculum for students to meet degree requirements. A student documents such substitutions on an Adjustment of Degree Requirements form available from the Office of the Registrar's website. Each substitution must be documented and approved by the student's major adviser and the Office of Academic Affairs. If a graduation checklist has been issued at the time of the substitution, the change should be formally entered on the checklist and approved by the major adviser and the Office of Academic Affairs.

Interruption of Study

NYU Tandon School of Engineering graduates must fulfill degree requirements using courses that meet current standards in the field. Accordingly, students have up to eight years to complete the degree requirements in effect when they first enrolled in an NYU Tandon School of Engineering undergraduate degree program. This time limit is irrespective of any leave of absence granted during the eight-year period. As courses continuously evolve, the School may replace courses in the original degree requirements with comparable courses with updated content. Should the School establish a new set of degree requirements for new students, continuing students may choose to satisfy those requirements. In such cases, the School of Engineering decides which portion of the new requirements may be satisfied by the courses students have completed and also rules on modification, if any, of the original eight year time limit.

If a student has exceeded or is about to exceed the eight-year limit and has not yet finished their degree requirements, they need to appeal for an extension in order to finish the remaining courses.

To appeal, the student must consult with their academic adviser and fill out the "Extension of Time Limit to Complete Degree" form. All courses remaining in order to complete their degree must be listed and the time frame in which they will be completed.

The form should then be signed by their academic adviser and the Associate Dean of Academic Affairs before it is submitted to the Registrar's Office.

BS/MS Program

Undergraduates with strong academic records in certain programs may apply for admission to the BS/MS Program, which leads to the award of both a Bachelor's and a Master's degree. While still undergraduates, this program allows students to make steady progress towards completing the two degrees for a lesser cost through a combination of earned AP credits, completed summer coursework, and additional credits over the limit completed each semester. Qualified students are typically considered for admission to the program during their junior year. In their remaining undergraduate semesters, they will complete some graduate coursework during regular terms and/or during the summer towards their desired MS degree.

Students interested in pursuing this option should speak with their undergraduate adviser as soon as possible. Some of the possible combinations of BS and MS majors available are described in the programs section of this bulletin. Students accepted to the BS/MS program are required to maintain a cumulative GPA of at least 3.5 for the duration of the undergraduate portion of the program and a 3.0 after matriculation into the graduate portion of the program; some departments may have higher GPA requirements. Additional information can be acquired from departmental advisers, including the specific sequence of courses necessary to complete the two degrees. International Students in F-1 or J-1 status must obtain permission and the necessary I-20/DS-2019 from the Office of Global Services before enrollment in the combined BS/MS program.

Dual Undergraduate Degrees

It is possible for students to earn two BS degrees in distinct disciplines. Special requirements for each degree are determined by the department's undergraduate academic adviser or department head, in accordance with the following rules:

- The set of courses includes all of the required courses for each degree. Some elective credits for one curriculum may be fulfilled with required credits from the other, given that sufficient senior/ graduate level electives are completed to provide depth in each discipline.
- The total credits required for both degrees must exceed those required for one of the degrees by at least one full year of credit. Courses satisfying requirements in both degrees may be counted only once for this purpose. Total credits required for the two degrees are, therefore, calculated using the following formula:

$$\text{Total Credits} = \text{Credits (Degree 1)} + \text{Credits (Degree 2)} / 4$$

This formula defines the minimum number of credits required. Some degree combinations may require additional credits. When the two majors are closely related, such as electrical engineering and computer science, applied physics and electrical engineering, etc., five years of study generally proves sufficient to earn both degrees. When the two degrees are less closely related, such as civil engineering and chemistry, electrical engineering and humanities, mechanical engineering and applied physics, etc., additional credits and more than five years is often required.

- Students working towards two degrees must (1) register in a "home" department that is responsible for the student's primary (first) degree, and notify the department of the intent to pursue a second degree, (2) apply for and receive admission to the second department in the same manner as a student wishing to change degrees, (3) obtain approval from both departmental faculty advisers when registering or withdrawing from coursework, (4) maintain

good academic standing in the University and in both academic departments and (5) complete all courses specified in the graduation checklist provided by each department with satisfactory grades.

- Both degrees may be simultaneously earned, or the primary degree may be earned first. Graduating with the honors distinction is separately determined for each degree. To graduate in the minimum amount of time with two degrees, students should select this option as early as possible. The courses of the two degree programs can then be interwoven to provide academic continuity and to satisfy prerequisites in a timely fashion. Please note that many students prefer to earn a single bachelor's degree followed by a master's degree in a different, but related, discipline. Students interested in pursuing a dual degree should speak with their undergraduate advisers, as not all degree combinations can be conveniently packaged in this manner.

Honors Distinctions

Honor Societies

Students with superior academic records and co-curricular achievements may be selected to join one of the NYU Tandon School of Engineering's chapters of a national honors society in their junior or senior year. Closely allied to the professional and technical societies, these honors societies encourage and recognize outstanding scholarship and leadership.

Participating Societies at the NYU Tandon School of Engineering:

Chi Epsilon - Civil Engineering
Eta Kappa Nu - Electrical Engineering
Omega Chi Epsilon - Chemical Engineering
Pi Mu Epsilon - Mathematics
Pi Tau Sigma - Mechanical Engineering
Sigma Xi - Research
Tau Beta Pi - Engineering
Upsilon Pi Epsilon - Computing Sciences

Degrees with Honors

The NYU Tandon School of Engineering adheres to New York University's Latin Honors requirements. Latin Honors are given to Baccalaureate degree recipients who have achieved a high cumulative grade point average (GPA) and satisfied the school's residency requirements.

The GPA cutoffs for each category are determined by the combined GPA distribution from the preceding academic year. The cutoff for summa cum laude is the GPA included with the top five percent of the previous year's graduating class. The cutoff for magna cum laude is the GPA included within the next 10 percent of the previous year's class. The cutoff for cum laude is the GPA included within the next 15 percent of the previous year's class.

The cumulative grade point average and residency requirements for Latin Honors are published on the University Registrar's Latin Honors site. Please refer to the figures associated with the NYU Tandon School of Engineering.

Undergraduate Credits

Residency

To satisfy residency requirements for the BS degree, NYU Tandon School of Engineering students must complete a minimum of 64 credits at the University in approved coursework. Departmental advisers will assist students in selecting courses required for degree completion. In addition, students must complete their final 32 credits at the University, unless approved for a special term abroad. In regards to minors, one-half of the coursework must be completed at the NYU Tandon School of Engineering. All transfer credits are subject to the NYU Tandon School of Engineering's transfer credit policy and process.

Transfer Credits from other Undergraduate Institutions

Students who have completed undergraduate coursework at other universities prior to beginning their studies at NYU Tandon School of Engineering are encouraged to transfer credits over. NYU Tandon awards transfer credit for relevant courses completed satisfactorily at other accredited institutions. Students transferring into the NYU Tandon School of Engineering must have all outside transcripts examined by the Undergraduate Admissions Office and an adviser from their major department to determine the acceptability of individual substitutions and general acceptance of credits from their former institution(s). Much of this can be accomplished during the application process if the student's record is complete. All evaluations of transfer credits must be completed by the end of the student's first semester of registration at the NYU Tandon School of Engineering. Some programs may choose to delay approval of transfer credits until students demonstrate satisfactory progress at the School of Engineering.

Undergraduate transfer credit is not given for any course in which a grade less than C has been earned. In addition, students completing a course at the School of Engineering for which transfer credit already has been given automatically forfeit the transfer credit for that course.

The contents and standards of courses vary from university to university. Thus, some transfer students find after a semester's work at NYU Tandon School of Engineering that they are better prepared for advanced courses if they re-enroll in a course at NYU Tandon for which they have been given transfer credit. Students may be required to enroll in such a NYU Tandon course after consulting with their academic adviser. In some instances, course requirements may be waived for students who demonstrate sufficient knowledge of specific course content through either written or oral examination given by the academic department offering such course. In such cases, no credit is awarded, but students are allowed to submit a more advanced course to satisfy degree requirements. This approach differs from "credit by examination," described later in this section.

Grades of courses for which transfer credit is given are omitted in computing a student's cumulative or current semester GPAs.

Dual Degree Program with the College of Arts and Science: The 3+2 Program

General Information

NYU's College of Arts and Science offers a dual-degree program in science and engineering with the NYU Tandon School of Engineering. This program affords highly qualified and motivated

students who are technically oriented the opportunity to pursue both a liberal arts program with a major in science and a traditional engineering program. The program is ideal for students interested in science and engineering who are also eager for a liberal arts experience before entering an undergraduate engineering environment. Upon completion of this five-year program, students receive the Bachelor of Science degree from the College of Arts and Science at New York University and the Bachelor of Science degree from the NYU Tandon School of Engineering.

The available dual-degree combinations are as follows:

- BS in Biology/BS in Chemical and Biomolecular Engineering
- BS in Chemistry/BS in Chemical and Biomolecular engineering
- BS in Computer Science/ BS in Computer Engineering
- BS in Computer Science/ BS in Electrical Engineering
- BS in Mathematics/ BS in Civil Engineering
- BS in Mathematics/ BS in Computer Engineering
- BS in Mathematics/ BS in Electrical Engineering
- BS in Mathematics/ BS in Mechanical Engineering
- BS in Physics/BS in Civil Engineering
- BS in Physics/BS in Computer Engineering
- BS in Physics/BS in Electrical Engineering
- BS in Physics/BS in Mechanical Engineering

Detailed programs of study for each of the curricula are available from the NYU's College Advising Center, Silver Center, 100 Washington Square East, Room 905.

Students who are interested in this program apply directly to NYU's College of Arts and Science as a first year student, indicating their interest in this program on their application. Students that matriculate into Tandon as a first year student are ineligible to join. Application materials for this dual-degree program may be requested from New York University, Office of Undergraduate Admissions, 665 Broadway, 11th Floor, New York, NY 10012-2339.

The Academic Program

Students accepted into the program spend their first three years of study in the College of Arts and Science (CAS) at Washington Square (WSQ). In the first year at CAS, the different curricula call for many of the same courses. This gives students time to consult with faculty at both schools before committing themselves to a particular science/engineering major.

During freshman orientation, if they have not already done so, students select a major area for their study at CAS from the disciplines of biology, chemistry, computer science, mathematics, and physics. In their first year, students will have the opportunity to change this major and to reflect on their choice of engineering major. In the spring of the third year, an orientation program helps students prepare for the transition to the School of Engineering in the fourth year.

In the first three years of the program, students satisfy their core liberal arts requirements and also take some of the NYU Tandon School of Engineering courses required for their choice of engineering major. Students may elect to withdraw from the dual-degree program in engineering and complete only the College of Arts and Science general and major requirements at New York University. The final two years of study are undertaken at NYU Tandon School of Engineering's site

in Brooklyn where students complete the remaining technical courses required for their engineering major.

Articulation Agreements

To provide students with alternative pathways to a BS degree from the NYU Tandon School of Engineering and to facilitate the transfer process, the School has developed cooperative programs with other institutions. Students completing approved programs at these institutions with sound academic achievement are guaranteed admission to the School. Students interested in learning more about the cooperative programs should contact the Office of Undergraduate Admissions. Currently, the NYU Tandon School of Engineering offers an articulation agreement with Brooklyn College.

Articulation with Brooklyn College

The present articulation between Brooklyn College and the NYU Tandon School of Engineering is for the first two years in the fields of Civil, Chemical, Computer, Electrical and Mechanical Engineering. Further information may be obtained from Brooklyn College or the NYU Tandon's Office of Academic Affairs.

Transfer Credits while in Residence

Undergraduates at NYU Tandon School of Engineering are expected to complete all coursework at the School. Exceptions are rare and only made in cases where NYU Tandon School of Engineering does not offer courses integral to the attainment of students' academic goals.

To obtain credit for courses taken elsewhere while enrolled at NYU Tandon School of Engineering, students must obtain written permission from the major academic adviser, the department head of the course for which transfer credit is requested and the Office of Academic Affairs. This must be done before registering for the course at another institution. Forms for such permission are available on the Registrar's website.

The following requirements apply to all courses taken outside of NYU:

- The outside institution must be accredited.
- Grades earned must be C or better for undergraduate courses.
- Pass/fail courses are not acceptable under any conditions.
- Only credits are granted; grades are omitted in computing cumulative or current semester GPAs.

Credit for Courses at Other Schools and Divisions of New York University

Undergraduate students at the Tandon School of Engineering may complete coursework in other undergraduate divisions of New York University and have credits for these courses applied to their degree.

Students may take a total of 4 courses or 16 credits in other divisions, including any courses for particular minors approved by the faculty. Students seeking additional credits beyond the 4-course limit must file a petition with the Office of Academic Affairs via and Degree Adjustment form.

Exceptions will be made for students pursuing approved cross-school minors that require additional coursework.

Courses in other divisions that duplicate the contents of a NYU Tandon School of Engineering course do not count toward degree completion. In addition, except in rare cases, coursework completed in another division cannot be used to satisfy a student's writing-intensive humanities and social science requirement. For this reason, students must meet with their departmental advisor before registering for any courses in other divisions. If a course is not approved, students will not receive credit for it. Independent study or internship courses taken in other divisions of the University in general do not count toward degree completion. Students are encouraged to consult with their academic advisor regarding applicability of such courses towards their degree requirements.

Study abroad coursework and courses offered at or by other schools that are required for a major here at Tandon do not count towards this limit.

Undergraduate Validation Credits

When it is unclear whether a course taken outside of NYU Tandon School of Engineering is suitable for transfer credit, students may qualify for transfer credit by passing a validation examination. Permission to take such an examination must be recorded in advance on the student's transfer evaluation form at the time of application to NYU. The format of the examination is at the discretion of the department giving the course. Scheduling of the examination is by mutual agreement, but in no event more than one calendar year after the student begins study at the NYU Tandon School of Engineering. A grade of C or better is required to validate course credits for undergraduate students. An examination may not be taken more than once. Students who register for or attend the course at NYU Tandon School of Engineering forfeit the right to take a validation examination.

Advanced Placement Credits

NYU Tandon School of Engineering grants students credit for approved Advanced Placement (AP) courses in high school, given acceptable performance on AP examinations. Students must request evaluation of AP credits by no later than the end of their first semester of matriculation. Credit also may be granted for college preview courses at the NYU Tandon School of Engineering or other universities while a high-school student if these courses are relevant to the student's degree program and acceptable grades were achieved. Grades for advanced placement or college preview courses are omitted in computing the cumulative or current semester GPAs.

Credit by Examination

Undergraduate students with an outstanding record or with specialized competence may establish a maximum of 16 credits toward the baccalaureate degree by passing comprehensive examinations. Each department determines the courses in which such an examination is available and the examination format. Students must obtain the approval of the department giving the course, the department of major study and the Office of Academic Affairs.

A grade of B+ or better is required to achieve credit by examination. Students registering for or attending a course at the NYU Tandon School of Engineering may not subsequently take the examination for credit for the course or for a course with similar content. The examination may be taken only once.

Students pay a fee to the Office of Records and Registration before each examination and will receive the form to take the exam after making the payment. The course and credits are posted on student's permanent record without a grade and do not count toward the minimum-residence requirement for the bachelor's degree or toward the GPA.

Undergraduate Thesis

The undergraduate thesis allows students to apply knowledge gained in their major field of interest and use it to plan, conduct and report original research. The thesis may be a discourse upon a subject included in students' courses of study, an account of an original investigation or research, or a report on a project or an original design accompanied by an explanatory statement.

The undergraduate thesis is optional except for students in the Honors Program, who are required to complete an undergraduate thesis. All undergraduate students who plan to undertake a thesis should report to the head of their major department with their choice of a thesis topic at least one year before graduation. Department heads approve requests and appoint a thesis adviser. Students should contact their thesis adviser immediately and register for the thesis during the next registration period. Thereafter, the student must register for the thesis every fall and spring semester until it is completed and accepted and the final grade is entered into the student's permanent record. A student must take a minimum of 3 credits of thesis work for an undergraduate thesis.

Students must submit a bound BS thesis to the Office of Academics Affairs as outlined in the document entitled "Regulations on Format, Duplication and Publication of Reports, Theses and Dissertations," available in the Office of Academics Affairs. All theses and results obtained become the property of the School.

Graduation

Graduation Checklist

Academic advisers of undergraduate students nearing completion of their degree requirements receive a graduation checklist that lists courses in progress and courses remaining to be completed for the degree. After the list is approved by the major academic department, the student receives an e-mail notifying them of their graduation status.

Application Process for the Bachelor of Science

To be awarded a Bachelor of Science degree at the School of Engineering, students must file a formal graduation application via the Albert Student Center. Application deadline dates are published on the University Registrar's website. Students who do not file by the published deadline date become candidates for the next conferral period.

Degrees are certified and diplomas issued three times a year, typically in January, May, and September. Commencement is held once a year, usually in May. All work for the degree must be completed and submitted before the graduation date.

Diplomas

Diplomas are mailed to the student about eight weeks after the degree conferral date. Diplomas are issued only once, subject to rare exceptions made on a case-by-case basis. Replacement diploma procedures and fees are published on the University Registrar's website. Replacement diplomas for the NYU Tandon School of Engineering will be printed with the school name at the time of the student's graduation.

Transcripts

The issuance of transcripts and generally the release of any information about a student are subject to the provisions of Public Law 93-380, the Family Educational Rights and Privacy Act of 1974, as amended. Unless NYU Tandon School of Engineering's disclosure policy permits otherwise, official transcripts of the scholastic record are issued only upon the submission of a written request or upon the submission of a signed release from the student.

Unofficial transcripts are available to students through the Student Self-Service system. Those students without access to the Student Self-Service system may submit a written request for an unofficial transcript. A fee is charged for each unofficial or official transcript issued. Transcripts can be requested online.

NYU Tandon School of Engineering reserves the right to withhold a transcript if a student fails to meet financial indebtedness to the School.

Upon graduation, students should review their transcripts carefully and report any errors to the Office of the Registrar before the record is sealed.

Participation in Commencement

All students are permitted to participate in both the New York University Commencement Ceremony and the NYU Tandon School of Engineering Commencement Ceremony in May of each year.

There is a Dean's Exception for the All-University Commencement whereby graduation candidates who have no more than two courses outstanding to complete their degrees may petition their school's Dean of Student Affairs for eligibility to participate as long as these courses are completed by the end of the summer. Read more about the Dean's Exception policy and process on the NYU Commencement website.

The NYU Tandon School of Engineering will follow the same guidelines set by the Commencement Office for participation in the May ceremony as a Dean's Exception. That is to say, if a student is deemed a Dean's exception for University-wide Commencement Ceremony, they are also permitted to participate in the NYU Tandon School of Engineering Commencement Ceremony. Please note that students with more than two courses outstanding will not be granted an exception and will be able to graduate in either September or January dependent upon when they complete their degree requirements. Please visit the NYU Registrar's Graduation website for exact dates. Those students will then be able to participate in the May ceremonies of the following year.

Dean's Exception Forms will be available to NYU Tandon School of Engineering students at the Office of Student Affairs (LC 232) each spring semester.

Class Standing for Undergraduates

Students are classified at the end of each semester by the Office of the Registrar on the basis of earned and/or approved transfer credits beginning September 1, as follows:

Freshmen	1 - 27 credits
Sophomore	28 - 61 credits
Junior	62 - 94 credits
Senior	95 or more credits

Academic Year Full Time

Undergraduate students registered for 12 or more credits per semester are categorized as full time. The normal course load for full-time undergraduate students is 14-18 credits.

For certain types of attendance and enrollment certifications, some students who are registered for less than 12 (undergraduate) credits may be certified as full time-specifically undergraduates pursuing Institute-authorized full-time, full-semester co-op work assignments. A form to establish full-time equivalency is available from the Office of the Registrar's website.

Academic Year Part Time

Students registered for less than 12 credits per semester (except summer) are categorized as part time. Part-time students pay tuition at the prevailing per-credit rate and are ineligible for most financial assistance and scholarship programs.

Summer and Intersession

Students may register for up to 8 credits during each six-week summer term and for no more than 16 credits for the combined 12-week summer term. Six credits for a given summer term is considered full-time status.

Undergraduate International Students

Full-Time Status, Program and Degree Changes, Employment

To maintain non-immigrant student status, international students must enroll full time, taking at least 12 credits on the undergraduate level for each fall and spring semester. Moreover, they may only register for one online course per semester. Students wishing to take more than one online course per semester must obtain prior approval from the Office of Global Services (OGS). Students may take less than a full course of study if fewer credits are needed during the last semester to graduate or for valid academic and medical reasons. All reasons for exceptions must be approved in writing by OGS before the last day of late registration each semester so that courses can be added to students' schedules if necessary.

Students in F-1 and J-1 status must obtain written permission from OGS to withdraw from classes, if the withdrawal will result in less than a full-time course load, or to take a leave of absence. They must also obtain written permission and a pertinent I-20/DS-2019 form from OGS before enrolling in a new degree program. The process of withdrawing from a course, changing degree level or taking a leave of absence through the Office of the Registrar keeps a non-immigrant student in good standing only with the Institute, but not with the U.S. Immigration and Citizenship Services (USCIS). In addition, students who plan to work as part of their coursework or as part of an internship placement are required to obtain prior approval from OGS for any such employment.

Failure to comply with the immigration requirements for full-time status, course withdrawals, degree changes and/or leave of absence and employment violates the nonimmigrant student status and makes a student ineligible for any benefit of that status. According to the USCIS, lack of compliance may also result in deportation.

Policies on Undergraduate Grading and Grades

Computing the Grade-Point Average (GPA)

The Office of the Registrar determines the GPA of undergraduate students according to the following numerical values assigned to letter grades:

Grade	Point Value	Description
A	4.0	Excellent
A-	3.7	Excellent
B+	3.3	Good
B	3.0	Good
B-	2.7	Good
C+	2.3	Passing
C	2.0	Passing
C-	1.7	Deficient, but passing
D+	1.3	Deficient, but passing
D	1.0	Deficient, but passing
F	0.0	Failing

S	Satisfactory
U	Unsatisfactory
W	Withdrawal
I	Incomplete, converts to F after 180 days
AUD	Audit
P	Pass

In computing GPAs, NYU School of Engineering does not consider or count courses graded W, I, S or U toward the total credits passed or earned. GPAs are computed by multiplying the numerical grade in each course by the number of credits for each course, adding these products for the courses taken and then dividing this sum by total number of credits represented by courses considered.

The W and I grades are described in greater detail in subsequent sections. Grades S or U are used to indicate progress in multi-semester research projects or theses, or for non credit-bearing remedial or other courses. Undergraduates enrolled in graduate courses may not receive grades of D or AUD.

Course Withdrawal: The W Grade

Students may withdraw from a course or courses without academic penalty until the published withdrawal deadline of the normal fall or spring semester. Students should process their own withdrawals online via Student Self-Service. No approvals are required, but students are encouraged to consult with their academic advisers as withdrawing from certain courses may delay their planned graduation date. When the course duration varies from the norm, such as in six-, nine- or 12-week courses, withdrawal must be completed before two-thirds of the sessions are completed. Withdrawals must be processed online by 11:59 p.m. on the withdrawal deadline indicated on the published Academic Calendar. Withdrawn courses remain on the student's transcript with a grade of W and are not calculated into the GPA. Once entered on the student's record, a W cannot be changed to any other grade. An F grade is recorded for any student who ceases to attend a course without formally withdrawing in the required fashion by the required deadline. Students are also encouraged to consult with Financial Aid before withdrawing from a course, as it may affect their status and eligibility for aid.

Auditing Classes

Undergraduate students may be allowed to audit certain classes in order to fill the gap which may exist in their prior course work. Approval of the academic department is required prior to auditing a class. The credits for the course do not count as a part of the student's semester credit load. Students auditing a course will not receive a grade for the course and the course will be annotated by AUD without counting towards student's GPA calculations. Students who decide to audit a class must do so during their initial registration for the class by filling out the form available from the Office of the Registrar; this option cannot be changed once selected. Note that these courses must still be paid for.

Incomplete Grades

If a student cannot complete coursework at the requested time due to a valid reason, such as an illness or other critical emergency, the instructor may give a grade of Incomplete/I. In such cases, the instructor and the student must develop a detailed plan for completion which includes a specific completion date. Ordinarily, this date should not extend beyond the intersession, in fairness to students who finish course requirements on time and to ensure that students complete prerequisites for advanced courses. An I grade lapses into an F if the student fails to complete the work within the specified completion time line, or at most by 180 days after the end of the semester in which the I was given. All I grades must be converted before graduation.

The grade of Incomplete/I is used sparingly and only in cases with valid reasons, not merely because students have planned poorly or overloaded themselves. An I grade should not be issued if a student is unable to complete the course requirements without attending or participating in the course a second time. If the student re-registers for a course in which an I grade was given, the I grade lapses to an F. If successful resolution of an I grade would require the repetition of any course or portion of a course, the student should consider formally withdrawing from the course.

Change of Grade

Grades on file with the Registrar at the end of the semester, with the exception of incomplete (I) and temporary grades (S or U), are considered final unless an error in calculating or recording the grade is discovered. No correctly reported final grade may be changed based upon re-taking an examination or completion of additional work. Incomplete (I) grades are handled according to the policies described under Incomplete Grades. Temporary grades (S or U), used for continuing projects, thesis or dissertation, will be converted to standard letter grades upon completion of the project, thesis or dissertation. Once recorded with the Registrar, these grades are treated as all other final grades. If an error in calculating or reporting a grade is discovered, the instructor will submit the change of grade request to the Department Head. Upon approval of the Department Head, the request will be submitted to the appropriate Associate Dean for approval. Any incorrectly assigned grade must be corrected within one semester.

Repeating Courses

If an undergraduate student takes a course two or more times, only the second and subsequent grades will count toward their GPA. This policy holds regardless of the first and second grades earned, even when the second grade is lower than the first. The repeated course must be taken within one year of the first course, or at the first time it is offered, where a course is unavailable to repeat within one year. If the student first repeats the course more than one year after taking it initially, and the course has been offered, all grades earned in the course will be counted in the student's GPA. If a student earns a passing grade and subsequently fails the course, the passing grade can be used to satisfy degree requirements.

No undergraduate course may be repeated more than twice, for a total of three attempts. If a student earns an F grade in each of their three attempts in a prerequisite course or a degree requirement, the student is then academically disqualified.

Undergraduate Academic Standing and Probation

Dean's List

Undergraduate students who achieve a term GPA of 3.4 or higher in both the fall and spring semesters over the course of an academic year (Fall and Spring semesters only), with no grades of F, I or U for the semester, and are otherwise in good academic standing, are commended by the Department of Academic Affairs and placed on the Dean's List. This list is posted following the spring semester each year. Only those who complete 12 or more credits during the fall and spring semester are eligible. Students who include project courses in their 12 or more credit programs are also eligible, provided that these courses represent no more than one-half of the credit load for a given period and all of the aforementioned requirements are met. Non-degree credit courses, such as EN 1090, may count toward the 12-credit requirement. The Dean's List notation appears on the student's permanent record. Students who receive a grade of F and then repeat the course in a subsequent semester, thereby excluding the first grade from the GPA calculation, are not eligible for the Dean's List. However, students who convert a grade of I to a regular letter grade or receive a change of grade after a given semester that would then qualify them for the Dean's List may retroactively receive Dean's List honors by bringing the change to the attention of the Department of Academic Affairs.

Any change of grade should be finalized within one semester to be considered for the Dean's list.

General Academic Standing

To remain in good academic standing, undergraduate students must maintain term and cumulative GPAs of 2.0 or greater. In addition, students must successfully complete a minimum number of credits for each semester of full-time study, excluding summers and mini-sessions. In the case of part-time students, a semester indicates the point at which 12 or more credits are undertaken. Thus, the first semester of study ends when 12 credits are accumulated; the second semester is calculated from that time onward until 24 credits are accumulated. According to these semester equivalents, grade-point requirements for part-time students follow those for full-time students.

The minimum number of cumulative credits to be achieved by the close of each semester of full-time study appears in the following table.

Minimum Credits and Minimum GPA Required by Semester of Full-Time Study

Number of Full-time Semesters Completed	Minimum Required Cum Grade Point Average	Minimum Credits to be Earned
1	1.50*	8
2	1.50*	16
3	1.50*	28
4	1.67	40
5	1.78	56

6	1.88	68
7	1.95	84
>8	2.00	96

* Any time a student's cumulative GPA falls below 1.5 they are placed on Final Probation regardless of how many credits they have completed.

In calculating the number of successfully completed credits:

1. Courses for which a student received an F grade do not count toward the minimum credits earned.
2. If a student receives an F grade in a course which they repeat within one academic year, their GPA will be recalculated using the second grade earned and the first grade of F will be removed from the GPA calculation.
3. Credits with an I grade will be counted toward enrollment for one year. Thereafter, any I grade that has not been changed by the instructor on record will automatically become an F grade.
4. Credits assigned a W grade do not appear in the calculation of credits undertaken, earned or successfully completed.
5. Transfer students will enter this table from the point at which their transfer credits place them.

A second requisite for enrollment is the maintenance of a 2.0 GPA or better or performance approaching 2.0 in a steady and realistic fashion. The table above contains the absolute minimum cumulative GPA to be achieved by the close of each semester of full-time or full-time equivalent enrollment.

The Department of Academic Affairs regularly monitors all undergraduate students, reviews their academic records after each semester, and informs students' academic adviser or other representatives from the their major department of the results of that review. Students identified as being in academic difficulty may not register for more than 12 credits per semester unless otherwise approved by their adviser. Students in academic difficulty are placed on academic probation following the steps and actions described below.

Academic Warning

Students whose midterm grades show they are in danger of failing a course receive e-mails of academic warning. The e-mails provide guidance for the student and invite them to meet with their academic adviser to discuss their academic performance and what steps to take to complete their course(s) successfully.

Academic Probation

Students are placed on academic probation when (1) their semester and/or cumulative GPAs fall below 2.0, but remain above the minimum standards as outlined above or (2) their number of successfully completed credits falls below the minimum standards as outlined above. Students falling into these categories are notified and directed to meet with their advisers. Students placed on

academic probation are limited to a maximum of 18 credits per semester while on probation, unless otherwise approved by their adviser and the Office of Academic Affairs.

All first-year, first-time probationary students must enroll in SL 1020, the Academic Skills Seminar. The seminar consists of eight one-hour sessions, meeting weekly and taken on a pass/fail basis. SL 1020 helps students develop and enhance an awareness of their individual learning styles, study skills and time management techniques so they may be more successful students and return to good academic standing. Topics include establishing a mind-set for success, discussing career opportunities, setting goals, managing time, overcoming procrastination, learning study and test-taking skills and self assessing. SL 1020 is offered in small, interactive group sessions to support students as they develop strategies for academic success.

Final Probation

Students whose academic record indicates an unacceptable level of academic progress may be placed on final probation. Notified of their standing, these students must meet with their adviser to determine a study program and are limited to a maximum of 12 credits while on final probation to improve their academic performance. Should a final probation student need additional credits to satisfy the full-time requirement, he or she may be allowed to register for another course with the approval their adviser and the Office of Academic Affairs, but will be limited to a maximum of 14 credits. Academic Disqualification results from failure to improve performance and to meet the minimum progress requirements as outlined in the minimum-progress table above.

Disqualification

The Academic Standing Committee, comprised of members of the Department of Academic Affairs, faculty and a representative of the student's major department, shall jointly disqualify from the Institute any student whose cumulative GPA or number of credits successfully completed falls below the approved minimum shown in the above table for two consecutive semesters. Additionally, a major department may disqualify a student at or above the minimum listed if it is indicated that continuation will not lead to a successful completion of degree requirements. If a student is disqualified, they will be notified via e-mail.

Extenuating circumstances, such as serious medical problems (physical or psychological), must be documented by the Office of Student Affairs and can lead to a one-semester waiver of these criteria. Performance in the subsequent semester must meet minimum standards. Such arrangements must be made with the head of the major department and the Office of Student Affairs.

No undergraduate course may be repeated more than twice, for a total of three attempts. If a student earns an F grade in each of their three attempts in a prerequisite course or a degree requirement, the student is then academically disqualified.

Disqualification Appeal

Students who would like to appeal their academic disqualification may begin the appeal process immediately. Students must begin the disqualification appeal process a minimum of three weeks before the first day of classes of the semester immediately following their disqualification. If students do not begin the appeal process by this deadline they must wait until the next semester before they can reapply for readmission to the School and initiate the appeal process.

Leave of Absence and Withdrawal from the School

Leave of Absence

The NYU Tandon School of Engineering expects its students to maintain continuous registration in an academic program. However, the school recognizes that it is sometimes necessary or desirable for a student to take a leave from enrollment for a period of time. Should extenuating circumstances necessitate time away from the university, students are encouraged to consider a leave of absence. The duration of the leave will be a minimum of one academic semester, or an equivalent four month period, to a maximum of two academic semesters or the equivalent in months (8 months). A leave does not extend the time period permitted for obtaining a degree. The Leave of Absence policy may not be used in lieu of disciplinary action to address any violations of University rules, regulations, policies, or practices, nor may it be used in lieu of academic probation or disqualification.

Medical Leave of Absence

If a student and physician agree that a medical leave of absence is in the student's best interest, a physician should make a recommendation to the Associate Dean of Student Affairs at the NYU Tandon School of Engineering for a withdrawal from the semester and a leave of absence. To officially request a leave, the student must submit a Medical Leave of Absence Request Form, along with appropriate supporting documentation, to the Office of Student Affairs, which is located in the Dibner Building (5 MetroTech Center).

A request for a medical leave of absence must be accompanied by documentation from a health care provider and may require additional evaluation by the Medical Services Division of the Student Health Center. A leave is official only after the student receives final written approval from the Associate Dean of Student Affairs. This letter will clarify the steps necessary for reentry into the School of Engineering. Please feel free to contact the Office of Student Affairs (646.997.3773) regarding inquiries related to medical leave of absences.

Psychological Leave of Absence

If a student needs to request a psychological leave of absence, he or she must schedule an appointment with a counselor at the University Counseling and Wellness Services Center by calling 646.997.3456. Counseling and Wellness Services is located within the basement of Roger's Hall (6 MetroTech Center).

Should the student and counselor agree that a leave of absence is in the student's best interest, the counselor should make a recommendation to the Associate Dean of Student Affairs at the School of Engineering for a withdrawal from the semester and a leave of absence. To officially request a leave, the student must submit a Medical Leave of Absence Request Form to the Office of Student Affairs, which is located in the Dibner Building (5 MetroTech Center), Room LC 232.

A leave is official only after the student receives final written approval from the Associate Dean of Student Affairs. This letter will clarify the steps necessary for reentry into the School of Engineering. Please feel free to contact the Office of Student Affairs (646.997.3773) regarding inquiries related to psychological leaves of absences.

Personal Leave of Absence

A personal leave of absence may be requested for reasons unrelated to medical or psychological conditions. Personal leaves are voluntary and apply to issues related to national service or personal circumstances. The NYU Tandon School of Engineering is committed to handling requests for personal leaves in a reasonable manner. Please note that personal leaves will not be granted for graduate students who are not in good academic standing with the University.

To officially request a personal leave of absence, the student must submit a Personal Leave of Absence Request Form to the Office of Records & Registration, which can be found online via Albert.

A personal leave is official only after the student receives final approval from the Office of the University Registrar. This letter will clarify the steps necessary for reentry into the NYU Tandon School of Engineering. Please feel free to contact the Office of Records & Registration regarding inquiries related to personal leave of absences.

Applying for a Leave of Absence

As a general rule, leave of absences must be requested prior to the first day of the classes. Thereafter, requests will be evaluated on a case-by-case basis. Please note that leaves are not granted retroactively for past semesters.

After the conclusion of the Drop/Add period, students withdrawing for the term will receive grades of W in all courses. The grade of Incomplete is not possible for a student on leave, and the student is not permitted to make up work for courses after a W is assigned, as it is a terminal grade. Students on leave of absence are not permitted to complete coursework outside of the university while on leave, unless taking an LOA to study abroad through Direct Enrollment. Study abroad through direct enrollment must be preapproved by the Office of Academic Affairs.

Returning from a Medical Leave of Absence

If the reason for a leave was medical or psychological, the student must follow the steps outlined in the letter provided by the Office of Student Affairs.

Returning from a Personal Leave of Absence

A student granted a personal leave of absence does not need to submit a formal application for readmission as long as he or she returns to the School within the agreed-upon time. Any student who fails to resume studies after the expiration of an approved leave of absence will be discontinued and would have to apply for readmission. Please note that readmission is never guaranteed.

Important Related Issues

Students should be aware that a leave of absence may affect financial aid, University housing, and future student status. While on leave, students are responsible for meeting all financial aid and housing deadlines relevant to returning students. Students receiving federal loans (SSL, SLS, and Perkins) should note that a leave of absence does not certify one as an enrolled student for the purpose of loan deferral. The contact information for relevant offices can be found below.

- [NYU Housing](#) - If you reside in University housing, you should contact the NYU Housing at housing@nyu.edu to determine how the leave may impact your housing license and future ability to participate in the housing lottery.

- Financial Aid - Students are advised to find out how the leave of absence may affect their scholarship and financial aid award. Please contact the Financial Aid Office within Student Link at the Dibner Building (5 MetroTech Center), Room 201 or at financial.aid@nyu.edu to clarify your responsibilities and status.
- Tuition - If a student is granted a leave after the semester has begun, the same graduated refund schedule applying to withdrawal from classes is in effect. For the graduated refund schedule and policies, please refer to the schedule posted online: <http://www.nyu.edu/life/resources-and-services/nyu-studentlink/bills-payments-and-refunds/refunds-and-withdrawals.html>. The refund schedule is strictly enforced.
- Office of Global Services - International Students should contact the Office of Global Services immediately for information regarding visas and exit deadlines. Please contact OGS by visiting their office at the Dibner Building (5 MetroTech Center), Room 259 or by calling them at 646.997.3805 for more information.

Withdrawal

Total Withdrawal

Undergraduate students must notify the Office of Records and Registration if they elect to withdraw from the University prior to the published deadline and during a semester in which they are registered. No total withdrawal is official unless the online form, which is available in Albert Self Service, is submitted and approved by the Office of the Registrar. Mere absence from courses does not constitute official withdrawal, but will lead to F grades recorded for courses not completed. To receive W grades for the semester, the withdrawal must be completed by the withdrawal deadline indicated on the academic calendar.

Involuntary Withdrawal

NYU Tandon School of Engineering is concerned about the health, safety and well-being of its students. Students judged to be a threat to themselves or to others may be withdrawn involuntarily from the School of Engineering. The School seeks, whenever possible, to allow such students to continue as active students if they agree to undergo professional care. Full details on this policy are available from the Office of Student Affairs.

Automatic Withdrawal

Undergraduates who do not file a formal leave of absence and who are not continuously enrolled are automatically withdrawn from the University. Students in this category must apply for readmission. If readmission is granted, students will be governed by the catalog and rules in effect at the time of readmission.

Readmission

Students applying for readmission must apply through the Office of Undergraduate Admissions. Applications for readmission will be sent to the student's academic department for evaluation. The academic department in consultation with the Office of Academic Affairs and Associate Dean of Academic Affairs will determine whether the student is eligible to continue his/her studies at NYU Tandon School of Engineering.

GRADUATE ACADEMIC REQUIREMENTS AND POLICIES

This section details the general School-wide degree requirements that apply to all NYU School of Engineering graduate degrees. Academic departments may place additional requirements on individual degrees. Such additional requirements are explained in the programs section of this catalog. In no case may a department specify requirements less stringent than those indicated here.

Outcomes Assessment

NYU School of Engineering conducts outcomes assessment activities to monitor student academic achievement, effective teaching methods and continuous improvement of the School, as well as to comply with accreditation standards. To obtain periodic measurements of student perceptions and intellectual growth, graduate students are strongly encouraged to participate in surveys, focus groups, interviews or related activities. While individual input is collected, data resulting from these assessments is published only in aggregate form.

Definition of Credits

Graduate studies are expressed in terms of credits. One 50-minute period of graduate class work for a 15-week, single semester carries 1 graduate credit. A standard graduate course meeting for two-and-a-half hours per week in a single semester of 15 weeks is equivalent to 3 credits. This format is the most common for graduate courses. Graduate laboratories meet three times per graduate credit (i.e., two-and-a-half-hours per week in a single semester of 15 weeks is equivalent to 1 credit). Courses meeting more or less than two-and-a-half hours each week are assigned credits in the correct proportion. The final examination period is an integral part of the 15-week semester.

Graduate Degrees and Advanced Certificates

Graduate Advanced Certificate Programs

NYU School of Engineering offers several graduate advanced certificate programs in specialized subject areas for students who do not wish to enroll in a full-degree program. Detailed descriptions of the certificate programs are available from the responsible departments.

Admission Requirements

Admission requirements for certificate programs are the same as those for related MS programs. Applicants must have a minimum undergraduate GPA of 3.0 or higher, and GREs are required from those applying for full-time study. Applicants must be admitted formally to a certificate program before beginning graduate course work.

Graduation Requirements

Depending on the program, 12 to 15 credits must be taken at NYU School of Engineering to earn a certificate, and no transfer credits for certificates are permitted. Courses taken for a certificate may be applied toward the future pursuit of an MS, ME, or PhD graduate degree, but not to another

certificate program. Students must have a cumulative GPA of 3.0 in all graduate courses taken at the NYU School of Engineering to receive a certificate.

Students in such a program who subsequently decide to pursue a graduate degree must file a separate application for admission to the respective graduate program.

Master of Science

Admission Requirements

Admission to Master of Science programs requires a bachelor's degree and at least four years of college-level courses in a preparatory discipline from an institution acceptable to the NYU School of Engineering. An undergraduate GPA of 3.0 or better is required for admission. GRE scores are recommended for all applicants, and are required for anyone applying for full-time study or seeking merit-based scholarships. Applicants seeking admission to the MS in Integrated Digital Media are exempt from the GRE requirement, and those seeking admission to technology management-related degrees are encouraged to submit GMAT scores instead of the GRE. Letters of Recommendation, a Statement of Purpose, and a professional resume are also required from all applicants seeking admission to any graduate program.

Graduation Requirements

Candidates for the degree of Master of Science must complete no fewer than 30 credits of graduate courses and research beyond the bachelor's degree in the program selected. Academic departments may require additional credits for individual degrees. Individual programs may specify required courses, minimum GPAs in specific courses or course groups, or require a comprehensive examination, presentation of a seminar, or completion of a project or thesis. Specific course requirements for each MS program are detailed in the programs section of this catalog. To obtain the MS degree, students must maintain a cumulative GPA of 3.0 (equivalent to a B letter grade) or better in all graduate work undertaken at the NYU School of Engineering and any other school of NYU, including courses not used to fulfill specific program requirements. The average of B or better includes all guided studies, readings, projects, theses and dissertations. Students may offer no more than a combined total of 9 credits of project, guided studies, readings, or thesis toward fulfillment of the MS degree requirements. Students taking project or thesis must register for at least 3 credits of project or thesis every semester until the work is completed and a grade recorded (also refer to the section Maintenance of Studies).

MS students may elect to complete an MS project or MS thesis and may be required to do so in certain programs. Consult the programs section in this catalog for details. A project usually entails 3 to 6 credits, while an MS thesis is generally a more extended piece of research, usually entailing 6 to 9 credits. At this level, research should exhibit a thorough understanding of advanced scientific thought and an ability to apply advanced principles constructively to engineering planning and design.

Manuscript Presentation

Degree candidates must present their research to the appointed guidance committee in final manuscript form for official acceptance no later than two weeks before the end of the semester. The accepted format for the bound research document is detailed in the "Regulations on Format,

Duplication and Publication of Project Reports, Theses and Dissertations.” Detailed information is available on the NYU School of Engineering website.

Graduate students registered for MS thesis credits must submit four final bound copies to their department for necessary signatures, and then present them to the Office of Graduate Academics one week before the end of the semester.

Master of Engineering

Admission Requirements

All regulations and requirements for the Master of Engineering degree, including those governing admissions, graduation, and residency, are identical to those for the Master of Science degree.

Graduation Requirements

Candidates for the degree Master of Engineering must complete no fewer than 30 credits of graduate courses (including a maximum of 9 credits of research) beyond the bachelor’s degree in the program. The Master of Engineering is for students seeking in-depth knowledge in fields requiring courses from multiple disciplines, especially those taught by several different academic departments. Students create their study program, including at least one graduate certificate, with the approval of a graduate adviser. A capstone experience is required for graduation.

Doctor of Philosophy

Admission Requirements

Students may apply to a doctoral program either directly after a bachelor’s degree or after completing a master’s degree. In either case, a GPA of 3.0 or better is required in all previous degree programs and a GPA of 3.5 or better is typically expected. GRE scores are required for all full-time PhD applicants. The admissions process for the doctoral program follows the same path as that of the Master of Science and Master of Engineering applications. Highly qualified candidates whose interests are incompatible with the faculty’s research interests may not be admitted. Additionally, most departments admit only the number of students that they can financially support, and qualified candidates may not be admitted due to limited availability of funding.

Graduation Requirements

All doctoral candidates must complete a minimum of 75 credits of graduate work beyond the bachelor’s degree, including a minimum of 21 credits of dissertation research (or more, depending on major). Requirements for the degree of Doctor of Philosophy are qualitative and quantitative. Students will find that the formal requirements of residence, course credits, and dissertation provide a framework within which they are free to construct individual programs for creative learning at an advanced level. Students must satisfy the detailed requirements of the selected degree program.

Each PhD student must complete a PhD dissertation. Research at this level must demonstrate critical and constructive thought, as well as the ability to use the techniques necessary to explore and develop new knowledge in mathematics, science, or engineering. A successful dissertation must demonstrably advance the subject area of research. School requirements for dissertations set a minimum of 21 credits of registration. All research should be characterized by accuracy of

observation and measurement, and by clarity and completeness in presentation. The conclusions presented must be supported by adequate studies and investigations, and supplemented by a complete bibliography.

Graduate students in a PhD program should confer with an adviser in the department of major interest regarding: 1) selection of courses; 2) major and minor fields of study; 3) formulation of a guidance committee; 4) qualifying and language examinations; 5) degree candidacy.

Students in a PhD program must take and pass doctoral qualifying examination(s) administered by their major department. These examinations are generally scheduled once or twice yearly, and students should consult their academic department for further information. Students are highly encouraged to take the examination(s) in their first year of the program, and they may not register for dissertation research until they have passed the examination(s). If students have not passed by the end of their second year, they may be disqualified from the PhD program. Within six months of passing the examination(s), students and their dissertation adviser must form a dissertation-guidance committee that will oversee course selection, provide research guidance, and ensure that satisfactory progress is being made toward completion of the dissertation in a timely manner. Course selection must ensure that requirements of major and minors set forth by the respective programs are met. The committee, at its discretion or bound by departmental regulations, may require students to present a dissertation research proposal. The committee is expected to meet at least once per semester to assess student progress, and doctoral students must defend their dissertation in front of this committee. Doctoral students must obtain a checklist of the milestones and requirements for the PhD program from the Office of Graduate Academics.

All doctoral students must maintain a GPA of 3.0 or better at all times and a B or better for the dissertation, and some departments have further specific course or grade requirements that must be fulfilled. Once students begin their dissertation research, they must register for at least 3 credits of dissertation every semester until the dissertation is completed and successfully defended (also refer to the section on Maintenance of Studies).

Manuscript Presentation

Degree candidates must present their research to the appointed guidance committee in final manuscript form for official acceptance no later than two weeks before the end of the semester. The accepted format for the bound research document is detailed in the "Regulations on Format, Duplication and Publication of Project Reports, Theses and Dissertations." Detailed information is available on the NYU School of Engineering website.

Graduate students registered for PhD dissertation credits must submit four final bound copies to their department for necessary signatures and then present them to the Office of Graduate Academics one week before the end of the semester.

Publication

Doctoral dissertations are published by UMI Dissertation Publishing (ProQuest). The cost of this service is charged to the student. Publishing with UMI ensures that the dissertation thesis gains the widest possible audience. Any interested person can purchase copies of a dissertation through the company's website.

The faculty regards publication of the major content of a doctoral dissertation in a recognized scientific journal as a necessary final step if the work performed is to achieve maximum usefulness. The publication must indicate, by footnote or otherwise, its basis as a New York University School of Engineering dissertation.

Graduate Credits and Requirements

Residency

To satisfy residency requirements for a graduate degree at the NYU School of Engineering, students must complete the following minimum number of credits at the School:

- Graduate Certificate: All credits (12-15, depending on certificate)
- Master of Science: Total number of credits required, less 9 (at least 21 credits of residency)
- Master of Engineering: Total number of credits required, less 9 (at least 21 credits of residency)
- Doctor of Philosophy: 27 credits (including all dissertation credits)

Transfer Credits

Applications for transfer credits must be submitted for consideration before the end of the first semester of matriculation. Courses with grades below B are not eligible for transfer. Transfer credits for courses taken after matriculation at the NYU School of Engineering are rarely accepted and must be approved by the student's academic department and by the Office of Graduate Academics before the course is taken. Grades for transferred credits or courses are not recorded and are not included in GPA calculations.

Certificates

No transfer credit is permitted for graduate certificates.

Master of Science and Master of Engineering

A maximum of 9 credits may be accepted as transfer credits towards an MS or ME degree. Transfer credits must be approved by the student's department, the Associate Dean for Graduate Academics, and the Office of the Registrar. Courses that have been counted towards an awarded undergraduate or graduate degree, whether taken at NYU or another institution, may not be transferred toward a master's degree at the NYU School of Engineering. Credits submitted for consideration must be: 1) from accredited institutions; 2) consistent with NYU School of Engineering's residency requirements; 3) completed with grades B or better; 4) consistent with the curriculum in which the student is registered; 5) taken after receipt of a bachelor's degree, with the exception of NYU School of Engineering's undergraduate students (See section: Transfer Policy Exceptions: NYU SOE Undergraduate Students). Theses, projects and guided studies or readings courses cannot be transferred.

Doctor of Philosophy

Doctoral students may transfer a blanket 30-credits from a prior MS degree. For the blanket 30-credit transfer, the prior MS need not be a 30-credit MS, so long as an MS degree (or equivalent) was granted, and a copy of the degree and detailed transcripts are presented. Additional courses,

taken after receipt of a bachelor's degree, but not counted towards an awarded degree may be eligible for transfer, up to a maximum of 18 credits. Additional courses individually transferred cannot include project, thesis, dissertation, guided studies or readings, or special topics credits. The total number of transferred credits for the PhD degree may not exceed 48. Some programs have additional restrictions; students should also consult the program specific portion of the bulletin for further information.

Transfer Policy Exceptions

NYU School of Engineering Undergraduate Students

While transfer policies normally preclude the transfer of graduate credit taken prior to the receipt of a bachelor's degree, an exception is made for NYU School of Engineering students who take graduate courses while pursuing an undergraduate degree at NYU School of Engineering. Such graduate courses may be applied subsequently to a graduate degree provided that students earned a B grade or better and that the individual courses were not used to fulfill requirements for the undergraduate degree at NYU School of Engineering. The sum of transfer credits from other institutions and internal transfer credits from an NYU School of Engineering undergraduate degree cannot exceed 9 credits.

NYU School of Engineering BS/MS Students

NYU School of Engineering students enrolled in a joint BS/MS program with a study plan pre-approved by an academic adviser may take graduate level courses prior to receiving their bachelor's degree, and may apply these courses towards the requirements of their MS program without credit restriction. Graduate courses used to satisfy undergraduate degree requirements, however, cannot be used to satisfy graduate degree requirements. BS/MS students must maintain a minimum 3.0 CGPA in all graduate level courses, or they risk being disqualified from the BS/MS program.

Period of Validity

Graduate courses reflect the current state of the art in their respective fields. Thus, all courses that are more than 10 years old at the beginning of graduate study at NYU School of Engineering, whether taken previously at the School or at another institution, are ineligible for transfer and will not count towards the satisfaction of degree requirements. The blanket 30-credit transfer of an MS degree taken at the NYU School of Engineering or elsewhere towards a PhD program is exempt from this period of validity and does not expire.

Graduate Validation Credits

When it is unclear whether a course taken outside the NYU School of Engineering is suitable for transfer credit, students may qualify for transfer credit for that course by passing a validation examination. Permission to take the examination must be recorded in advance on the student's transfer-evaluation form. The examination format is at the discretion of the department giving the course. Scheduling of the examination is by mutual agreement, but in no event can it be scheduled more than one calendar year after the student begins study at NYU School of Engineering. A grade of B or better is required for graduate students. An examination may not be taken more than once. A student who registers for or attends the course at NYU School of Engineering forfeits the right to take a validation examination.

The sum of validation credits and transfer credits is limited to 9 credits for the MS and ME degrees.

One exception to the paragraphs above regarding transfer credit and graduate validation credit: Mathematics graduate students (MS and PhD) will be permitted, with adviser approval, to exceed the 9-credit limit on transfer credits and validation units by taking specified, adviser-approved courses at the Courant Institute of NYU. In the case of MS students, such approval may not raise the number of such courses above four.

Maximum Time for Completion

Programs for graduate certificates must be completed within three years. The MS and ME degree programs must be completed within five years from the beginning of graduate studies at NYU School of Engineering. The PhD program must be completed in six years for full-time students and 12 years for part-time students from the time of admission to graduate studies at NYU School of Engineering (not from the beginning of PhD studies). All time limits include any approved Leaves of Absence.

Extensions of these time periods are rarely granted and require prior approval from the Associate Dean of Graduate Academics. Students must request an extension at least 60 days prior to the deadline for completion. If an extension is granted, not all courses taken previously may count towards the degree. The Associate Dean, consulting with the department, will prepare a plan for the student to follow to obtain the degree.

Graduate Registration Policies

All graduate students must be registered for a minimum of 1.5 credits each fall and spring semester until they graduate. However, if students begin an MS project or thesis, or a PhD dissertation, they must register for at least 3 credits of project, thesis, or dissertation every fall and spring semester until it has been completed and accepted. Thus, while students who have not previously enrolled in research credits may satisfy registration requirements and maintain their student status by registering for 1.5 credits, students who have begun a project, thesis, or dissertation in a previous semester and who have not yet completed must register for a minimum of 3 credits (of research) each fall and spring until complete. (Also refer to the section on Maintenance of Studies.)

Graduate Registration Status

Graduate students pay tuition at the per-credit rate. Full-time status is defined by the following:

- Full-time MS students must be registered for 9 credits or more each semester. Students who are normally full-time may register for fewer credits during their last semester by registering for only the number of credits necessary for graduation. During this last semester they are part-time, but can be treated as full-time-equivalent for immigration purposes only (not for the purpose of financial aid eligibility) by requesting full-time-equivalency status from the Office of Global Services.
- Full-time MS students in the lock-step, cohort-based, executive-format MS programs are registered for all courses specified by the program as published in the catalog each semester. These programs require distinct courses and/or projects, each bearing credits approved for the program.
- Prior to passing the qualifying exam, full-time PhD students must register for a minimum of 9 credits per term. Upon passing the qualifying exam, students may maintain full-time status

by registering for a minimum of 3 credits of dissertation per semester. Students who are not officially enrolled in a PhD program, irrespective of whether or not they have passed the qualifying exam, must continue to take a minimum of 9 credits per semester until they are formally admitted to a PhD program.

A status of non-matriculated or visiting student allows students to take up to three graduate courses at NYU School of Engineering (maximum of 2 courses or 6 credits per semester) without formally applying for admission to a graduate program. If these students desire to continue at NYU School of Engineering as matriculated students in a graduate degree or certificate program, they must follow the formal application process, and admission is not guaranteed.

Maintenance of Studies

MS Students: Under exceptional and well-documented circumstances, graduate students seeking an MS degree in a program that requires an MS thesis or MS project may, with the permission of the thesis or project adviser, request one semester of Maintenance of Studies to complete the project or thesis. For permission to be granted, students and their advisers must provide adequate written justification to the Office of Graduate Academics.

PhD Students: PhD students who have completed all required courses and dissertation credits, and who have completed all of their doctoral research, may register for up to two semesters of Maintenance of Studies with no tuition charge (School fees apply). Maintenance of Studies officially maintains the student's degree candidacy. Students who have not completed their doctoral research must continue to register for dissertation credits.

Modifications to Curricula

Curricula and courses change from time to time in order to keep students abreast of the latest knowledge and methods within subject areas. Students are required to satisfy the curriculum and degree requirements in effect at the time of their matriculation and must obtain current degree requirements from their program adviser.

In order to accommodate curriculum and course revisions, it is sometimes necessary to substitute a course for one specified in the curriculum. Students may also request course substitutions to tailor their studies to their interests. Both the program adviser and the Office of Graduate Academics must approve all course substitutions.

Graduate International Students

Full-time Status, Program and Degree Changes

To maintain non-immigrant student status, international students must maintain full-time status every fall and spring semester for the entire semester (i.e., withdrawing from a course during the semester may jeopardize full-time status). Students are not required to enroll during the summer semester and may enroll for credits at their discretion. International students may register for online courses, but must be registered for a minimum of 6 credits of on-ground course work per term. All questions concerning this regulation should be addressed with the Office of Global Services (OGS). Students

may take less than a full course of study if fewer credits are needed during the last semester prior to graduation, but they must notify OGS prior to the beginning of the semester and obtain full-time equivalency status. Students may qualify for a reduced course load (RCL) for valid academic and medical reasons. All exceptions must be approved by OGS before the last day of registration (the add/drop deadline) each semester so that courses can be added to the student's schedule if necessary. Only one semester of reduced course load (RCL) for academic reasons is permitted per degree level.

Students in F-1 and J-1 status must obtain written permission from OGS for any Leave of Absence request, or to withdraw from classes if the withdrawal results in less than a full course load. They also must obtain written permission and the pertinent I-20/DS-2019 form before enrolling in a new degree program. The process of withdrawing from a course, changing programs, changing degree level, or taking a Leave of Absence through the Office of the Registrar keeps a non-immigrant student in good standing only with the School, but not with the U.S. Citizenship and Immigration Services (USCIS), unless proper approval is obtained from OGS. Students planning on employment as part of their course work must obtain prior approval from OGS for any such employment.

Failure to comply with the immigration requirements for full-time status, course withdrawals, program changes, degree level changes, or Leave of Absence violates the non-immigrant student's status and renders a student ineligible for any benefit of that status. According to USCIS, lack of compliance may also result in deportation.

Policies on Grading and Grades

Computing the Grade-Point Average for Graduate Students

For the purposes of computing GPAs for graduate students and graduate courses, the following schedule is used.

Grade	Point Value	Description
A	4.0	Excellent
A-	3.7	Excellent
B+	3.3	Good
B	3.0	Good
B-	2.7	Good
C+	2.3	Deficient, but Passing
C	2.0	Deficient, but Passing

F	0.0	Failing
P		Pass (no GPA value)
S		Satisfactory
U		Unsatisfactory
W		Withdrawal
I		Incomplete, converts to F after 180 days
AUD		Audit

Grades S and U reflect progress on research efforts. Once the thesis or dissertation is completed, the letter grade is entered on the transcript for all research registrations. Noncredit seminar courses are graded P or F. Other than research credits, no credit-bearing courses can be assigned S or U grades. A student cannot graduate if a grade of U is on the transcript for any credit-bearing course or for research efforts at the time of graduation. A grade of I cannot be assigned to a course that is graded S or U. Grades S, U, I, W and AUD are not included in computing the GPA.

Graduate Bridge and Preparatory Courses

Many programs offer graduate bridge or preparatory courses to accommodate the needs of students who lack certain undergraduate preparation. Generally, bridge or preparatory courses cannot be used to satisfy degree requirements, particularly for degrees within the department that offers the course. However, these courses are included in the calculation of a student's graduate GPA. Some graduate students may be required to take certain undergraduate courses as preparation for advanced graduate study. Undergraduate courses are not included in the student's GPA calculation.

Repeating Courses

The first time a graduate student repeats a course, the lower grade is not counted towards the GPA. All subsequent grades in a course repeated more than once are included in the GPA, although degree credit is earned only once.

Course Withdrawal: The W Grade

Students may withdraw from a course or courses without academic penalty until the published withdrawal deadline of the normal fall or spring semester. Students should process their own withdrawals online via Student Self-Service during the first two weeks of the semester. After the first two weeks, students must complete a paper add/drop form and submit the form to the Office of Graduate Academics. In all cases, students are encouraged to consult with their academic advisers, as withdrawing from certain courses may delay their planned graduation date, and international students should make sure that they do not drop below full-time status (9 credits). Students who have been placed on final academic probation are not permitted to withdraw from courses without prior approval from the Office of Graduate Academics.

When the course duration varies from the norm, such as in six-, nine- or 12-week courses, please consult with the NYU Polytechnic SOE Records and Enrollment Office for deadline information. Withdrawn courses remain on the student's transcript with a grade of W and are not calculated into the GPA. Once entered on the student's record, a W cannot be changed to any other grade. An F grade is recorded for any student who ceases to attend a course without formally withdrawing by the required deadline.

International students who wish to withdraw from a course, or courses, must have prior approval from OGS if withdrawing will leave them with fewer than nine credits of registration.

Auditing Courses

Graduate students may audit courses instead of receiving credits and grades for them. Regular tuition is charged and courses are treated as part of a full-time load. An AUD notation is made on the student's permanent record.

Interested graduate students should see their advisers and must notify the NYU Polytechnic SOE Office of Records and Enrollment within the first two weeks of the semester if they select courses for audit status. Under no circumstances may an audit status be changed to credit status once elected. Audited courses do not count toward satisfying graduation requirements.

Incomplete Grades

If a student cannot complete the course work at the usual time because of valid reasons, such as illness or other critical emergency, the instructor may give a grade of Incomplete/I. In such cases, the instructor and the student must develop a detailed plan for completion that includes a specific completion date. Ordinarily this date should not extend beyond the intersession, in fairness to students who finish course requirements on time and to ensure that students complete prerequisites for advanced courses. An Incomplete grade converts to an F if the student fails to complete the work within the specified completion timeline, or at most by 180 days after the end of the semester in which the student was enrolled in the course. All Incomplete grades must be converted before graduation.

The grade of Incomplete/I is used sparingly and only in cases with valid reasons, not merely because students have planned poorly or overloaded themselves. An Incomplete grade should not be issued if a student is unable to complete the course requirements without attending or participating in the course a second time. If the student reregisters for a course in which an Incomplete grade was given, the Incomplete grade lapses to an F. If successful resolution of an Incomplete grade would require the repetition of any course or portion of a course, the instructor should not assign an Incomplete, and should instead counsel the student to withdraw from the course.

Change of Grade

Grades on file with the Registrar, with the exception of Incomplete/I grades and temporary grades (S or U), are considered final unless an error in calculating or recording the grade is discovered. No correctly reported final grade may be changed based upon re-taking an examination or completion of additional work. Incomplete/I grades are handled according to the policies described under Incomplete Grades. Temporary grades (S or U), used for continuing projects, thesis or dissertation,

will be converted to standard letter grades upon completion of the project, thesis or dissertation. Once recorded with the Registrar, these grades are treated as all other final grades. If an error in calculating or reporting a grade is discovered, the instructor will submit the change of grade request to the Department Chair. If approved by the Department Chair, the request will be submitted to the Associate Dean for Graduate Academics for consideration. Any incorrectly assigned grade must be corrected within one semester.

GPA Restart

If a student who has completed a master's degree at the School of Engineering wishes to pursue another master's degree(s), the student's GPA is re-started. In this way, the academic performance for each degree is accurately represented. A GPA cannot be restarted at the beginning of or during the PhD degree program. Any GPA restart is noted on the student's transcript.

Academic Standing and Probation

Graduate students are expected to progress in their studies and maintain a minimum 3.0 cumulative GPA at all times. Failure to do so results in the student being placed on academic probation. Graduate students are permitted a maximum of 2 semesters of probation, and these semesters need not be sequential in order to count towards the maximum limit.

Student academic progress is evaluated at the end of the spring and fall semesters (and at the end of the summer for summer admits only), irrespective of Incomplete or temporary (S/U) grades, and irrespective of whether students have dropped or withdrawn from any course(s). Any student whose GPA drops below 3.0 will be placed on probation and notified by the Office of Graduate Academics.

Students on probation must submit a signed Graduate Acknowledgement of Academic Probation and Potential Disqualification form to the Office of Graduate Academics before the start of the next semester. Students who are not yet registered for the following term will not be permitted to do so until the form is submitted to the Office of Graduate Academics. Students already registered will be de-registered from their courses if they do not submit the form. Further, any student who is on a second (final) semester of probation must obtain permission from the Office of Graduate Academics if they wish to make registration changes. The registration hold and the probation form serve to remind students on probation that they are not meeting required academic standards. No indication of academic probation appears on a student's transcript, but a record is kept on file. Academic disqualification, however, is noted on the student's transcript.

Students on final probation must have a cumulative GPA of 3.0 or above at the end of that semester, or the student will be disqualified from the School. Disqualified students will not be considered for readmission. If a student is disqualified, any grade of Incomplete, S, or U at the time of disqualification will remain as such on the student's transcript.

In addition to the academic probation process described above, a major department may request that a graduate student be placed on academic probation at any time. The request and its justification are signed by the Department Chair and sent to the Office of Graduate Academics for approval.

The probationary policies outlined above may differ from the policies governing conditionally admitted students; please refer to the Graduate Admission section on Conditional Admit status for more information, or address specific questions to the Office of Graduate Academics.

Leaves of Absence and Readmission

Leave of Absence

A student who wishes to temporarily suspend graduate studies may request a Leave of Absence. If a Leave of Absence is being requested for medical reasons, please consult with the Office of Student Affairs. A request for a Leave of Absence for any reason other than medical must be approved by the Office of Graduate Academics. If the leave is approved, the student's matriculated status is maintained, and the student may resume his or her studies after the Leave of Absence. The Registrar will record a Leave of Absence on the student's transcript.

Leaves of Absence, if approved, are granted for a maximum of one year except in extreme cases, such as compulsory national service (if such service is for more than one year). International students must also receive approval for the leave from OGS, as an approved Leave of Absence is an academic decision and does not override OGS concerns. The Leave of Absence does not extend the time limits for earning a degree (see section on Maximum Time to Completion). The approval of a Leave of Absence does not preclude subsequent academic disqualification.

In most circumstances, non-medical Leaves of Absence are only approved for students in good academic standing with NYU Polytechnic SOE.

Readmission

Students who do not maintain continuous registration and who are not on an approved Leave of Absence must apply to NYU for readmission if they wish to continue their graduate studies. Re-admitted students must pay accrued fees for the lapsed semester(s). If readmitted, their subsequent program attendance will be guided by the terms and conditions of the readmission and by the Bulletin and rules in effect at the time of readmission. Lapsed semesters do not extend the maximum time permitted to complete the degree. If students who re-apply cannot complete their studies within the allotted time permitted from the date of their initial admission to NYU School of Engineering, they can be re-admitted as a new student, but prior courses will be treated as part of the total transfer credits permitted (see section on Transfer Credits).

Leave of Absence and Readmission for Veterans

Students in graduate programs taking a Leave of Absence to perform military services are reinstated into the same degree program with the same academic status that they had when last in attendance at the institution. The length of absence from the institution cannot exceed five academic years unless the student requests and receives an exception from the Office of Graduate Academics. Such requests when approved by the Office of Graduate Academics constitute assurance of reinstatement to the degree program from which the leave was taken. If the period of absence exceeds the approved leave, students must apply for readmission.

Withdrawal from the University

Voluntary Withdrawal

Graduate students who wish to withdraw completely from NYU Polytechnic SOE (as opposed to a term withdrawal) must first withdraw from all courses in which they are currently registered, and then they must complete the online total withdrawal form. To receive *W* grades for the semester, the withdrawal must be completed by the withdrawal deadline indicated in the academic calendar. The mere absence from courses does not constitute official withdrawal, but results in *F* grades recorded for courses not completed. No complete withdrawal is official unless and until this form is completed and submitted to the NYU Polytechnic SOE Office of Records and Enrollment and approved by all required signatories. Students who submit an online total withdrawal request which is approved must reapply to NYU Polytechnic SOE should they wish to resume their studies in the future, and readmission is not guaranteed.

Involuntary Withdrawal

NYU Polytechnic School of Engineering is concerned about the health, safety and well-being of its students. Students judged to be a threat to themselves or to others may be withdrawn involuntarily from the School. The School seeks, whenever possible, for such students to be allowed to continue as active students if they agree to undergo professional care. Full details concerning this policy are available from the Office of Student Affairs.

Application Process for the Award of Master of Science and Doctor of Philosophy Degrees

Graduate students must file a formal application via Albert Student Center for the award of any NYU School of Engineering degree or certificate. Filing dates for each semester are published by the University Registrar. Students who do not file by the published deadline dates become candidates for the next conferral period.

Degrees are conferred and diplomas issued three times per year, typically in January, May, and September. All work for the degree must be completed and submitted before the graduation date.

NYU policy prohibits the awarding of a degree to members of the School teaching staff who hold a rank above the grade of Instructor.

Please note that a degree is not awarded unless the student applies for graduation, even if all requirements have been met. The date of the degree follows the application date for its award, not when all requirements are completed. If the application is filed more than two years after completion of degree requirements, the approval process is not automatic, and additional administrative actions may be required on a case-by-case basis.

Diplomas

Diplomas are mailed to the student about eight weeks after the degree conferral date. Diplomas are issued only once, subject to rare exceptions made on a case-by-case basis. Replacement diploma procedures and fees are published on the University Registrar's website. Replacement diplomas for

the School of Engineering will be printed with the school name at the time of the student's graduation.

Continuation of Studies Beyond the Initial Certificate or Master of Science

Students planning to pursue additional studies immediately following the award of an advanced degree by NYU School of Engineering should complete a new application for admission and submit it to the Graduate Admissions Office for review and approval by the department in which the new degree will be pursued. Examples are: 1) progressing from a certificate program to an MS program; 2) progressing from an MS program to a PhD program; 3) seeking a second MS degree from NYU School of Engineering. For rules governing the application of prior NYU School of Engineering credits towards a new degree program, please refer to the section on Transfer Credits and Transfer Policy Exceptions.

ACADEMIC DEPARTMENT, DEGREE AND PROGRAM INFORMATION

Learn about NYU Tandon School of Engineering's academic departments and their missions and explore departmental offerings.

Department of Applied Physics

[Go to information for Department of Applied Physics.](#)

Non-Degree

- [Applied Physics Minor](#)
- [Nuclear Sciences and Engineering Concentration](#)
- [Nuclear Sciences and Engineering Minor](#)

Bachelor of Science

- [Applied Physics, B.S.](#)
- [Physics and Mathematics, B.S.](#)

Master of Science

- [Applied Physics, M.S.](#)

Department of Chemical and Biomolecular Engineering

[Go to information for Department of Chemical and Biomolecular Engineering.](#)

Non-Degree

- [Biomolecular Science Minor](#)

Bachelor of Science

- [Biomolecular Science, Biomedical Science Option, B.S.](#)
- [Biomolecular Science, Biotechnology Option, B.S.](#)
- [Biomolecular Science, Chemistry Option, B.S.](#)
- [Chemical and Biomolecular Engineering, B.S.](#)

Master of Science

- [Biomedical Engineering, Bioinstrumentation Track, M.S.](#)
- [Biomedical Engineering, Biomaterials Track, M.S.](#)
- [Biomedical Engineering, Medical Imaging Track, M.S.](#)
- [Biotechnology and Entrepreneurship, M.S.](#)
- [Biotechnology, M.S.](#)
- [Chemical Engineering, Guided Studies Option, M.S.](#)
- [Chemical Engineering, Thesis Option, M.S.](#)
- [Chemistry, M.S.](#)
- [Translational Surface Engineering, M.S.](#)

Doctor of Philosophy

- [Biomedical Engineering, Ph.D.](#)
- [Chemical Engineering, Ph.D.](#)
- [Materials Chemistry, Ph.D.](#)

Department of Civil and Urban Engineering

[Go to information for Department of Civil and Urban Engineering.](#)

Non-Degree

- [Construction Management Minor](#)

Bachelor of Science

- [Civil Engineering, B.S.](#)
- [Construction Management, B.S.](#)

Graduate Certificate

- [Construction Management Advanced Certificate](#)
- [Executive Construction Management \(Exec 21\) Advanced Certificate](#)
- [Traffic Engineering Advanced Certificate](#)
- [Transportation Management Advanced Certificate](#)
- [Transportation Planning Advanced Certificate](#)

Master of Science

- [Civil Engineering, M.S.](#)
- [Construction Management, M.S.](#)
- [Environmental Engineering, M.S.](#)
- [Environmental Science, M.S.](#)
- [Transportation Management, M.S.](#)
- [Transportation Planning and Engineering, M.S.](#)
- [Urban Infrastructure Systems, M.S.](#)

Doctor of Philosophy

- [Civil Engineering, Ph.D.](#)
- [Transportation Planning and Engineering, Ph.D.](#)

Department of Computer Science and Engineering

[Go to information for Department of Computer Science and Engineering.](#)

Non-Degree

- [Computer Science Minor](#)
- [Cybersecurity Minor](#)
- [Game Engineering Minor](#)

Bachelor of Science

- [Computer Science and Computer Engineering \(dual major\), B.S.](#)
- [Computer Science, B.S.](#)

Master of Science

- [Computer Science, M.S.](#)
- [Cybersecurity, M.S.](#)

Doctor of Philosophy

- [Computer Science, Ph.D.](#)

Department of Electrical and Computer Engineering

[Go to information for Department of Electrical and Computer Engineering.](#)

Non-Degree

- [Computer Engineering Minor](#)
- [Electrical Engineering Minor](#)

Bachelor of Science

- [Computer Engineering, B.S.](#)
- [Electrical Engineering and Computer Engineering \(dual major\), B.S.](#)
- [Electrical Engineering, B.S.](#)

Master of Science

- [Computer Engineering, M.S.](#)
- [Electrical Engineering, M.S.](#)

Doctor of Philosophy

- [Electrical Engineering, Ph.D.](#)

Department of Finance and Risk Engineering

[Go to information for Department of Finance and Risk Engineering.](#)

Non-Degree

- [Finance Minor](#)

Master of Science

- [Financial Engineering, Computational Finance Track, M.S.](#)
- [Financial Engineering, Financial Markets and Corporate Finance Track, M.S.](#)
- [Financial Engineering, M.S.](#)
- [Financial Engineering, Risk Track, M.S.](#)
- [Financial Engineering, Technology and Algorithmic Finance Track, M.S.](#)

Department of Mathematics

[Go to information for Department of Mathematics.](#)

Non-Degree

- [Mathematics Minor](#)

Bachelor of Science

- [Mathematics, B.S.](#)

Master of Science

- [Mathematics, Examination Option and Designated Subspecialty Option, M.S.](#)
- [Mathematics, Examination Option, M.S.](#)
- [Mathematics, Thesis Option, M.S.](#)

Doctor of Philosophy

- [Mathematics, Ph.D.](#)

Department of Mechanical and Aerospace Engineering

[Go to information for Department of Mechanical and Aerospace Engineering.](#)

Non-Degree

- [Aerospace Engineering Minor](#)
- [Mechanical Engineering Minor](#)
- [Nuclear Sciences and Engineering Interdisciplinary Minor](#)

Bachelor of Science

- [Mechanical Engineering, Aerospace Minor, B.S.](#)
- [Mechanical Engineering, B.S.](#)

Master of Science

- [Mechanical Engineering, Controls and Dynamic Systems Specialty, M.S.](#)
- [Mechanical Engineering, Energy Engineering and Policy, M.S.](#)
- [Mechanical Engineering, Mechanics and Structural Systems Specialty, M.S.](#)
- [Mechatronics and Robotics, M.S.](#)

Doctor of Philosophy

- [Mechanical Engineering, Ph.D.](#)

Department of Technology, Culture and Society

[Go to information for Department of Technology, Culture and Society.](#)

Non-Degree

- [Integrated Digital Media Minor](#)
- [Science and Technology Studies Minor](#)
- [Sustainable Urban Environments Minor](#)

Bachelor of Science

- [Integrated Digital Media, B.S.](#)
- [Science and Technology Studies, B.S.](#)
- [Sustainable Urban Environments, B.S.](#)

Master of Science

- [Integrated Digital Media, M.S.](#)

Department of Technology Management and Innovation

[Go to information for Department of Technology Management and Innovation.](#)

Non-Degree

- [Management Minor](#)

Bachelor of Science

- [Business and Technology Management, B.S.](#)

Master of Science

- [Industrial Engineering, M.S.](#)
- [Management \(MSM\), Construction Management Concentration, M.S.](#)
- [Management \(MSM\), Design Innovation Concentration, M.S.](#)
- [Management \(MSM\), Electronic Business Concentration, M.S.](#)
- [Management \(MSM\), Entrepreneurship Concentration, M.S.](#)
- [Management \(MSM\), Human Resource Management Concentration, M.S.](#)
- [Management \(MSM\), Industrial and Manufacturing Engineering Concentration, M.S.](#)
- [Management \(MSM\), Information Management and Telecommunications Management Concentration, M.S.](#)
- [Management \(MSM\), M.S.](#)
- [Management \(MSM\), Project Management Concentration, M.S.](#)
- [Management \(MSM\), Technology Management Concentration, M.S.](#)
- [Management of Technology, M.S.](#)
- [Manufacturing Engineering, M.S.](#)
- [Organizational Behavior, Systems and Analytics, Human Capital Engineering & Analytics Concentration, M.S.](#)
- [Organizational Behavior, Systems and Analytics, Human Resource Information Systems Concentration, M.S.](#)
- [Organizational Behavior, Systems and Analytics, Human Resources Management Concentration, M.S.](#)

- [Organizational Behavior, Systems and Analytics, Management of Change Concentration, M.S.](#)
- [Organizational Behavior, Systems and Analytics, Training and Development Concentration, M.S.](#)

Doctor of Philosophy

- [Technology Management, Ph.D.](#)

Interdisciplinary

Non-Degree

- [Bioinformatics Advanced Certificate](#)

Master of Science

- [Bioinformatics, M.S.](#)

Enterprise Learning

[Go to information for Enterprise Learning.](#)

NYU Tandon Online

[Go to information for NYU Tandon Online.](#)

Graduate Certificate

- [Bioinformatics \(Online\) Advanced Certificate](#)
- [Project Management \(Online\) Advanced Certificate](#)

Master of Science

- [Bioinformatics \(Online\), M.S.](#)
- [Computer Engineering \(Online\), M.S.](#)
- [Cybersecurity \(Online\), M.S.](#)
- [Electrical Engineering \(Online\), M.S.](#)
- [Industrial Engineering \(Online\), M.S.](#)
- [Management of Technology \(Online\)](#)

General Engineering

[Go to information for General Engineering.](#)

DEPARTMENT OF APPLIED PHYSICS

Chair: Lorcan M. Folan

Mission Statement

The NYU Tandon School of Engineering Department of Applied Physics is committed to providing high-quality introductory-, intermediate- and advanced-level physics courses as services to the School's engineering and science departments. The major programs train new generations of physicists who apply the tools of physics to contemporary problems to benefit all. The department, collaborating closely with other departments, employs physics knowledge and techniques to enable engineering research and education, and serve as a catalyst for research in other scientific fields.

Physics: The Fundamental Science

Physics is the science devoted to the study and understanding of nature. It traces its history back to Aristotle and derives its name from the Greek words for nature and natural. Physics is often said to be the most fundamental science which deals with the constituents, properties and evolution of the entire universe, on all length and time scales. Applied Physics is the branch of physics where the implications and uses of fundamental physics knowledge are explored and exploited.

Contact Information

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Fax: (646) 997-3139

E-mail: appliedphysics@nyu.edu

Web: <http://engineering.nyu.edu/academics/departments/physics>

Degrees Offered

The department offers [Applied Physics, B.S.](#) and [Applied Physics, M.S.](#) degrees, and a [dual major degree in Mathematics and Physics](#), administered in cooperation with the Department of Mathematics. Students may elect to take a [minor in Applied Physics](#) or elect a [Nuclear Sciences and Engineering Concentration](#) or a [Nuclear Sciences and Engineering Minor](#), administered in cooperation with the Department of Mechanical Engineering. Read more about the [Applied Physics Program](#).

Faculty

Professors

Stephen Arnold, University and Thomas Potts Professor

PhD, City University of New York

Microparticle Photophysics, Whispering Gallery Mode Biosensing, Organic Molecular Crystals

Kurt H. Becker, Professor Dr. rer. net., Universität des Saarlandes, Saarbrücken, Germany
Atomic, Molecular, and Chemical Physics; Plasma Physics; Development of New Experimental Techniques and Processes

Edward L. Wolf, Professor
PhD, Cornell University
Experimental condensed matter physics superconductivity; nanophysics and nanotechnology; electron tunneling spectroscopy

Associate Professor

Lorcan M. Folan, Associate Professor, Department Chair
PhD, Polytechnic University
Spectroscopic characterization of aerosol particles; optical properties of micro-cavities; energy transfer in condensed matter; electron capture beta decay

Industry Professors

Victor Y. Barinov, Industry Associate Professor
PhD, Academy of Science of the Ukraine

Valery A. Sheverev, Industry Professor, Director of Physics Laboratory Program
PhD, Leningrad State University

Vladimir I. Tsifrinovich, Industry Associate Professor
DSc, Kirensky Institute of Physics, Academy of Science, USSR

Lecturers

S. John DiBartolo, Senior Lecturer
PhD, University of Virginia

David T. Mugglin, Senior Lecturer
PhD, Lehigh University

Vladimir Ostrovsky, Senior Lecturer
DSc, Kiev Institute of Physics, Academy of Science, USSR

Adjunct Faculty

Partha P. Debroy, Adjunct Professor
Ph.D. Carnegie Mellon University

Olga Dulub, Adjunct Professor
PhD, Tulane University

Peter M. Fried, Adjunct Professor
Ph.D. University of Wisconsin, Madison

Suryanarayan G. Hegde, Adjunct Professor
Ph.D. Stevens Institute of Technology

Akhil Lal, Adjunct Professor
PhD, Polytechnic University

Lyudmila Malikova, Adjunct Professor
PhD, State University Kishinev, Moldova

Benjamin Nachumi, Adjunct Professor
PhD, Columbia University

Vladimir Petricevic, Adjunct Professor
PhD, City University of New York

Alexander Raspopin, Adjunct Professor
Ph.D. Stevens Institute of Technology

Siyka I Shopova, Adjunct Professor
PhD, Oklahoma State University

Emeritus Faculty

Deo C. Choudhury, Professor Emeritus
PhD, University of California

Hellmut J. Juretschke, Professor Emeritus
PhD, Harvard University

DEPARTMENT OF CHEMICAL AND BIOMOLECULAR ENGINEERING

Head: David Pine

Programs offered:

- [Biomedical Engineering](#)
- [Biomolecular Science](#)
- [Biotechnology](#)
- [Biotechnology and Entrepreneurship](#)
- [Chemical and Biomolecular Engineering](#)
- [Chemical Engineering](#)
- [Chemistry](#)
- [Materials Chemistry](#)
- [Translational Surface Engineering](#)

Faculty

Professors

Stephen Arnold, University and Thomas Potts Professor of Physics
PhD, City University of New York

Optics, biophotonics, microparticle photophysics (www.mp31.org), physical virology, organic solid-state physics

Mary K. Cowman, Professor of Biochemistry
PhD, Case Western Reserve University

Biophysical chemistry of macromolecules in solution, on surfaces and in crowded environments, Structure, biological function and medical applications of the polysaccharide hyaluronan, Development of improved biomedical materials, Atomic force microscopy methods for the imaging and physical characterization of single biological macromolecules and nanoparticles, Macromolecular crowding in polymer solutions

Bruce A. Garetz, Professor of Physical Chemistry
PhD, Massachusetts Institute of Technology

Laser spectroscopy, laser light scattering, non-linear optics, laser-induced nucleation and multiphoton processes

Mark M. Green, Professor of Organic Chemistry
PhD, Princeton University

Stereochemistry of synthetic and biologically interesting polymers and liquid crystals, Discovering the principles of organic chemistry by studying the complex industrial and biological phenomena arising from these principles as a new learning method

Rastislav Levicky, Professor of Chemical Engineering
PhD, University of Minnesota

Biological polyelectrolytes, biosensors and bio-diagnostics

John T. McDevitt, Department of Biomaterials and Biomimetics Chair for NYUCD
PhD, Stanford University
Microdevice, biomaterials

Jovan Mijovic, Professor of Chemical Engineering
PhD, University of Wisconsin at Madison
Relaxation dynamics in synthetic and biological complex systems, modeling of processing of polymers

David Pine, Silver Professor and Department Chair
PhD, Cornell University
Soft condensed matter physics, mesoscopic materials

Iwao Teraoka, Professor of Polymer Chemistry
PhD, University of Tokyo (Japan)
Photonic molecular sensors, whispering gallery modes

Abraham Ulman, Professor of Chemistry
PhD, The Weizmann Institute (Israel)
Self-assembled monolayers, surface engineering and nanotechnology

Associate Professors

Jin Ryoun Kim, Associate Professor of Chemical Engineering
PhD, University of Wisconsin at Madison
Protein engineering, structure and properties of proteins

Jin Kim Montclare, Associate Professor of Chemical and Biomolecular Engineering
PhD, Yale University
Molecular design, protein engineering, biomaterials and biocatalysis (montclare.poly.edu)

Assistant Professors

Ryan L. Hartman, Assistant Professor
PhD, University of Michigan
Catalysis and reaction engineering, continuous-flow manufacturing, flow chemistry, microchemical systems, and molecular management

Industry Professors

Gene R. Diresta, Industry Professor of Bioengineering
PhD, Polytechnic Institute of New York
Orthopaedic biomechanics, transport phenomena of solid tumors, mathematical modeling of physiologic systems

Evgeny Vulfson, Industry Professor of Biotechnology
PhD, Moscow State University
Biotechnology product and process development

Industry Associate Professors

Victor Barinov, Industry Associate Professor of Physics
PhD, Academy of Science of the Ukraine
Electroactive gels, mechanics of polymer networks, interface separation

Industry Assistant Professors

Qing Song, Industry Assistant Professor of Chemical and Biomolecular Engineering
PhD, City University of New York
Single-cell immunology, cell-cell heterogeneity, quantitative and multiplexed live single cell microarrays, molecular and immune regulatory mechanisms of biological process, non-invasive diagnostic strategies for human disease

Lecturers

Janice Abner, Senior Lecturer of Chemistry
PhD, Polytechnic University

Tommy S. Lee, Senior Lecturer of Biology
MPhil, New York University

Charles P. Martucci, Senior Lecturer of Chemistry
PhD, Columbia University

Myron I. Pollack, Senior Lecturer of Chemistry
PhD, New York University

Research Faculty

Kalle Levon, Research Professor
PhD, University of Tokyo
Phase separation in polymer blends and solutions, gelation, conductive polymers

Yoshiyuki Okamoto, Research Professor and Director of the Polymer Research Institute
PhD, Purdue University
Organic and polymer synthesis characterization and applications

Leonard Stiel, Research Professor of Chemical Engineering
PhD, Northwestern University

Edward D. Weil, Research Professor in Polymer Research Institute
PhD, University of Illinois
Additives for polymers, flammability

Faculty Emeriti

Robert F. Benenati, Professor Emeritus of Chemical Engineering
PhD, Polytechnic Institute of Brooklyn

Ernest Loebel, Professor Emeritus of Polymer Chemistry
PhD, Columbia University

Herbert Morawetz, University Professor Emeritus of Polymer Chemistry
PhD, Polytechnic Institute of Brooklyn

Nancy M. Tooney, Associate Professor Emerita of Biochemistry
PhD, Brandeis University

DEPARTMENT OF CIVIL AND URBAN ENGINEERING

Head: Maged G. Iskander

Mission Statement

The mission of the Department of Civil and Urban Engineering is to produce graduates capable of contributing to and advancing the practice of civil engineering and its sub-disciplines.

The Department

The Department of Civil and Urban Engineering mission involves its faculty in a wide variety of state-of-the-art research and in the development of innovative curricula for the civil engineers of the 21st century.

Research is focused on developing and implementing intelligent infrastructure-monitoring technologies, including smart materials, and optimizing infrastructure system planning, design, operation and management. Sustainability is a critical objective function and overarching theme.

Through the department's involvement in local, regional and national issues, students are exposed to a daily laboratory of infrastructure issues and projects all around them. The department participates in four major interdisciplinary research centers: The Urban Infrastructure Institute, the Urban Utilities Institute, the Transportation Research Institute and the Urban Security Initiative. Department research covers a broad range of topics, including highway capacity and level of service, remote monitoring of infrastructure elements and use, management of urban utilities, intelligent transportation systems technologies, construction materials properties and monitoring, urban infrastructure security and construction operations.

Faculty members teach undergraduate and graduate courses. The curriculum exposes students to instructors in the forefront of their fields; men and women who frequently work on projects and topics of current interest, often within the region. The full-time faculty is augmented by excellent adjunct faculty who teach specialty courses in areas of their expertise, bringing a strong practical element to the classroom.

Programs are well-rounded and balanced. They combine all necessary theoretical elements with a strong emphasis on design and application. Graduates are well-versed in state-of-the-art techniques and develop the skills needed to become leaders in the profession. Among these skills are the ability to communicate effectively in oral and written form and the ability to understand the context of civil engineering projects in a complex society.

Contact Information

Polytechnic School of Engineering

Six MetroTech Center

Brooklyn, NY 11201

Tel: (718) 260-3220

Fax: (718) 260-3433

E-mail: cue@poly.edu

Web: <http://engineering.nyu.edu/academics/departments/civil>

Civil Engineering Profession

Civil engineers are responsible for planning, designing, constructing, maintaining and operating today's infrastructure. These areas cover a wide range of urban and regional systems and functions, including buildings, roads, bridges, airports, rail systems, dams, irrigation systems, water supply systems, environmental ecosystems and solid- and liquid-waste treatment and disposal systems and processes. The civil engineer practices in a broad and exciting field with a major impact on society in general and on its infrastructure environment in particular.

Modern civil engineering also deals with rapidly expanding information technologies. These technologies monitor, control, operate and manage complex infrastructure systems. From smart buildings to remote monitoring of transportation, water supply, sewage and other infrastructures, the modern civil engineer applies information technologies to improve the quality of the infrastructure environment.

Degree Programs

The department's undergraduate programs deliver a broad civil-engineering background to the engineer beginning a professional career. Graduate programs allow students to specialize in particular areas or sub-disciplines and to pursue general graduate work across several different areas. The department offers the following degree and certificate programs:

Bachelor of Science

- [Civil Engineering, B.S.](#) offered by the [Civil Engineering Program](#)
- [Construction Management, B.S.](#) offered by the [Construction Management Program](#)

Master of Science

- [Civil Engineering, M.S.](#) offered by the [Civil Engineering Program](#)
- [Construction Management, M.S.](#) offered by the [Construction Management Program](#)
- [Environmental Engineering, M.S.](#) offered by the [Environmental Engineering and Science Program](#)
- [Environmental Science, M.S.](#) offered by the [Environmental Engineering and Science Program](#)
- [Transportation Management, M.S.](#) offered by the [Transportation Program](#)
- [Transportation Planning and Engineering, M.S.](#) offered by the [Transportation Program](#)
- [Urban Infrastructure Systems, M.S.](#) offered by the [Urban Infrastructure Systems Program](#)

Doctor of Philosophy

- [Civil Engineering, Ph.D.](#) offered by the [Civil Engineering Program](#)
- [Transportation Planning and Engineering, Ph.D.](#) offered by the [Transportation Program](#)

Advanced Certificates

- [Construction Management Advanced Certificate*](#)
- [Executive Construction Management \(Exec 21\) Advanced Certificate](#)
- [Traffic Engineering Advanced Certificate](#)
- [Transportation Management Advanced Certificate](#)
- [Transportation Planning Advanced Certificate](#)

**Offered in conjunction with the Department of Management*

Undergraduate Minor

- [Construction Management Minor](#)

Faculty

Professors

John C. Falcocchio, PE, Professor of Transportation Planning and Engineering, Executive Director of the Urban Intelligent Transportation Systems Center

PhD, Polytechnic Institute of Brooklyn

Travel demand forecasting, transportation system evaluation, planning and management

Fletcher H. (Bud) Griffis, F.ASCE, PE, Professor of Civil Engineering, Construction Management Program Director, Director of Center for Construction Management Technology

PhD, Oklahoma State University

Building Information Modeling (BIM), model-based simulation, applications of operations research principles to construction, magnetic levitation (Maglev) transportation systems, dredging and dredged material disposal, infrastructure design, construction and management, engineering economics

Magued G. Iskander, F.ASCE, PE, Department Head and Professor of Civil Engineering

PhD, University of Texas at Austin

Foundation engineering, modeling soil structure interaction and flow using transparent soils, long term behavior of sustainable piling made of recycled polymers, marine geotechnology, pile foundations, alternative foundations, geotechnical instrumentation and monitoring

Ilan Juran, Professor of Civil Engineering, Executive Director of Urban Infrastructure Institute, Director of the Urban Utilities Center

PhD, DSc, University of Paris IV, École Nationale de Ponts et Chaussées (France)

Geotechnical engineering, soil improvement technologies, geosynthesis engineering, in-situ soil testing, urban systems engineering and management

Kaan Ozbey, Professor

PhD, Virginia Polytechnic Institute and State University

Transportation modeling for safety and emergency management operations, real-time traffic control, ITS technology, transportation network organization

Roger P. Roess, Professor of Transportation Engineering

PhD, Polytechnic Institute of Brooklyn

Highway capacity and level-of-service analysis, traffic control and operations, public transportation operations, transportation economics, engineering pedagogy

Industry Professors

Lawrence Chiarelli, F.ASCE, PE, Esq., Industry Professor of Construction Management, Director of Construction Management Program, Associate Director of the Center for Construction Management Technology

JD, Brooklyn Law School

MEng, The Cooper Union

Construction law, risk management, program and construction management; structural engineering and cost estimating

Weihua Jin, Industry Professor

PhD, Columbia University

Sustainable cement-based materials, multi-scale materials mechanics, structural and earthquake engineering

Anne Dudek Ronan, PE, Industry Professor of Civil Engineering

PhD, Stanford University

Water resources engineering, groundwater flow and transport modeling, numerical modeling uncertainty, climate adaptation

Associate Professors

Masoud Ghandehari, Associate Professor of Civil Engineering

PhD, Northwestern University

Mechanics of fracture, durability of concrete structures, structural materials

Elena S. Prassas, Associate Professor of Transportation Engineering, Director of Transportation Programs

PhD, Polytechnic University

Traffic engineering, software systems and simulation for transportation applications, transportation economics, AI application

Industry Associate Professors

Mohsen Hossein, Industry Associate Professor of Civil Engineering, Coordinator of Graduate Programs in Civil Engineering

PhD, McGill University

Geotechnical engineering, environmental geotechnology, environmental impact assessment

José M. Ulerio, Industry Associate Professor of Transportation Engineering

MS, Polytechnic University

Transportation and traffic engineering; collection, handling and analysis of large-scale transportation data bases; highway capacity and quality of service analysis; travel demand forecasting; geometric design of highways

Research Faculty

Stephan Bless, Research Professor

ScD, Massachusetts Institute of Technology

Granular mechanics, soil structure interaction, ballistics

Mohammad Karamouz, F.ASCE, PE, Research Professor of Environmental Engineering
PhD, Purdue University
Environmental system management, surface and ground water hydrology, decision support systems (DSS), disaster management and urban water systems

Lecturer

Roula Maloof, Lecturer of Civil Engineering
PhD, Polytechnic Institute of New York
Non-destructive evaluation, fracture mechanics, finite element analysis, stress analysis

Adjunct Lecturers

Construction Management and Engineering

Peter Amato, Adjunct Lecturer of Civil Engineering
MS, John Jay College
President, Site Safety, LLC

Ralph D. Amicucci, CCIM, CPM, Adjunct Lecturer of Civil Engineering
MS, New York University
MBA, Iona College

Pooyan Aslani, Adjunct Lecturer of Civil Engineering
PhD, Polytechnic University
Resource-constrained scheduling, building information modeling (BIM), risk analysis

Andrew J. Bates, Adjunct Lecturer for Construction Management, USAF Ret.
PhD, Polytechnic Institute of NYU
Strategic planning and construction operations, risk analysis, statics

Anthony F. Caletka, PE, CCM, CFCC, Adjunct Lecturer of Civil Engineering
BS, Syracuse University
Managing Director, Capital Projects & Infrastructure, PricewaterhouseCoopers

John F. Caruso, Adjunct Lecturer of Civil Engineering
BS, City College of New York
Principal, John F. Caruso Consultant

Salvatore Castelli, Adjunct Lecturer of Civil Engineering
MS, Manhattan College
Project Manager, G.S. Engineering, P.C.

March W. Chadwick, AIA, LEED AP
M.Arch., Georgia Institute of Technology
Principal, M.Arch Architects

Omar Elsherief, PE
PhD, Polytechnic University
President, Structuretech Engineering

Dominick J. Fickeria, Adjunct Lecturer of Civil Engineering
MS, Manhattan College
Vice President, Director of Construction Management, URS Corp.

Robert N. Harvey, PE, Adjunct Lecturer of Civil Engineering
MS, Massachusetts Institute of Technology
Executive Director, Lower Manhattan Construction Command Center

Omar Khair-Eldin, PE
CE, Columbia University
Senior Supervising Engineer, Parsons PTG Engineers

Robert Maffia, PE, Adjunct Lecturer of Civil Engineering
MBA, Columbia University
Senior Director, Construction Management, Real Estate Development and Facilities, NYU Langone Medical Center

Michael P. Meehan, Adjunct Lecturer of Civil Engineering
MS, New York Institute of Technology
Consolidated Edison Company of New York (Ret.)

Lewis Mintzer, Adjunct Lecturer of Civil Engineering
MBA, Pace University
Director of Marketing, URS Corp.

Robert Otruba, PE, Adjunct Lecturer of Civil Engineering
BS, Syracuse University
University Director, Forensic and Litigation Consulting, FTI

Ronald J. Pennella, Adjunct Lecturer of Civil Engineering
MS, Polytechnic University
Project Executive, StructureTone Inc.

Patrick Pranci, PE, Adjunct Lecturer of Civil Engineering
PhD, City University of New York
Project Manager, El Sol Contracting and Construction Corp.

Salvador Rozenberg, RPA, Adjunct Lecturer of Civil Engineering
EMBA, University of New Haven
Principal, Transaction Maintenance Company

Joel Sciascia, Esq., Adjunct Lecturer of Civil Engineering,
JD, Fordham Law School
MS, Arizona State University, Del Webb
School of Construction General Counsel, Pavarini McGovern LLC

Jeffrey S. Seigel, Esq., Adjunct Lecturer of Civil Engineering
JD, Pace University School of Law
Director Business Development and Marketing, Pavarini/StructureTone

Jerome White, PE, Adjunct Professor of Civil Engineering
BS, Polytechnic University
President, Jerome B. White PC

James Vandezande, AIA, Adjunct Lecturer of Civil Engineering
BS, New York Institute of Technology
Senior Associate, HOK

Exec 21 Program in Construction Management

Mark A. Bloom, Esq., Adjunct Lecturer of Civil Engineering
JD, Fordham University School of Law
Partner, Arent Fox LLP

Albert DiBernardo, Adjunct Lecturer of Civil Engineering
MS, Polytechnic University
Principal, Weidlinger Associates

Peter M. Chorman, AIA, LEED AP, Adjunct Lecturer of Civil Engineering
BS, New York Institute of Technology
Vice President, Jones Lang LaSalle America's, Inc.

Joseph M. Giglio, Adjunct Professor of Civil Engineering
PhD, Northeastern University
Senior Academic Specialist; Executive Professor of General Management Northeastern University
Vice-chairman, Hudson Institute

Francis J. Lombardi, PE, Adjunct Lecturer of Civil Engineering
MS, Columbia University
Chief Engineer, Port Authority of New York and New Jersey (Ret.)

John E. Osborne, Esq., Adjunct Lecturer of Civil Engineering
JD, University of South Carolina Law Center
Partner, John E. Osborne, PC

Raymond R. Savino, Adjunct Lecturer of Civil Engineering
MBA, Bernard Baruch College
Chief Financial Officer, The DeMatteis Organizations

Luis M. Tormenta, PE, Adjunct Lecturer of Civil Engineering
BCE, Manhattan College
Vice-chairman and Chief Executive Officer, LiRo Group

Louis A. Tucciarone, Adjunct Lecturer of Civil Engineering
MSCE, University of California at Berkeley
Senior Vice-President, URS Corp.

Lou Venech, Adjunct Lecturer of Civil Engineering
BA, Columbia College
General Manager, Transportation Policy & Planning, Port Authority of New York and New Jersey

Environmental and Water Resources Engineering

Raoul Cardenas Jr., Adjunct Professor of Environmental Engineering
PhD, New York University

Joon Om, Adjunct Lecturer of Civil Engineering
PhD, Polytechnic University

Haralambos V. Vasiliadis, PE, DEE, D.WRE, CIH, Adjunct Professor
PhD, Polytechnic University
Senior Civil and Environmental Engineer and Technical Advisor, EPM

Sunggho Yoon, Research Scientist, Adjunct Professor of Civil Engineering
PhD, Polytechnic University

Structural and Geotechnical Engineering

Walid Aboumoussa, PE, Adjunct Professor of Civil Engineering
PhD, Polytechnic Institute of NYU
Partner, Antonucci & Associates, Architects & Engineers, LLP

J. Jong Lou, PE, Adjunct Professor of Civil Engineering
PhD, Northwestern University
President, J.J. Lou Associates LLPC

Alfonso Whu, Adjunct Lecturer of Civil Engineering
MS, Polytechnic University

Transportation and Highway Engineering

Andrew Bata, Adjunct Professor of Civil Engineering
MS, Northwestern University
New York City Transit Authority

Philip A. Habib, PE, Adjunct Professor of Transportation Engineering
PhD, Polytechnic Institute of New York
President, Philip A. Habib Associates

Michael Horodniceanu, PE, Adjunct Professor of Transportation Engineering
PhD, Polytechnic Institute of New York
President, MTA Capital Construction Company

Richard Malchow, Adjunct Professor of Transportation Engineering
MS, Union College
Vice President, Management and Budget, Urbitran Associates

Raman Patel, Adjunct Professor of Transportation Engineering
PhD, Polytechnic University

Genaro Sansone, Adjunct Lecturer of Transportation Engineering
MBA, Iona College
New York City Transit Authority

Faculty Emeriti

Alvin S. Goodman, PE, Professor Emeritus
PhD, New York University

Alan H. Molof, Professor Emeritus
PhD, University of Michigan

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Head: Nasir Memon

Mission Statement

The Department of Computer Science and Engineering is committed to preparing undergraduate and graduate students for leadership roles in professional and research activities in the information-technology sector. The department fosters an environment that encourages lifelong learning in the Information Age. Graduates lead and grow in diverse working environments and apply the theories and skills of computer science to real-world problems. Toward this end, the department conducts state-of-the-art research in theoretical and applied computer science and maintains strong educational programs that emphasize breadth and depth in technical knowledge and proficiency in spoken and written communication skills. The environment encourages Invention, Innovation and Entrepreneurship (i²e).

The Department

Computers are now used in practically every area of human endeavor and are radically changing both the way people live and how they view the limits of human capabilities. Job opportunities in computer science and engineering are challenging and diverse. According to the U.S. Bureau of Labor Statistics, current job growth in computer science is among the highest of any technical profession.

NYU Tandon's Department of Computer Science and Engineering offers programs leading to a BS, MS and PhD in [Computer Science](#), and an MS in [Cybersecurity](#). The department offers joint programs with the [Department of Electrical and Computer Engineering](#), leading to a BS in [Computer Engineering](#). The department also offers an advanced certificate in software engineering and cyber security, a dual BS in computer science and electrical engineering/computer engineering, and a minor in computer science.

The department is active in research in several key areas of computer science. Its particular strengths are in security and privacy; big data analysis and visualization; game engineering; and algorithms and theoretical computer science.

The security and privacy concentration-also including cybersecurity, one of the largest growing fields in computer science-has research strengths in peer-to-peer security, digital forensics, biometrics, wireless security, and usable security. Big data management is strong in computing, analyzing, and visualizing urban, scientific, and Web data. Game engineering focuses on computer graphics and perceptual science as well as artificial intelligence in gaming and player modeling. Finally, theoretical computer science is based in computational and discrete geometry, data structures, and machine learning.

The faculty works closely with NYU Tandon's Center for Advanced Technology in Telecommunications (CATT) and has relationships with industries that support research and activity in their special interests.

NYU Tandon School of Engineering has been designated as a Center of Excellence for Information Assurance Education for research by the National Security Agency (NSA) and operates the Scholarship for Service Program (SFS) in Information Assurance.

The department provides students with a wide variety of advanced computer and software systems. These support PC and UNIX technology along with highly distributed networks. The department has four dedicated computer-science laboratories (virtual lab) for upper-level undergraduate students. They are the Software Engineering Laboratory, Parallel and Distributed Systems Laboratory, Visualization and Graphics Laboratory and Computer System and Security Integration Laboratory. Multimedia and Web-based laboratories are also available.

Contact

NYU Tandon School of Engineering
Computer Science and Engineering Department
Two MetroTech Center, 10th Floor
Brooklyn, NY 11201

Tel: (646) 997-3440

Web: <http://engineering.nyu.edu/academics/departments/computer-science-engineering>

Degrees Offered

Bachelor of Science

- [Computer Engineering, B.S.](#) offered by the [Computer Engineering Program](#)
- [Computer Science, B.S.](#)
- [Computer Science and Computer Engineering \(dual major\), B.S.](#)
- [Computer Science Minor](#)

Master of Science

- [Computer Science, M.S.](#)
- [Cybersecurity, M.S.](#)

Doctor of Philosophy

- [Computer Science, Ph.D.](#)

Graduate Certificates

- Cybersecurity
- Information Security Professional
- Information Systems Administration
- Software Engineering

Undergraduate Programs

For undergraduates, the department offers two degrees: a Bachelors of Science in Computer Science (BS CS) and a Bachelors of Science in Computer Engineering (BS CompE). The Bachelor

of Science in Computer Science is a rigorous program that not only covers fundamental computer science subjects, such as object-oriented programming, computer architecture and operating systems, but also provides a number of exciting avenues for specialization including computer and online game development, cyber security, Internet/web systems and applications, bioinformatics, graphics and vision, digital media and management and entrepreneurship. Strong students can also apply to the BS/MS Program where it's possible to earn the BS and MS in computer science at the same time.

The department jointly administers the Bachelors of Science in Computer Engineering with the Department of Electrical and Computer Engineering. It draws on the two departments' strengths to provide a focus on computer system design with integrated understanding of computer hardware and software.

Master's Programs

The MS in Computer Science permits students to take courses either on a full-time or part-time basis. The curriculum has been designed for maximum flexibility. It includes fundamental courses in computer science as well as electives in specialized advanced courses on topics including computer and network security, distributed systems and networking, computer graphics, databases and web search technology. By electing the masters-thesis option, students may also pursue research with faculty members who are internationally recognized in their fields.

The MS in Cybersecurity is a highly innovative program that provides students with the critical knowledge and skills to become experts in cybersecurity, the science of protecting vital computer networks and electronic infrastructures from attacks. The program responds to the growing demand for security specialists in industry as well as government organizations.

PhD Program

The PhD program develops graduate skills in a broad range of areas as well as expertise in one or more specific areas and the ability to think critically and conduct independent research. Outstanding PhD students are advised to apply for financial aid in the form of teaching assistantships, research assistantships or partial-tuition remission.

Software Engineering Certificate

The advanced certificate in software engineering comprises a series of five graduate-level courses to give students the knowledge and skills needed to compete successfully in the software-development arena. Students who want to continue their studies can apply these courses to the MS program in computer science.

Faculty

Professors

Boris Aronov

PhD, Courant Institute of Mathematical Sciences, New York University

Algorithms, computational and combinatorial geometry

Phyllis G. Frankl

PhD, New York University
Software analysis and testing

Juliana Freire

PhD, State University of New York at Stony Brook
Data Analysis and visualization, Big Data, provenance management and analytics, scientific data management, large scale information, web information retrieval and analysis, web crawling, hidden web

K. Ming Leung

PhD, University of Wisconsin
Scientific computing, computer simulation, neural networks

Nasir Memon, Department Head

PhD, University of Nebraska
Data compression, image and video processing, computer security, multimedia computation and communication

Keith W. Ross, Leonard J. Shustek Distinguished Professor

PhD, University of Michigan
Computer networking, Internet research, multimedia networking, scholastic modeling

Claudio T. Silva

PhD, State University of New York at Stony Brook
Big Data and Urban Systems, Visualization and Data Analysis, Geometry Processing

Associate Professors**Yi-Jen Chiang**

PhD, Brown University
Computer graphics: out-of-core scientific visualization, isosurface extraction, surface simplification, virtual reality, air traffic control. Computer algorithms: I/O algorithms, computational geometry, graph algorithms, approximation algorithms, data structures

Lisa Hellerstein

PhD, University of California at Berkeley
Computational learning theory, machine learning, algorithms, complexity theory, discrete mathematics

John Iacono

PhD, Rutgers-The State University of New Jersey
Computational geometry, data structures, algorithms

Torsten Suel

PhD, University of Texas at Austin
Design and analysis of algorithms, database systems, parallel computation, experimental algorithmics

Julian Togelius

PhD, University of Essex

AI, player modeling, procedural content generation, automatic game design, believable bot behavior, coevolution, neuroevolution, genetic programming and monte carlo tree search

Edward K. Wong, Associate Professor of Computer Science

PhD, Purdue University

Computer vision, image analysis, pattern recognition, computer graphics

Assistant Professors

Enrico Bertini

PhD, Sapienza University of Rome

Information Visualization, Human Computer Interaction and

Justin Cappos

PhD, University of Arizona

Practical security, virtualization, cloud computing, software update systems, testbeds

Rumi Chunara

PhD, Harvard University

Information retrieval, spatio-temporal analyses, data mining, machine learning and epidemiological methods for new data sources

Brendan Dolan-Gavitt

PhD, Georgia Institute of Technology

Program analysis, virtualization security, memory forensics, and embedded and cyber-physical systems

Damon McCoy

PhD, University of Colorado, Boulder

Security and privacy of large-scale systems

Andy Nealen, Assistant Professor of Computer Science

PhD, TU Berlin

Computer Graphics, Game Design and Game Engineering

Industry Faculty

Haldun Hadimioglu

PhD, Polytechnic University

Computer architecture, parallel processing, reconfigurable systems and application specific processors

Thomas Reddington

MS Physics, University of Pittsburg, PA

John B. Sterling

MS, New York University

Game programming, software development

Fred J. Strauss, Director of CSE programs in Melville Campus-Long Island

MS, Polytechnic Institute of New York

Software engineering, project management, distributed systems

Research Faculty

Gad M. Landau

PhD, Tel-Aviv University (Israel)

Serial and parallel algorithms for problems related to strings, computation biology, pattern recognition, communication networks

Sameer Patil

PhD, University of California, Irvine

Usable privacy and security, human-computer interaction, social computing

Instructors

Daniel Katz-Braunschweig

MS, Iona College

Faculty Emeriti

Henry Ruston

PhD, University of Michigan

Martin L. Shooman

DEE, Polytechnic Institute of Brooklyn

Richard Van Slyke

PhD, University of California at Berkeley

Combinatorial optimization especially applied to telecommunications systems, distributed optimization

Stuart A. Steele

PhD, Pennsylvania State University

Software engineering and management, programming languages

Programs

Bachelor of Science

- [Computer Science and Computer Engineering \(dual major\), B.S.](#)

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Head: H. Shivendra Panwar

Mission Statement

The department's mission is to engage students who seek educational achievement as the nation enters a new age with new demands and opportunities. The goal is to provide students with a broad based education for electrical- and computer-engineering careers. NYU Tandon School of Engineering students gain the skills to become creative leaders in their professional careers with the passion and desire to discover, invent, innovate, apply and advance new science and technology to solve the world's most critical problems.

The Department

Electrical and computer engineers-whose technical skills have produced innovations in telephones, electric power systems, rapid transit, radio, television, medical electronics, computers, microelectronics, the Internet and wireless communications-have contributed more to the quality of 20th-century life than any other profession. Twenty-first century engineering innovation will be equally exciting.

The Department of Electrical and Computer Engineering is well respected worldwide for its major contributions to the profession and its tradition of teaching and research excellence. NYU Tandon electrical and computer engineering graduates are prominent in university faculties, industrial labs and company boardrooms, spanning the range of the electrical, electronic and information-technology industries.

The department enters the 21st century with strong teaching and research programs in the most exciting digital-age fields: the Internet, wireless communications, computers, multimedia signal processing, robotics, automatic control and electric-power generation and distribution.

In the intimate NYU Tandon environment, students benefit from frequent access to faculty members and laboratories at the forefront of innovation. In the spirit of entrepreneurship, NYU Tandon's infrastructure encourages faculty and students to transfer their inventions to industry and to start their own companies.

The department hosts the Center for Advanced Technologies in Telecommunications (CATT), a New York State-sponsored research center, and NYU Wireless, the world's first academic research center combining Wireless, Computing, and Medical applications. Together, these centers greatly strengthen the department in telecommunication networks and in wireless-communications research and education.

Contact

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E-mail: eceinfo@poly.edu

Web: <http://engineering.nyu.edu/academics/departments/electrical>

The Profession

The rapidly growing profession of electrical engineering has evolved from its early beginnings in electric- power generation and distribution through the development of radio, television, control and materials to computers, telecommunications and health care. In the last century, electrical engineers have created advances in power distribution, computers and communications that have changed the world. Their inventions have made the world a smaller, safer place and allow for immediate reporting and images from distant places that make world events part of daily life.

While electrical engineering undergraduate and graduate students concentrate on areas of electrical science, graduates apply their training to diversified fields such as electronic design, bioengineering, city planning, astronautics, radio astronomy, system engineering, image processing, telemetry, the Internet, computer design, management and patent law. As students mature and realize their abilities, they may choose professional lives in engineering, government, or education.

The expertise of NYU Tandon's electrical engineering faculty covers a wide range of fields. Principal areas of teaching and research are microelectronic devices and systems; computer engineering; telecommunications; speech and image processing; microwave engineering; wireless communications; power systems and energy conversion; plasma science and engineering; and systems and control engineering.

Additional information about electrical engineering careers can be found online at www.ieee.org/organizations/eab/student_careers.htm.

Degrees Offered

The Department of Electrical and Computer Engineering offers the following degree and certificate programs. Separate sections of this catalog present the objectives, requirements, advising resources and courses for individual programs.

Bachelor of Science

- [Computer Engineering, B.S.](#) offered by the [Computer Engineering Program](#)
- [Electrical Engineering, B.S.](#) offered by the [Electrical Engineering Program](#)
- [Electrical Engineering and Computer Engineering \(dual major\), B.S.](#)

Master of Science

- [Computer Engineering, M.S.](#) offered by the [Computer Engineering Program](#)
- [Electrical Engineering, M.S.](#) offered by the [Electrical Engineering Program](#)

Doctor of Philosophy

- [Electrical Engineering, Ph.D.](#) offered by the [Electrical Engineering Program](#)

Special Undergraduate Options

The BS/MS Option: This program is available to exceptional undergraduate students, enabling them to earn both a bachelor's and a master's degree.

Possible BS/MS combinations include BS in Electrical or Computer Engineering with a MS in Electrical Engineering, Computer Engineering or Computer Science.

[Electrical Engineering and Computer Engineering \(dual major\), B.S.:](#) A student can earn a Bachelor of Science degree in Electrical and Computer Engineering by completing 141 credits.

Minors: [Electrical Engineering Minor](#) or [Computer Engineering Minor](#).

Student Organizations

NYU Tandon students may join student chapters of these professional organizations: the Institute of Electrical and Electronics Engineers (IEEE) and Eta Kappa Nu, the Electrical Engineering Honor Society.

Specialty Labs

The department keeps pace with dynamic advances in electrical and computer engineering by maintaining state-of-the-art laboratories for instruction and experimentation. Laboratory courses combine lectures, experiments and project work. These courses also provide students with a rich set of elective choices, opportunities to work on senior projects with faculty researchers, valuable hands-on experience to enhance and supplement material taught in lecture classes, and forums to practice their oral and written communication skills.

The Wireless Lab provides formal experiments, lectures and project work on state-of-the-art, commercial spread-spectrum wireless access systems, including bit-error rate analysis and UHF channel propagation measurements.

The Multimedia Lab offers students hands-on experience to acquire, process and transmit voice, audio, image and video signals to create multimedia documents and to configure networked multimedia applications.

The Local Area Networks Lab includes a set of weekly experiments using Linux-based terminals, Ethernet LANs, routers and bridges and associated software with which to conduct a variety of LAN/WAN experiments and projects.

The High-Speed Networking Lab, equipped with various equipment and tools, allows faculty and students to build hardware prototypes (VLSI/FPGA chips and PCB) and software test bed to demonstrate their research concepts in high-performance routers, network security and network on chip.

The VLSI Design Lab treats Very Large-Scale Integrated-circuit design, performance analysis and circuit characterization, using industry-standard VLSI CAD tools and hardware-description languages such as VHDL. Students study the design of CMOS logic, standard cells, gate arrays and mixed-signal (analog/digital) circuits.

The Electric Power Laboratory fosters education and research for undergraduate and graduate studies. Equipment includes modern data-acquisition equipment, smart-power supplies and loads, digital meters, computers, power transformers and classical rotating machine pairs for dynamic testing and loading. In addition, static converters are available for experiments on Smart Grid and Distributed Resources, such as solar and fuel cells, wind power and variable-speed drives.

The Control/Robotics Lab provides a variety of experiments and project work focusing on feedback control, data acquisition and computer control.

The Microwave Lab treats the design, fabrication and testing of passive and active circuits and antennas using modern CAD and measurement software and hardware.

Center for Advanced Technology in Telecommunications

Through the New York State Center for Advanced Technology in Telecommunications (CATT), electrical and computer engineering faculty collaborate with industry in research, education and technology transfer in telecommunications and information systems. CATT is distinguished for its innovations in many fast-moving areas, including broadband networks, peer-to-peer networking, switch design and implementation, security hardware, ad-hoc wireless networks, cellular networks, wireless local area networks, software design and reliability, search engine technology, network design tools, traffic planning and capacity engineering, image and video coding and transport.

NYU Wireless

NYU WIRELESS is a multi-disciplinary academic research center that offers an unprecedented and unique set of skills.

Centered at New York University's Brooklyn engineering location and involving faculty and students throughout the entire NYU community, NYU WIRELESS offers its industrial-affiliate sponsors, faculty members, and students a world-class research environment that is creating the fundamental theories and techniques for next-generation mass-deployable wireless devices across a wide range of applications and markets.

This center combines NYU Tandon's School of Engineering program with NYU's School of Medicine and the Courant Institute of Mathematical Sciences, and offers a depth of expertise with unparalleled capabilities for the creation of new wireless net.

Faculty

Professors

Steve Arnold, University and Thomas Potts Professor of Physics (Joint appointment with Department of Applied Physics)
PhD, City University of New York
Microparticle photophysics, photonic atom biosensors

H. Jonathan Chao, Professor of Electrical and Computer Engineering
PhD, The Ohio State University
Network security, high-performance routers, network on chip

Elza Erkip, Professor of Electrical and Computer Engineering
PhD, Stanford University

Wireless communication, communication theory, information theory

Zhong-Ping Jiang, Professor of Electrical and Computer Engineering
PhD, École des Mines de Paris (France)

Control systems, complex networks

Ramesh Karri, Professor of Electrical and Computer Engineering
PhD, University of California, San Diego

VLSI, CAD, computer engineering

Farshad Khorrami, Professor of Electrical and Computer Engineering
PhD, The Ohio State University

Robotics, control systems

Spencer P. Kuo, Professor of Electrical and Computer Engineering
PhD, Polytechnic Institute of Brooklyn Plasmas and electromagnetics

Yong Liu, Professor of Electrical and Computer Engineering
PhD, University of Massachusetts, Amherst

Communication networks

I-Tai Lu, Professor of Electrical and Computer Engineering
PhD, Polytechnic Institute of Brooklyn

Electromagnetics, acoustics, wireless communication

Shivendra S. Panwar, Professor of Electrical and Computer Engineering, Director of the New York State Center for Advanced Technology in Telecommunications

PhD, University of Massachusetts, Amherst

Communication networks

S. Unnikrishna Pillai, Professor of Electrical and Computer Engineering
PhD, University of Pennsylvania

Signal processing and communications

Ivan W. Selesnick, Professor of Electrical and Computer Engineering
PhD, Rice University

Signal processing

Yao Wang, Professor of Electrical and Computer Engineering
PhD, University of California, Santa Barbara

Image and video processing, computer vision, medical imaging

Zivan Zabar, Professor of Electrical and Computer Engineering
Sc.D., Technion - Israel Institute of Technology

Electric power systems, electric drives, power electronics

Associate Professors

Dariusz Czarkowski, Associate Professor of Electrical and Computer Engineering
PhD, University of Florida
Power electronics and systems, electric drives

Nirod K. Das, Associate Professor of Electrical and Computer Engineering
PhD, University of Massachusetts
Electromagnetics, antennas, microwave integrated circuits

Francisco de Leon, Associate Professor of Electrical and Computer Engineering
PhD, University of Toronto (Canada)
Power-system analysis, distributed generation systems, smart grid

Sundeep Rangan, Associate Professor of Electrical and Computer Engineering
PhD, University of California, Berkeley
Wireless communication, signal processing and estimation, information theory

Peter Voltz, Associate Professor of Electrical and Computer Engineering
PhD, Polytechnic Institute of New York
Communications and signal processing

Assistant Professors

Siddharth Garg, Assistant Professor of Electrical and Computer Engineering
PhD, Carnegie Mellon University
Computer engineering

Shaloo Rakheja, Assistant Professor of Electrical and Computer Engineering
PhD, Georgia Institute of Technology
Nanoscale electronics

Davood Shahrjerdi, Assistant Professor of Electrical and Computer Engineering
PhD, University of Texas at Austin
Electronic materials, device structures and circuits

Quanyan Zhu, Assistant Professor of Electrical and Computer Engineering, Mathematics
PhD, University of Illinois at Urbana-Champaign
Game theory and applications, optimization

Industry Faculty

Matthew Campisi, Industry Assistant Professor of Electrical and Computer Engineering
MS, Polytechnic University
Signal processing, medical imaging

Michael Knox, Industry Associate Professor of Electrical and Computer Engineering
PhD, Polytechnic University
Wireless communications, RF and microwave components, analog-circuit design

Research Faculty

Thanasis Korakis, Research Assistant Professor
PhD, University of Thessaly (Greece)
Wireless networks

Pei Liu, Research Assistant Professor
PhD, Polytechnic University
Wireless Communications and Networks

Yang Xu, Research Assistant Professor
PhD, Tsinghua University (China)
High-speed networking

Adjunct Faculty

Walid Ahmed, Adjunct Lecturer
PhD, Queens University (Canada)

Barbaros Aslan, Adjunct Lecturer
PhD, Cornell University

Eric Brendel, Adjunct Lecturer
MS, Pennsylvania State University

Mark Cavallaro, Adjunct Lecturer
MBA, Iona College

Tapan Chakraborty, Adjunct Lecturer
PhD, Rutgers University

Robert DiFazio, Adjunct Lecturer
PhD, Polytechnic University

Gusteau Duclos, Adjunct Lecturer
PhD, Polytechnic University

Barbara Gates-Karnik, Adjunct Lecturer
PhD, Fletcher School of Tufts University

Jalal Gohari, Adjunct Lecturer
BS, The City University of New York

Donald Grieco, Adjunct Lecturer
MBA, Long Island University, CW Post
MS, Polytechnic Institute of Brooklyn

Ian Harris, Adjunct Lecturer
M.Sc, Herriot-Watt University (Scotland)

Noah Jacobsen, Adjunct Lecturer
PhD, University of California, Santa Barbara

Lurng-Kuo Liu, Adjunct Lecturer
PhD, University of Maryland

Xiaoqiao Meng, Adjunct Lecturer
PhD, University of California, Los Angeles

Paul Moon, Adjunct Lecturer
PhD, University of Manitoba (Canada)

Hyung Myung, Adjunct Lecturer
PhD, Polytechnic University

Charles Perng, Adjunct Lecturer
PhD, University of California, Los Angeles

Richard Stern, Adjunct Lecturer
MS, Polytechnic University

George Sullivan, Adjunct Lecturer
MS, Polytechnic University

Dong Sun, Adjunct Lecturer
PhD, Stevens Institute of Technology

Sindhu Suresh, Adjunct Lecturer
PhD, Polytechnic Institute of NYU

Chin-Tuan Tan, Adjunct Lecturer
PhD, Nanyang Technological University (Singapore)

Gerald Volpe, Adjunct Lecturer
PhD, New York University

David Wang, Adjunct Lecturer
PhD, Polytechnic University

Fred Winter, Adjunct Lecturer
PhD, Polytechnic University

Catherine Zhang, Adjunct Lecturer
PhD, Harvard University

Li Zhang, Adjunct Lecturer
PhD, Columbia University

Zhenqxue Zhao, Adjunct Lecturer
PhD, Polytechnic University

Faculty Emeriti

David J. Goodman, Professor of Electrical and Computer Engineering
PhD, Imperial College, University of London (England)

Leonard Bergstein, Professor Emeritus of Electrical Engineering
PhD, Polytechnic Institute of Brooklyn

Henry L. Bertoni, Professor Emeritus of Electrical Engineering
PhD, Polytechnic Institute of Brooklyn

Leo Birenbaum, Associate Professor Emeritus of Electrical Engineering and Electrophysics
MS, Polytechnic Institute of Brooklyn

Donald Bolle, Professor Emeritus of Electrical Engineering, Emeritus Provost
PhD, Purdue University

Joseph J. Bongiorno, Jr., Professor Emeritus of Electrical Engineering
DEE, Polytechnic Institute of Brooklyn

Robert Boorstyn, Professor Emeritus of Electrical Engineering
PhD, Polytechnic Institute of Brooklyn

Edward S. Casedy, Professor Emeritus of Electrical Engineering
DrEng, Johns Hopkins University

Bernard R. S. Cheo, Professor Emeritus of Electrical Engineering
PhD, University of California at Berkeley

Douglas A. Davids, Associate Professor Emeritus of Electrical Engineering
PhD, Johns Hopkins University

Rudolf F. Drenick, Professor Emeritus of Electrical Engineering
PhD, University of Vienna (Austria)

Herman Farber, Associate Emeritus Professor of Electrophysics
MEE, Polytechnic Institute of Brooklyn

Richard A. Haddad, Professor Emeritus of Electrical Engineering
PhD, Polytechnic Institute of Brooklyn

Donald F. Hunt, Professor Emeritus of Electrical Engineering
BS, University of Pennsylvania

Ludwik Kurz, Professor Emeritus of Electrical Engineering
EngScD, New York University

James T. LaTourette, Professor Emeritus of Electrophysics
PhD, Harvard University

Nathan Marcuvitz, University Professor Emeritus
DEE, Polytechnic Institute of Brooklyn

Maurice C. Newstein, Professor Emeritus of Electrophysics
PhD, Massachusetts Institute of Technology

Arthur A. Oliner, Professor Emeritus of Electrophysics
PhD, Cornell University

Istvan Palocz, Professor Emeritus of Electrical Engineering and Electrophysics
PhD, Polytechnic Institute of Brooklyn

Philip E. Sarachik, Professor Emeritus of Electrical Engineering
PhD, Columbia University

Harry Schachter, Professor Emeritus of Electrical Engineering
PhD, Polytechnic Institute of Brooklyn

Benjamin Senitzky, Professor Emeritus of Electrophysics
PhD, Polytechnic Institute of Brooklyn

Sidney S. Shamis, Professor Emeritus of Electrical Engineering
MS, Stevens Institute of Technology

Leonard G. Shaw, Professor Emeritus of Electrical Engineering
PhD, Stanford University

Jerry Shmoys, Professor Emeritus of Electrical Engineering
PhD, New York University

Theodore Tamir, University Professor Emeritus
PhD, Polytechnic Institute of Brooklyn

Wen-Chung Wang, Professor Emeritus of Electrical Engineering and Electrophysics
PhD, Northwestern University

Gerald Weiss, Professor Emeritus of Electrical Engineering
DEE, Polytechnic Institute of Brooklyn

Dante C. Youla, University Professor Emeritus
MS, New York University

DEPARTMENT OF FINANCE AND RISK ENGINEERING

Peter Paul Carr: Department Chair

Barry Blecherman: Deputy Department Chair

Mission

The mission of the Department of Finance and Risk Engineering is to create world-class research and educational programs that provide students with superior training and skills that bridge theory and practice in today's cutting-edge financial services industry and its many associated professions.

The Department

The Department of Finance and Risk Engineering (FRE) is a diversified research and degree granting department - the largest of its kind in the U.S. with approximately 300 students and the largest alumni base in the world. The Department provides a multi-faceted education through the MS in Financial Engineering program and an undergraduate Minor in Finance.

The department pursues intensive research and an educational program in global finance as well as interdisciplinary financial research relating to environmental issues, cyber security, urban and civil infrastructure, and other topics dependent on important financial considerations. Our program is recognized as being at the forefront of research in the financial field with faculty from around the world who are highly ranked by the significance of their contributions. The department is staffed by a number of leading academics and practitioners, and boasts a number of outstanding affiliated professors and cutting-edge traders, hedge fund managers and academics turned practitioners by the lure of Wall Street. This combination of talent, theoretically and practically-based, national and international, provides a first-rate education embedded in answering the real needs of the financial services sector that recognizes the continuous growth of finance, financial insurance and risk engineering, technology, financial engineering and management in an increasingly global world.

The department's educational and MS degree-granting programs, research and extracurricular activities seek to bridge theory and practice and meet the many and complex challenges that the financial engineering professions are confronted with. The department's curriculum combines a rigorous vision of economics, finance, applied quant finance, actuarial science and financial technology in their theoretical and practical setting in a global world and global financial markets. In addition, the department provides interdisciplinary opportunities to combine studies, such as computer science, mathematics and engineering with financial management and technology and risk engineering.

Graduates may assume diversified employment positions in the many facets that make up the financial engineering profession. Trading desks, hedge fund and investment managers, CFOs, quantitative professionals, insurance firms, financial technology managers as well as financial and specialized risk managers define the broad set of professions that are open to NYU Tandon School of Engineering's graduates in financial engineering. The department regularly adapts and updates the program to reflect the changing industry, giving students the necessary competitive edge in the job market. Top employers regularly recruit our graduates for the superior training they have to lead at the forefront of the field. Additionally, the department maintains strong connections with international partners, which include distinguished universities and institutions in locations such as

France, Italy and Israel. The global perspective students gain and the relationships they develop exponentially expand their options for the future.

Students have opportunities to acquire new insights and build practical solutions to the emerging challenges in the ever-changing world of finance through local and global industry collaborations. Through the Extreme Risk Initiative, the department fosters active collaboration in the comprehensive analysis and assessment of risks as applied to derivatives, credit risk, default models in finance, black swans and rare events finance, global finance and more. Students gain the skills to recognize patterns and develop safeguards when dealing with such events as collapsing markets, influential environmental issues or other major disasters.

The Profession

Financial engineering is driven by financial practice to bridge means and ends and to reconcile the theoretical foundations of financial economics with the reality of financial markets. Finance is about money and therefore, all problems that can be transformed to a real or to a synthetic financial money framework can profit by the extent to which money is used and exchanged. It is in such a perspective, that many economic and engineering problems can be conceived as “financial engineering problems.” This conception of financial engineering underpins the NYU Tandon School of Engineering programs in finance. In this spirit, our goal and objectives pertain to trading, speculating, investing, pricing and corporate and risk management but also to pricing and managing the risks of infrastructure, the environment and business management. In this sense, financial engineering as with all technology and scientific based professions is a “work in progress,” whose purpose is to present and communicate with practitioners and financial engineering students to better prepare their entering the world of finance. We meet the challenges of financial markets-in analysis, pricing, trading and investing-for technology managers and computational finance engineers in fast-moving, highly rewarding careers that create value enabled by finance, technology and computational mathematics.

Contact

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Web: <http://engineering.nyu.edu/academics/departments/finance>

Degrees Offered

Master of Science

- [Financial Engineering, M.S.](#)

Undergraduate Minor

- [Finance Minor](#)

Faculty

Charles S. Tapiero

Topfer Distinguished Professor of Financial Engineering

Nassim Nicholas Taleb

Distinguished Professor of Risk Engineering

Andrew Papanicolaou

Assistant Professor

Zhaoxia Xu

Assistant Professor

Barry Blecherman

Deputy Department Chair and Industry Professor

Agnes Tourin

Industry Assistant Professor

Segolene Dessertine-Panhard

Post-Doctoral Fellow

Unurjargal Nyambuu

Post-Doctoral Fellow

Adjunct Faculty

Sassan Alizadeh

Lucas Bernard

Paul Biederman

Raphaelle Chappe

Jierong Cheng

Gregg Fisher

Roy Freedman

Evan Gallagher

Sebastien Galy

Saar Golde

Michael Hayes
Benjamin Hoff
Andrey Itkin
Mirela Ivan
Ashish Kohli
Norris Larrymore
Brian R. Lessing
Victor Makarov
Naresh Malhotra
Shlomo Mandel
Ingrid Marshall
Asha Matthei
Warren Matthei
Pape Ndiaye
Frederick Novometsky
Jerzy Pawlowski
Antonio Pepenella
Daniel Rodriguez
Maurice Rubinraut
Anatoly Schmidt
Frederic Siboulet
Ron Slivka
Song Tang
Daniel Totouom-Tangho
Edward Dean Weinberger
Jason Yarmish
Anne Zissu

International Faculty Affiliates

- Professor Alain Bensoussan, Hong Kong University and the University of Texas, Dallas

- Professor Sergio Bianchi, The University of Cassino, Italy
- Professor Ron Kennett, University of Turin
- Professor Konstantin Kogan, Bar-Man University
- Professor Bertand Munier, The Maurice Allais Foundation, France
- Professor Stylianos Perrakis, John Molson School of Business, Concordia University, Canada
- Professor Bouchra Rahmouni Benhida, University Hassan I, Morocco
- Dr. Lorne Switzer, John Molson School of Business, Concordia University, Canada
- Professor Mina Teicher, Bar Ilan University, The US-Israel Bi National Science Foundation
- Professor Pierre Vallois, University of Lorraine, France

DEPARTMENT OF MATHEMATICS

Head: Erwin Lutwak

Mission Statement

The Department of Mathematics is committed to excellence in the teaching and research of mathematics. Current strengths in research include convex geometric analysis, differential topology, mathematical physics and partial differential equations. The degree programs offered by the department provide both a solid foundation in mathematics as well as exposure to how mathematics is used in other fields. A complete spectrum of undergraduate and graduate mathematics courses are available to math majors.

The Department

The department offers BS, MS and PhD degrees in Mathematics, as well as a BS degree with a dual major in [Mathematics and Physics](#). All three degrees provide a student with a solid basis for future studies in mathematics or careers that require mathematical skills. A PhD student is required to write a dissertation, where the student is able to introduce and develop significant new mathematical knowledge. The department supports and even encourages PhD students to work with advisors from other departments on topics involving the development of new mathematical tools for other disciplines.

Degrees Offered by the [Mathematics Program](#)

Bachelor of Science

- [Mathematics, B.S.](#)
- [Physics and Mathematics, B.S.](#) (with the [Department of Applied Physics](#))

Master of Science

- [Mathematics, Examination Option, M.S.](#)
- [Mathematics, Thesis Option, M.S.](#)

Doctor of Philosophy

- [Mathematics, Ph.D.](#)

Contact

Department of Mathematics
NYU Tandon School of Engineering
Six MetroTech Center
Brooklyn, NY 11201
Tel: (646) 997-3850
Web: math.engineering.nyu.edu

Faculty

Professors

Erwin Lutwak, Professor of Mathematics, Department Head
PhD, Polytechnic Institute of New York
Convex geometric analysis

Edward Y. Miller, Professor of Mathematics
PhD, Harvard University
Differential topology

Michael O'Neil, Assistant Professor of Mathematics
PhD, Yale University
Fast algorithms, computational physics, partial differential equations

Deane Yang, Professor of Mathematics
PhD, Harvard University
Convex geometric analysis

Yisong Yang, Professor of Mathematics
PhD, University of Massachusetts at Amherst
Mathematical physics, partial differential equations

Gaoyong Zhang, Professor of Mathematics
PhD, Temple University
Convex geometric analysis

Industry Faculty and Research Faculty

David V. Chudnovsky, Distinguished Industry Professor of Mathematics
PhD, Institute of Mathematics, Ukrainian Academy of Science
Theoretical mathematics: number theory, partial differential equations, Hamiltonian systems. Mathematical physics: field theories, quantum systems. Computer science: computer algebra and complexity, large-scale numerical mathematics, parallel computing and digital signal processing

Gregory V. Chudnovsky, Distinguished Industry Professor of Mathematics
PhD, Institute of Mathematics, Ukrainian Academy of Science
Number theory: analytic number theory, diophantine approximations and transcendence theory. Mathematical physics: nonlinear equations, quantum and classical fields. Computer science: computer algebra and complexity, large-scale numerical mathematics, parallel computing and digital signal processing

Harvansh Manocha, Industry Professor of Mathematics
PhD, Panjab University (India)
Lie groups and special functions

Jiazu Zhou, Research Professor
PhD, Temple University
Convex geometry, integral geometry

Teaching Faculty

Vanita Khosla, Instructor
MS, Polytechnic Institute of NYU
Financial Engineering

Luciano Medina, Instructor
MS, Polytechnic Institute of NYU
Partial differential equations and mathematical biology

Jinghua Qian, Instructor
PhD, Tufts University
Probability and stochastic process, statistics

Tom Pranayanuntana, Instructor
PhD, Polytechnic University
Matrix inequalities, discrete convexity and convex geometry

Lindsey Van Wagenen, Senior Lecturer
PhD, Columbia University
Applied physics

James Wielaard, Industry Associate Professor

Fang Zhao, Instructor
MS, Polytechnic Institute of NYU
Mathematics education

Faculty Emeriti

Heinrich Guggenheimer
Leon Herbach
Harry Hochstadt
Burton Lieberman
Clifford W. Marshall
Joel C. W. Rogers
Lesley Sibner
Andrew J. Terzuoli
Hermann Waldinger
Georges Weill
Erich Zauderer

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

Head: Richard Thorsen

Mission Statement

The mission of the Department of Mechanical and Aerospace Engineering is to prepare students for careers in mechanical and related engineering disciplines for professional development, life-long learning and contributions to society.

Furthermore, the department adds value to the student's market and career potential by emphasizing an understanding of the physical world through projects, tools and practice, and by providing the foundation tools for innovation, invention and entrepreneurship.

The Department

The Department of Mechanical and Aerospace Engineering is an ideal destination for U.S. and international students interested in joining a dynamic department that offers educational and research opportunities in traditional and emerging areas of mechanical engineering. The department not only stresses creativity and innovation, but also emphasizes fundamental understanding of the underlying sciences, design methodologies and economic and social impact of engineered products. NYU Tandon School of Engineering graduates hold leadership positions worldwide in careers spanning academia, industry and governmental and non-governmental organizations in both the engineering and other professional fields.

The undergraduate mechanical engineering curriculum balances fundamental science and engineering principles and engineering practice. Courses emphasize engineering science fundamentals and computer applications that employ modern engineering tools. The program heavily emphasizes laboratory experience, engineering design and student participation in research programs.

Graduate studies provide a broad understanding of the mechanical engineering field combined with a deep understanding of one of its sub-disciplines, while they promote interdisciplinary studies, student professional development and lifelong learning skills. Traditional and emerging mechanical engineering- related areas of study are available. Program flexibility allows students to satisfy intellectual interests and pursue professional goals. Coursework and research opportunities are available in areas that include dynamical and complex systems, controls, composite materials and nano-materials, biomimetics, lasers and optical sensors, fluid mechanics and energy systems and fire research. State-of-the-art laboratory and computational facilities support the educational and research enterprise, while the low faculty-to-student ratio warrants the development of close student-faculty ties. The graduate program's relatively small size allows students to form close relationships with faculty Adviser, greatly strengthening and enriching the students' experience and intellectual growth.

Students are encouraged to join NYU Tandon's student chapters of the American Society of Mechanical Engineers (ASME), American Institute of Aeronautics and Astronautics (AIAA), National Society of Black Engineers (NSBE), Engineers Without Borders (EWB), Society of Women

Engineers (SWE) and Society of Automotive Engineers (SAE), as well as honor societies, Pi Tau Sigma for mechanical engineers and Tau Beta Pi for engineers in general.

NYU Tandon students benefit significantly from participation in cutting-edge research (funded by government, industry and not-forprofit organizations), access to state-of-the-art laboratories, collaboration with a faculty that cares greatly for students and devotes its energy to their growth, and living in one of the world's greatest cities.

The Profession

Mechanical engineers design, build and maintain the products and processes that define industrial and post-industrial societies. In its early days, mechanical engineering emerged as the discipline dedicated to producing power and building the first industrial machines. Mechanical engineering has evolved to the broadest of all engineering disciplines. Today, mechanical engineers are prime movers of innovation and invention in a wide range of dynamic and continually evolving industries. These industries include power production and aerospace, robotics and manufacturing, transportation and communication, electronics and mechatronics, and biotechnology and biomimetics. Mechanical engineers also have a long tradition of leadership in helping to develop and safeguard the natural environment by creating breakthroughs in such areas as resource conservation, improved efficiency of energy-consuming devices, development of codes for a safer technological environment, and new greenenergy sources. The breadth of their training allows some mechanical engineers to apply their training to the diversified fields of computer engineering, nanotechnology, software development, financial engineering, bioengineering, astronautics, systems engineering, corporate management, law and medicine. As NYU Tandon graduates mature and realize their abilities, their professional lives may center on engineering research, government, business, education or entrepreneurship.

Contact Information

NYU Tandon School of Engineering
Six MetroTech Center
Brooklyn, NY 11201

Web: <http://engineering.nyu.edu/academics/departments/mechanical>

Degrees Offered

The department offers degree programs in mechanical engineering at the Bachelor of Science, Master of Science and Doctor of Philosophy levels. The undergraduate Bachelor of Science program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board of Engineering and Technology (ABET).

The objectives of the undergraduate mechanical-engineering program are for its graduates to: 1) engage in, and advance in, professional careers in mechanical or related engineering, or other career paths that include industry, academia and governmental or nongovernmental organizations, and 2) seek continuous professional development and life-long learning through graduate-school studies, continuing-education credits and professional registration.

The department offers BS, MS and PhD degrees in mechanical engineering. Further information on the programs can be found [here](#).

Bachelor of Science

- [Mechanical Engineering, B.S.](#)
- [Mechanical Engineering, Aerospace Minor, B.S.](#)
- [Mechanical Engineering with minor in Interdisciplinary Studies in Nuclear Sciences and Engineering](#)
- [Mechanical Engineering Minor](#)

Master of Science

- Mechanical Engineering with concentrations in [mechanics and structural systems](#), [controls and dynamic systems](#), and [energy engineering and policy](#)
- [Mechatronics and Robotics, M.S.](#)

Doctor of Philosophy

- [Mechanical Engineering, Ph.D.](#) with concentrations in aerospace engineering, materials engineering, mechanics and structural systems, controls and dynamic systems, and energy engineering and policy

Faculty

Professors

Kurt H. Becker, Professor of Mechanical Engineering and Applied Physics and Vice Dean of Academic Affairs

PhD, Universität des Saarlandes, Germany

Atomic, molecular and chemical physics, plasma physics

Vikram Kapila, Professor of Mechanical Engineering

PhD, Georgia Institute of Technology

Linear/nonlinear control, distributed spacecraft formation flying and attitude control, mechatronics

Sunil Kumar, Professor of Mechanical Engineering and Associate Provost for Abu Dhabi Engineering

PhD, University of California at Berkeley

Thermal fluid sciences, applied mathematics

Said Nourbakhsh, Professor of Materials Science

PhD, Leeds University (England)

Phase transformation, electron microscopy, composite and smart materials, ferroelectric thin films

Maurizio Porfiri, Professor of Mechanical and Aerospace Engineering

PhD, Virginia Polytechnic Institute and State University

Dynamical systems theory and applications, mechanics of advanced materials, multiphysics modelling, smart materials and structures

Michael J. Shelley, Professor of Mechanical Engineering and Lilian and George Lyttle Professor of Applied Mathematics at Courant Institute of Mathematical Sciences at New York University

PhD, University of Arizona

Fluid dynamics, computational physics, numerical analysis

Katepalli Sreenivasan, Professor of Mechanical Engineering, NYU University Professor, and Dean of Polytechnic School of Engineering

PhD, Indian Institute of Science

Fluid dynamics, turbulence, complex fluids, cryogenic helium, nonlinear dynamics

Associate Professors

Salvatore Grimaldi, Associate Professor of Mechanical Engineering and Associate Professor of Applied Hydrology at Università degli Studi della Tuscia

PhD, Università di Roma "La Sapienza"

Applied and statistical hydrology, GIS terrain analysis, tracer methods for hydrological applications

Nikhil Gupta, Associate Professor of Mechanical Engineering

PhD, Louisiana State University

Micro- and nano-composite materials/mechanics

Richard S. Thorsen, Associate Professor of Mechanical and Aerospace Engineering, Department Chair, and Vice President Emeritus

PhD, New York University

Heat transfer, energy systems, solar and nuclear energy

George Vradis, Associate Professor of Mechanical Engineering

PhD, Polytechnic University

Computational fluid dynamics and heat transfer, energy systems

Assistant Professors

Joo Hyun Kim, Assistant Professor of Mechanical Engineering and Assistant Professor of Physical Therapy at New York University

PhD, The University of Iowa

Multibody system dynamics, optimization control, robotics, biomechanics

Sean Peterson, Assistant Professor of Mechanical Engineering and Assistant Professor of Mechanical & Mechatronics Engineering at University of Waterloo, Canada

PhD, Purdue University

Fluid mechanics, bio-fluid mechanics, energy harvesting

Industry and Research Professors

Joseph Borowiec, Industry Professor

PhD, Polytechnic Institute of New York

Finite elements method, structural mechanics, design

Paolo Cappa, Research Professor and Professor Sapienza University of Rome, Italy

MS, Sapienza University of Rome

Biomedical Engineering

Sang-Hoon Lee, Industry Assistant Professor

PhD, Polytechnic University

Measurement systems and automatic control

Dung Luong, Industry Assistant Professor
PhD, Polytechnic Institute of NYU
Composite materials

Aristides Patrinos, Distinguished Industry Professor of Mechanical Engineering and Deputy Director of NYU-CUSP
PhD, Northwestern University
Environmental science and engineering, biomolecular science and engineering

Iskender Sahin, Industry Professor
PhD, Virginia Polytechnic Institute and State University
Thermal and fluid systems

Peter S. Walker, Research Professor of Mechanical Engineering and Research Professor of Orthopedic Surgery at New York University Hospital for Joint Diseases
PhD, University of Leeds
Orthopedics, minimally invasive surgery

Adjunct Faculty

Anthony Clarke
MS, Binghamton University
Finite Elements Methods

Nicholas Dizinno
MS, Polytechnic University
Computer-Aided Design, Thermal Sciences

Vladimir Kopman
PhD, Polytechnic Institute of NYU
Automatic Control

Kee M. Park
PhD, Stevens Institute of Technology
Machine design

Daniel Speyer
PhD, New York University
Nuclear Power Plant Systems

Paul Sutton
JD, Brooklyn Law School
Intellectual property, intersections of law, engineering and business

Ali Vedavarz
PhD, Polytechnic University
Energy systems, green energy, HVAC

Faculty Emeriti

Vito D. Agosta, Professor Emeritus
PhD, Columbia University

Anthony E. Armenakas, PE, Professor Emeritus
PhD, Columbia University

William B. Blesser, Professor Emeritus
MEE, Polytechnic Institute of Brooklyn

Irving B. Cadoff, Professor Emeritus
DEngSc, New York University

John R. Curreri, Professor Emeritus
MEE, Polytechnic Institute of Brooklyn

Carmine D'Antonio, Professor Emeritus
MMetE, Polytechnic Institute of Brooklyn

Jerome M. Klosner, PE, Professor Emeritus
PhD, Polytechnic Institute of Brooklyn

Harold Margolin, Professor Emeritus
DEngSc, Yale University

William R. McShane, PE, Professor Emeritus
PhD, Polytechnic Institute of New York

Gino Moretti, Professor Emeritus
PhD, University of Turin (Italy)

Sharad A. Patel, Professor Emeritus
PhD, Polytechnic Institute of Brooklyn

Bernard W. Shafer, PE, Professor Emeritus
PhD, Brown University

William P. Vafakos, PE, Professor Emeritus
PhD, Polytechnic Institute of Brooklyn
JD, Brooklyn Law School

DEPARTMENT OF TECHNOLOGY, CULTURE AND SOCIETY

Chair: Professor Jonathan Soffer

Mission Statement

The interdisciplinary Department of Technology, Culture and Society (TCS) promotes critical engagement with technology and science through research and teaching while drawing on humanities and social science perspectives. This mission is fulfilled in part by undergraduate degree programs, including [Integrated Digital Media, B.S.](#), [Science and Technology Studies, B.S.](#) and [Sustainable Urban Environments, B.S.](#), and by a graduate program in [Integrated Digital Media, M.S.](#) The department is also responsible for the School of Engineering's core curriculum in humanities and social sciences, which gives undergraduate students a breadth of knowledge and perspective necessary for careers in technology and the sciences.

Department: Undergrad Cluster Curriculum: Core Requirements

The Cluster Concept

TCS offers humanities and social sciences elective courses that examine the relations among science, technology and society from three general approaches and modes of inquiry: Culture, Arts and Media; Science, Technology and Society; and Society, Environment and Globalization (see below). This integrated approach to science, technology and the humanities and social sciences provides engineering and science majors with a concrete and focused foundation for their fields. The humanities and social sciences clusters are:

Culture, Arts and Media (CAM)

The CAM cluster explores how cultural practices and artifacts in a wide range of media reflect, influence and interact with developments in science and technology. Courses are based on philosophy, media studies, music, literary studies, art history, rhetoric and anthropology.

Science, Technology and Society (STS)

STS cluster courses explore the interrelationships among science, technology, culture and society. The questions posed include: How do science and technology shape society? How do social processes frame scientific and technological enterprises? What is the relationship between the content of scientific and technological knowledge and the social and intellectual context in which it is created?

Society, Environment and Globalization (SEG)

Courses in this cluster address how critical areas of society, environment and globalization affect the experience of contemporary life. Coming from the complementary perspectives of the humanities and social sciences, SEG courses provide students with a broad and multicultural perspective on how environmental issues and global exchange in this "flat world" are changing society, here and across the world.

Humanities and Social Sciences Elective Requirement (4 courses, 16 credits)

Students may choose 4 courses from any humanities and social sciences cluster. These 4 electives can be within a single cluster or across multiple clusters. The department encourages students to take [humanities and social sciences electives](#) across clusters and/or across disciplines within a cluster. These 4 humanities and social sciences electives must satisfy the following constraints:

- a. **At least one course must be a 3xxx/4xxx level humanities and social science elective.**
- b. **At least one course must be a writing-intensive humanities and social science elective, labeled by “W.”**

Course Types

TCS offers three types of undergraduate courses, as well as graduate courses:

Humanities and Social Sciences Electives are open to all Bachelor of Science students, subject to prerequisites. They count toward the school's general-education requirement and the state's Liberal Arts and Science requirement and help meet ABET requirements.

Writing-Intensive Humanities and Social Sciences Electives are writing-intensive humanities and social sciences courses designated with a “W” and open to all Bachelor of Science students, subject to prerequisites. Requirements for writing-intensive courses include:

- i. A minimum of 15 pages of formal writing, not including informal writing and in-class exams;
- ii. Explicit writing instruction;
- iii. At least one formal written assignment that incorporates instructor response and student revision;
- iv. As part of the writing-intensive course, students will learn to write a formal research paper related to the class topic.

Studio Electives are creative practice courses in art and design disciplines, open to all Bachelor of Science students, subject to prerequisites. These courses may NOT be taken as humanities and social sciences electives to satisfy general-education humanities and social sciences requirements, but may be taken as technical or free electives.

N.B.: Courses that carry the following prefix may NOT be used to fulfill the general humanities and social sciences requirements: DM (digital media).

Institutes Affiliated with the Department of Technology, Culture and Society

Brooklyn Experimental Media Garage (BxmC)

BXmC at NYU SOE is truly experimental; it is the creative/research arm of the School of Engineering's art and technology programs. BXmC works with the hard core of New York's experimental multimedia scene: installation and performing artists, programmers and interaction designers and architects. BXmC develops new kinds of partnerships to create new applications of digital media technologies, including web, sound, film, 3-D, games and others.

Contact Information

NYU Tandon School of Engineering
Six MetroTech Center
Brooklyn, NY 11201
Tel: (646) 997-3231

<http://engineering.nyu.edu/academics/departments/tcs>

Degrees Offered

Bachelor of Science

- [Integrated Digital Media, B.S.](#) based in the [Integrated Digital Media Program](#)
- [Science and Technology Studies, B.S.](#) based in the [Science and Technology Studies Program](#)
- [Sustainable Urban Environments, B.S.](#) based in the [Sustainable Urban Environments Program](#)

Master of Science

- [Integrated Digital Media, M.S.](#) offered by the [Integrated Digital Media Program](#)

Minors

[Integrated Digital Media](#)

Requirements: 15 credits of DM courses, of which 6 are at the 3xxx level or above.

[Science and Technology Studies](#)

The minor in STS requires 16 credits consisting of:

1. Core requirement: [STS-UY 3004/W](#) (4 credits).
2. Elective requirement: Remaining credit requirements (12 credits) must be satisfied by courses chosen from the STS electives list.

Requirement 1 and one of the STS electives (requirement 2) must be taken at SOE; the remaining elective requirements may be met with transfer credits.

[Sustainable Urban Environments](#)

The minor in SUE requires 16 credits consisting of at least two courses from the SUE core and three courses from any of those offered in the concentration. The minor in SUE is open to all majors.

Faculty

Professors

Kristen Day, Professor of Urban Planning and Department Head
PhD, University of Wisconsin, Milwaukee

Urban design and behavior; design of urban environments for equity, health and well-being

Jean Gallagher, Professor of English
PhD, City University of New York Graduate Center
Feminist theory, 19th- and 20th-century American literature, modern poetry

Sylvia Kasey Marks, Professor of English
PhD, Princeton University
Shakespeare, Samuel Richardson, the 18th- and 19th-century British novel, public speaking, expository writing

Jonathan Soffer, Professor of History and Department Chair
PhD, Columbia University
JD, University of Denver
Twentieth-century American political and foreign-relations history, urban history with a specialization in the history of New York City since 1945

Richard E. Wener, Professor of Environmental Psychology
PhD, University of Illinois at Chicago
Environmental psychology

Associate Professors

Jonathan Bain, Associate Professor of Philosophy of Science
PhD, University of Pittsburgh
Quantum theory, philosophy of space and time

Teresa Feroli, Associate Professor of English
PhD, Cornell University
Renaissance literature, Shakespeare, women's studies

Assistant Professor

Luke Dubois, Assistant Professor of Digital Media
PhD, Columbia University
Computer music, real-time multimedia

Industry Faculty

Harold P. Sjursen, Industry Professor of Philosophy
PhD, New School University
History of philosophy, ethics, philosophy of science and technology

De Angela Duff, Industry Professor of Integrated Digital Media
MFA, Maryland Institute College of Art
Web design, interaction design

Lecturer

Donald S. Phillips, Senior Lecturer in Natural History
BS, Polytechnic University
Physical anthropology, paleontology, natural disasters

Instructors

Allan Goldstein, Senior Lecturer in English

BA, University of Denver

Writing nonfiction/personal experience writing, disability studies

Dana Karwas, Instructor in Integrated Digital Media

MPS, New York University

Interaction design

Christopher Leslie, Lecturer in Science and Technology Studies

PhD, City University of New York Graduate Center

Media and technology, science of difference, science fiction

James P. Lewis, Lecturer in Psychology

MA, Stony Brook University

Humanistic psychology

Alan M. Nadler, Lecturer in English

MFA, Columbia University

Contemporary poetry, the European novel

Mark Skwarek, Lecturer in Integrated Digital Media

MFA, Rhode Island School of Design

Augmented reality

Faculty Emeriti

Lester Bumas

Duane DeVries

Anne Eisenberg

Helmut Gruber

Louis Menashe

David Mermelstein

F. David Mulcahy

Bernard Rechtschaffen

Thomas B. Settle

Romualdas Sviedrys

Humanities and Social Sciences Electives List

[Humanities and Social Sciences Electives List](#)

DEPARTMENT OF TECHNOLOGY MANAGEMENT AND INNOVATION

Head: Bharat Rao

Mission Statement

The mission of the Department of Technology Management is to act as a major educational gateway and premier learning and research hub devoted explicitly to broadly defined innovation and technology management and entrepreneurship. The scholarly intellectual capital it produces and its tailored programs at the undergraduate, graduate and doctoral levels enable the department to provide unique and valuable opportunities for students, practicing managers and scholars. The department is committed unequivocally to upgrade and revise continually its learning programs and courses to meet fast-changing demands of a dynamic, innovation-driven and competitive environment and to be an academic leader in technology management

The Department

Effective technology and innovation management and entrepreneurship increasingly determine success in business today. The Department of Technology Management is an acknowledged pioneer and leader in the New York City/tri-state region and beyond in offering courses and programs about these increasingly critical arenas. The department serves a diverse and broad range of professionals, and its faculty and students compose a vital and forward-thinking research and learning community. The department's research and educational offerings focus on a broad range of sectors, including financial and professional services; retailing and logistics; bio-medical, biotechnology and pharmaceuticals; renewable energy and clean technology; media and entertainment; IT, telecom, networks and modern electronic business; and non-for-profits and government-all constituting areas of greatest growth and opportunity in the modern economy, especially in New York City, the nation's foremost global city.

Contact Information

Brooklyn Campus

Polytechnic Institute of NYU Five MetroTech Center
Brooklyn, NY 11201
Tel: (718) 260-3760
Fax: (718) 260-3874
E-mail: mgt-dept@poly.edu
Web: <http://engineering.nyu.edu/academics/departments/technology>

Manhattan Location

MOT and IM Executive Master's Programs Institute for Technology and Enterprise
55 Broad Street, Suite 13B
New York, NY 10004
Tel: (718) 260-4015
Fax: (212) 547-7029

E-mail: mot-im@poly.edu; ite@poly.edu

Web: <http://engineering.nyu.edu/academics/programs/management-technology-ms>

Degrees Offered

Bachelor of Science

- [Business and Technology Management, B.S.](#) offered by the [Business and Technology Management Program](#)

Master of Science

- Information Management (eIM) offered by the Information Management Executive Master's (eIM) Program
- Management (MSM) - Concentrations: [Construction Management](#), [Electronic Business](#), [Entrepreneurship](#), [Human Resource Management](#), [Information Management and Telecommunications Management](#), [Project Management](#) and [Technology Management](#) offered by the [Master of Science in Management Program](#)
- [Management of Technology, M.S. \(MOT\)*](#) offered by the [Management of Technology Program](#)
- Organizational Behavior (MSOB) - Concentrations: [Human Resource Information Systems](#), [Human Resources Management](#), [Management of Change](#) and [Training and Development](#) offered by the [Organizational Behavior Program](#)

Doctor of Philosophy

- [Technology Management, Ph.D.](#) offered by the [Technology Management Program](#)

Graduate Certificates

- [Construction Management Advanced Certificate**](#)
- Electronic Business Management Advanced Certificate
- Entrepreneurship Advanced Certificate
- Human Resources Management Advanced Certificate
- Information Management Advanced Certificate
- Organizational Behavior Advanced Certificate
- Project Management Advanced Certificate
- Technology Management Advanced Certificate
- Telecommunications Management Advanced Certificate

*Offered in the MOT and eMOT Programs.

**Offered with the Department of Civil Engineering.

Research Profile

The Department of Technology Management consists of an interdisciplinary group of scholars that studies various aspects of technology and innovation - strategic, behavioral, organizational and sociological. Some specific streams of research and sub-topics include:

- Global innovation and R&D strategy - Managing emerging technologies - Technology and development - Service design and innovation - Tech entrepreneurship and commercialization - Sustainable and clean-tech innovation
- Impacts of information technology upon individuals, organizations and society - Citizen science - Social computing - Open source - Business model innovation - Pervasive information services
- Sociological aspects of technology and work - Communicative practices - Distributed collaboration and virtual teams - Knowledge management - Leading Distributed and Virtual Organizations - Project Management

Educational Programs

Undergraduate Program

The Department of Technology Management offers a [Bachelor of Science in Business and Technology Management \(BTM\)](#). This program prepares students to be next generation managers in fields dominated by technological innovation and especially the rapid advancement of information technology and other fields in the applied science and engineering disciplines. Students completing the BTM Program are prepared to succeed in positions such as technology project leaders, technology savvy entrepreneurs, technology and IT analysts, customer-relationship managers and in other cross-functional roles, and developers of business innovations in financial services and other professional services fields.

Minor in Management

Undergraduate students may obtain a [Management Minor](#) by completing 14 credits of undergraduate management courses. An overall GPA of at least 2.0 must be maintained. At least 8 of the 14 credits must be taken by students while enrolled at Polytechnic.

Graduate and Certificate Programs

The department offers a portfolio of redesigned and modernized educational programs, all dealing with the broad spectrum of innovation, technology management and entrepreneurship in the modern economy, and the department's graduate programs attract a wide range of students and professionals. This is because all managers should understand how technology and innovation management and entrepreneurship are essential for delivering value to organizations and to the market.

The department offers several graduate and professional programs, two of which are earned in executive management format (meeting every other week on Thursday evening and all day Saturday) and four of which are offered on weekday evenings. One program is offered in both formats.

The department's graduate and professional programs include:

Students may pursue the MOT, MSM and MS-OB programs either part time or full time with an evening schedule. Each has concentrations that allow students to specialize in selected areas.

The department also offers advanced graduate certificates from the MSM and MS-OB Programs, which consist of sequences of courses leading to advanced knowledge in a desired area of specialization.

Graduate Programs

We encourage and welcome prospective students to apply to our other thriving and innovative graduate programs: the Management of Technology (MOT) and Information Management (IM) Executive Master's programs, the Master's of Science-Management (MSM) and the Master's of Science-Organization Behavior (MS-OB). Further information on these programs can be found on the department's website.

Doctor of Philosophy in Technology Management

Modern technologies increasingly and profoundly affect the management of products, services, processes, organizational forms, business models, the shape of industry structures and modern business environments, the available kinds of technology-enabled innovation and the capability of integrating technology and management-all aimed at creating value for customers and organizations. The ability to conduct research on and to educate about the managerial implications of such topics- all composing technology management-is a highly sought-after and important arena for business scholarship and education. The PhD in Technology Management provides this increasingly significant set of scholarly and educational opportunities.

This [degree program](#) is for research-oriented students. Both full-time and part-time students are accepted. Admission criteria include academic record, professional experience, research potential, GMAT or GRE scores, references and a writing sample.

Please visit the program's website for more information.

All management undergraduate and graduate degree programs, as well as certificate programs, are further described in this catalog.

Student Professional Societies, Associations and Organizations

The Management of Technology and the Information Management Executive Programs Alumni Association actively seek to continue and expand shared professional experience gained during and after the programs. Members meet face to face or electronically to share insights obtained in their work experiences and to debate issues broadly relevant to technology management.

The Organizational Behavior Program sponsors an award-winning student chapter of the Society for Human Resources Management (SHRM). The PolySHRM chapter was selected as one of the top 10 in the country by national SHRM. PolySHRM sponsors forums with experts and provides opportunities for professional networking and mentoring to enhance a student's education and career.

The student club associated with the Bachelor of Science in Business and Technology Management degree program is a strong and valued component of the social fabric of undergraduate life at the School of Engineering. This organization works to create professional knowledge and opportunities for members.

Departmental representatives are available for student advising at SOE and at the 55 Broad Street, Manhattan Programs location.

Faculty

Professors

Harold G. Kaufman, Professor of Technology Management; Academic Director, Organizational Behavior Program;
Academic Director, Department of Management Extension in Israel MIE,
PhD, New York University
BME, Cooper Union for the Advancement of Science and Art
Managing professional and technical workers, career management, obsolescence of knowledge and skills, research methods

Associate Professor

Bharat P. Rao, Associate Professor of Technology Management and Department Chair
PhD, University of Georgia
Managing emerging technologies, broadband, wireless and digital business, global innovation, strategic marketing, IT in the supply chain, alliances, networks and collaborative enterprises

Oded Nov, Assistant Professor of Technology Management
PhD, University of Cambridge, UK,
MSC, London School of Economics, UK
Technology management, behavioral aspects of information systems, knowledge management, motivations of open source and user-generated content contributors

Assistant Professors

Anne-Laure Fayard, Assistant Professor of Technology Management
PhD, Ecole Des Hautes Etudes en Sciences Sociales (France)
Discourse analysis, communication, online communities, social-material practices, space and culture

Industry Faculty

Robert Albano, Industry Professor
MBA, Rutgers University

Michael Greenstein, Industry Professor, Director of Industrial and Manufacturing Engineering Master's Programs
MBA, The University of Louisville

Paul M. Horn, Distinguished Industry Professor
PhD, University of Rochester

Jerry MacArthur Hultin, Industry Professor of Law, Management and Public Policy; President of Polytechnic Institute of NYU
JD, Yale University
Innovation management, global development, modern university education, technology policy

Joseph S. Nadan, Industry Professor of Technology Management; Director of eMOT and eIM Master's Programs
PhD, New York University

Content innovation, social networks, global entrepreneurship, media management, wireless innovation, e-business

Professional Staff

[Bohdan Hoshovsky](#), MSM and BS-BTM Academic and Administrative Program Director
PhD, Pacifica Graduate Institute

Janelle Meehan, Program Coordinator
BA, Lycoming Collge

Vivek Veeraiah, Administrative Director Department of Technology Management and Innovation
and MS-MOT and MS-OB Programs
MS, MBS, New York University - Polytechnic School of Engineering

Adjunct Faculty

Frank Apicella
MBA, New York University
Finance

John Artise
MA, New York University
Global human resource management

Tushar Bhattacharjee
PhD, Post-Doctoral Research, MIT and Osaka University
Data communications, electrical engineering

Andrew Biga
PhD, University of South Florida
Talent management, human capital analytics

Robert Biolsi
PhD, Graduate Center, College University of New York
Finance, inflation, equity prices and commodity diversification, electricity deregulation

Jabril Bensedrine
PhD, ESSEC Graduate School of Business (France)
Entrepreneurship, corporate entrepreneurship, technology strategy

Ravi Bhatia
MS, Polytechnic Institute of New York
Project management

Denise Bracamonte
BA, St. John University; PMP and PMI
Certified Project management
Project management

Aurora Brito

MBA, Suffolk University
Coaching in organizations, organizational behavior

Vaughan Coleman

MSOB, Polytechnic University
MA, New York University
Eed, Columbia University
Knowledge Management in HR

Vincent Conte

PhD, Hofstra University
Globalization and technology in HR, Business processing re-engineering, Human capital engineering, Organization development

Alejandro Crawford

MBA, Tuck School, Dartmouth
Entrepreneurial marketing and sales, managing growing enterprises, marketing

Anthony Deak

MS, Polytechnic Institute of New York
Foundations of management, global perspectives in management

Matthew J. DeLuca

MPA, University of Pittsburgh
Conflict management, labor relations, performance management, reward systems, organizational consulting, outsourcing

Michael D'Emic

PhD, National University of Ireland, Cork
MBA, Trinity College (Dublin)
Accounting, finance

Philip Dorin

PhD, University of Connecticut
Training and development

Michael Driscoll

MBA, Polytechnic Institute of New York University
Global innovation, managing cloud computing

Roger D. Eisenhardt

MA, Public Administration, CW Post College
MS, Organizational Behavior, Polytechnic Institute of NYU
Human resource management, organizational behavior

James Fazio

MA and MBA, St. John's University
Operations management

Philip Ferrara

Adjunct Associate Professor of Management

PhD, Hofstra University

Organizational staffing, job design, employee engagement, job and workplace design

William Feuss

PhD, Stevens Institute of Technology

Marketing

Sara Grant

PhD, New York University

Organizational theory and design, research methods

Edward Greenbaum

MS, Cornell University

Industrial and labor relations

Bohdan Hoshovsky

PhD, Pacifica Graduate Institute

Organizational behavior, project management, general management, transhumanism

Jonatan Jelen

MBA, Ecole Supérieure de Commerce de Paris

PhD candidate, Baruch

Economics, supply chain management

David Kalow

JD, University of Chicago

Intellectual property

Zuño Kristal

EdD, Columbia University

Leadership, organizational learning, executive coaching

Howard Kupferman,

MS, Polytechnic Institute of New York

MBA, Finance, Fordham University

Organizational behavior, business ethics, human resource management, marketing

Rob Marano

MS, University of Pennsylvania

Entrepreneurship, engineering

Thomas Mazzone

MBA, Theseus Institute (France)

Operations management, supply chain management, project management

Marc S. Miller

MBA, Iona College

Human resource management, managing HR technology

Mark Mishken

PhD, University of Tennessee
Organizational staffing, organizational behavior

Pavlos Mourdoukoutas

PhD, University of Connecticut
Economics

Carl Nelson

MIE, New York University
Operations management

Bruce Niswander

JD, MBA, Ohio State University
Entrepreneurship, entrepreneurial finance, managing intellectual property and intellectual capital

James Paguagua

MBA, Pace University
New product development, marketing

John Reilly

MA, Columbia University
Human resource information systems, web-based human resource management, managing new technology in HR

Ron Spinelli

MS, Brooklyn Polytechnic University
Supply chain management, strategic business

Vivek Veeraiah

MS, MBA, Polytechnic Institute of NYU
Operations management, enterprise data systems

Carla Visser, Adjunct Associate Professor of Management

M.Ed, Rutgers University
Coaching in organizations

Jack Yurkiewicz

PhD, Yale University
Management science

Anthony Zinsser

PhD, Stevens Institute of Technology
Organizational behavior, organization development, talent management, leadership and team development

Yael Zofi

MA, Columbia University
Coaching in organizations, leadership and team development

Advisory Boards

Corporate and Academic

The Department of Technology Management maintains deep ties with a wide range of firms in a host of knowledge- and innovation-intensive sectors. The department is honored to have a distinguished and active Corporate Advisory Board. The department also works closely with high-quality academic institutions and colleagues worldwide and is honored to have an active and highly respected Academic Advisory Board. Both boards meet regularly to review the department's programs, research and plans. In this manner, the department stays informed, meets the pragmatic and scholarly needs and critical challenges confronting technology and innovation executives and entrepreneurs, and assures that its courses and programs are state of the art and relevant.

Corporate Advisory Board Members

Mark Chardack

Chief Financial Officer
LextraNet.com

Patrick S. Finn

Director, Northeast Market Development
CISCO Systems

Edward Fitzpatrick

First Deputy Controller
City of New York

John Gilbert

Executive Vice President, COO
Rudin Management Inc.
Chief Technology Officer
New York Information Technology Center

Dr. Alan Kantrow, PhD

Chief Content Officer, Monitor Group
Dean of Faculty, Monitor University, Monitor Group
Visiting Professor, Skolkovo Business School, Moscow

Stephen Lake

Investment Director
QinetiQ Ventures (UK)

Sean Phelan

Founder, Multimap (UK)
Private Investor

J. R. (Jay) Topper Jr.

CIO
Rosetta Stone

Academic Advisory Board

Professor Michael Cusumano

Sloan School of Management, MIT
Cambridge, Massachusetts

Professor Yves Doz

INSEAD
Fontainebleau, France

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Chief Content Officer, Monitor
GroupDean of Faculty, Monitor University, Monitor Group
Visiting Professor, Skolkovo Business School, Moscow

Professor Shlomo Maital

Technion Institute of Management
Tel Aviv, Israel

Professor Pedro Nueno

IESE
Barcelona, Spain

Professor Ananth Ramen

Harvard Business School

Professor Denis Fred Simon

Penn State University

Professor Edward A. Stohr

Stevens Institute of Technology

Professor Raymond-Alain Thietart

Director, PhD Program
ESSEC Business School, France

Professor N. Venkatraman McGrath

Boston University School of Management

ENTERPRISE LEARNING

NYU Tandon School of Engineering's Enterprise Learning meets the complex needs of large organizations worldwide, helping tie learning to company objectives. Whether organizations need to encourage technical leadership, or provide creative intelligence to run R&D centers, or introduce strategic ways to launch new tools and technologies, it can count on NYU Tandon Enterprise Learning to deliver what management and technical staffs need-wherever they are deployed-online, at company sites, or at NYU Tandon's campuses on every continent. Corporate learning and performance officers or training staff will recognize how these noncredit executive-education certificates meet strategic-learning objectives. For details, go to <http://engineering.nyu.edu/enterprise-learning>.

NYU TANDON ONLINE

NYU Tandon Online is the fully accredited Online Learning Unit of NYU Tandon School of Engineering. NYU Tandon Online provides global, flexible online education in engineering, science and technology to create industry experts who will impact the nation and the world. This is achieved by carrying on the NYU Tandon School of Engineering culture of Innovation, Invention, and Entrepreneurship. Armed with the tools, resources and inspiration, faculty and students can turn their research into concrete applications, products and services. The online community allows for world-wide collaboration, allowing even the most remote student to be an integral part of the NYU community. The degree earned and the education received is exactly the same as students receive by attending classes on campus.

GENERAL ENGINEERING

Goals and Objectives

A prime mission of the NYU School of Engineering's first-year college experience is to teach students how to learn. Students will be equipped for life in our rapidly changing world, where it is especially true in the science and engineering studies that education is a lifetime commitment. SOE's first-year curriculum emphasizes learning by doing through the repeated application of new concepts and skills in practical situations of increasing complexity and sophistication. Faculty leadership of learning by doing involves mentoring of individual students, exploring different learning styles, encouraging working in teams on real professional problems, and modeling what it means to be a superb professional and an involved citizen.

Required Courses

All first-year students, including transfer students with fewer than 6 credits, are required to enroll in EG-UY 1001, the Engineering and Technology Forum course. Students majoring in engineering and technology disciplines will also enroll in EG-UY 1003, a hands-on engineering analysis and design course in their first semester of study at the School of Engineering. In this course, students engage in relevant engineering design projects. Through active involvement and teamwork, students follow practices and approaches used in industry and research entities to solve real-world engineering problems.

Faculty

Industry Professors

Gunter Georgi, PE, Industry Professor, Director of General Engineering
ME, Columbia University
MSME, Columbia University
BSME, Cooper Union

Dimitri James Cordista, Industry Assistant Professor
BSIE, Polytechnic University

David Lefer, Industry Associate Professor, Director of the Engineering and Technology Forum
MS, Columbia University

Peter Li, Lecturer
BSCS, Polytechnic University

Jack Bringardner, Industry Assistant Professor
BSCE, The Ohio State University
MS, The University of Texas at Austin
PhD, The University of Texas at Austin

LIST OF ACADEMIC PROGRAMS AND CURRICULA

Non-Degree

- Aerospace Engineering Minor
- Applied Physics Minor
- Bioinformatics Advanced Certificate
- Biomolecular Science Minor
- Computer Engineering Minor
- Computer Science Minor
- Construction Management Minor
- Cybersecurity Minor
- Electrical Engineering Minor
- Finance Minor
- Game Engineering Minor
- Integrated Digital Media Minor
- Management Minor
- Mathematics Minor
- Mechanical Engineering Minor
- Nuclear Sciences and Engineering Concentration
- Nuclear Sciences and Engineering Interdisciplinary Minor
- Nuclear Sciences and Engineering Minor
- Science and Technology Studies Minor
- Sustainable Urban Environments Minor

Bachelor of Science

- Applied Physics, B.S.
- Biomolecular Science, Biomedical Science Option, B.S.
- Biomolecular Science, Biotechnology Option, B.S.
- Biomolecular Science, Chemistry Option, B.S.
- Business and Technology Management, B.S.
- Chemical and Biomolecular Engineering, B.S.
- Civil Engineering, B.S.
- Computer Engineering, B.S.
- Computer Science and Computer Engineering (dual major), B.S.
- Computer Science, B.S.
- Construction Management, B.S.
- Electrical Engineering and Computer Engineering (dual major), B.S.
- Electrical Engineering, B.S.
- Integrated Digital Media, B.S.
- Mathematics, B.S.
- Mechanical Engineering, Aerospace Minor, B.S.
- Mechanical Engineering, B.S.
- Physics and Mathematics, B.S.
- Science and Technology Studies, B.S.
- Sustainable Urban Environments, B.S.

Graduate Certificate

- Bioinformatics (Online) Advanced Certificate
- Construction Management Advanced Certificate
- Executive Construction Management (Exec 21) Advanced Certificate
- Project Management (Online) Advanced Certificate
- Traffic Engineering Advanced Certificate
- Transportation Management Advanced Certificate
- Transportation Planning Advanced Certificate

Master of Science

- Applied Physics, M.S.
- Bioinformatics (Online), M.S.
- Bioinformatics, M.S.
- Biomedical Engineering, Bioinstrumentation Track, M.S.
- Biomedical Engineering, Biomaterials Track, M.S.
- Biomedical Engineering, Medical Imaging Track, M.S.
- Biotechnology and Entrepreneurship, M.S.
- Biotechnology, M.S.
- Chemical Engineering, Guided Studies Option, M.S.
- Chemical Engineering, Thesis Option, M.S.
- Chemistry, M.S.
- Civil Engineering, M.S.
- Computer Engineering (Online), M.S.
- Computer Engineering, M.S.
- Computer Science, M.S.
- Construction Management, M.S.
- Cybersecurity (Online), M.S.
- Cybersecurity, M.S.
- Electrical Engineering (Online), M.S.
- Electrical Engineering, M.S.
- Environmental Engineering, M.S.
- Environmental Science, M.S.
- Financial Engineering, Computational Finance Track, M.S.
- Financial Engineering, Financial Markets and Corporate Finance Track, M.S.
- Financial Engineering, M.S.
- Financial Engineering, Risk Track, M.S.
- Financial Engineering, Technology and Algorithmic Finance Track, M.S.
- Industrial Engineering (Online), M.S.
- Industrial Engineering, M.S.
- Integrated Digital Media, M.S.
- Management (MSM), Construction Management Concentration, M.S.
- Management (MSM), Design Innovation Concentration, M.S.
- Management (MSM), Electronic Business Concentration, M.S.
- Management (MSM), Entrepreneurship Concentration, M.S.
- Management (MSM), Human Resource Management Concentration, M.S.

- Management (MSM), Industrial and Manufacturing Engineering Concentration, M.S.
- Management (MSM), Information Management and Telecommunications Management Concentration, M.S.
- Management (MSM), M.S.
- Management (MSM), Project Management Concentration, M.S.
- Management (MSM), Technology Management Concentration, M.S.
- Management of Technology (Online)
- Management of Technology, M.S.
- Manufacturing Engineering, M.S.
- Mathematics, Examination Option and Designated Subspecialty Option, M.S.
- Mathematics, Examination Option, M.S.
- Mathematics, Thesis Option, M.S.
- Mechanical Engineering, Controls and Dynamic Systems Specialty, M.S.
- Mechanical Engineering, Energy Engineering and Policy, M.S.
- Mechanical Engineering, Mechanics and Structural Systems Specialty, M.S.
- Mechatronics and Robotics, M.S.
- Organizational Behavior, Systems and Analytics, Human Capital Engineering & Analytics Concentration, M.S.
- Organizational Behavior, Systems and Analytics, Human Resource Information Systems Concentration, M.S.
- Organizational Behavior, Systems and Analytics, Human Resources Management Concentration, M.S.
- Organizational Behavior, Systems and Analytics, Management of Change Concentration, M.S.
- Organizational Behavior, Systems and Analytics, Training and Development Concentration, M.S.
- Translational Surface Engineering, M.S.
- Transportation Management, M.S.
- Transportation Planning and Engineering, M.S.
- Urban Infrastructure Systems, M.S.

Doctor of Philosophy

- Biomedical Engineering, Ph.D.
- Chemical Engineering, Ph.D.
- Civil Engineering, Ph.D.
- Computer Science, Ph.D.
- Electrical Engineering, Ph.D.
- Materials Chemistry, Ph.D.
- Mathematics, Ph.D.
- Mechanical Engineering, Ph.D.
- Technology Management, Ph.D.
- Transportation Planning and Engineering, Ph.D.

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AEROSPACE ENGINEERING MINOR

The Department of Mechanical and Aerospace Engineering offers a minor in Aerospace Engineering that consists of the following five courses, totaling 15 credits, which provide students with the foundation needed to pursue a career in the aerospace industry or graduate studies in the field:

Required Courses:

- [ME-UY 3213 Mechanics of Materials](#) 3 Credits
- [AE-UY 4603 Compressible Flow](#) 3 Credits
- [AE-UY 4613 Aerodynamics](#) 3 Credits
- [AE-UY 4633 Aerospace Propulsion](#) 3 Credits
- [AE-UY 4653 Aircraft Flight Mechanics](#) 3 Credits

Note:

Students pursuing the BS in Mechanical engineering degree may complete the aerospace engineering minor by taking the four AE designated course in place of three ME and one Free Elective available in the program.

Contact Information:

Departmental Adviser: Joseph Borowiec

borowiec@nyu.edu

APPLIED PHYSICS MINOR

The Applied Physics Department offers a Minor in Applied Physics which consists of a set of 4 or more physics courses totaling at least 15 credits. The courses should be at the intermediate or advanced level (i.e. any course listed after PH-UY 2033) and have the introductory physics sequence* as prerequisites. You must also earn an overall GPA of 2.0 in these courses to receive the minor. Transfer students must earn at least 8 credits with a 2.0 GPA at the School of Engineering.

*[PH-UY 1013](#), [PH-UY 2023](#), [PH-UY 2033](#), [PH-UY 2121](#), and [PH-UY 2131](#).

Contact Information:

Departmental Adviser: Lorcan Folan

folan@nyu.edu

BIOINFORMATICS ADVANCED CERTIFICATE

Emerging from unprecedented investigations into biological phenomena over the last decades, the in-demand field of bioinformatics organizes and translates vast streams of data from living organisms generated by the Human Genome Project and other more recent studies. If you are seeking a role as an expert in bioinformatics, you need a thorough appreciation of biology, chemistry, and computer science. This online graduate certificate prepares you to join a talented cadre of creative specialists in the fast-paced pharmaceutical and biotechnology industries.

This program is also offered [online](#).

Curriculum

4 Required Courses (12 Credits)

Required Core Courses (9 credits)

- [BI-GY 7533 Bioinformatics I: Sequence Analysis](#) 3 Credits
- [BI-GY 7643 Computational Tools: Perl & Bioperl](#) 3 Credits
- [BI-GY 7653 Next Generation Sequence Analysis](#) 3 Credits

Elective Courses (3 credits)

Please choose 1 elective.

- [BI-GY 7543 Bioinformatics II: Protein Structure](#) 3 Credits
- [BI-GY 7633 Microarray Analysis](#) 3 Credits
- [CS-GY 6083 Principles of Database Systems](#) 3 Credits

BIOMOLECULAR SCIENCE MINOR

Students may obtain a minor in Biomolecular Science by taking 15 credits of BMS or CM courses chosen in consultation with a BMS advisor, not including those courses required by their major. At least 8 of the 15 credits must be taken at the NYU Tandon School of Engineering.

Contact Information

Departmental Advisers: Tommy Lee, Alexandra Seidenstein, Evgeny Vulfson, Bruce Garetz

Emails: tommy.lee@nyu.edu, ahs342@nyu.edu, ev494@nyu.edu, bgaretz@nyu.edu

COMPUTER ENGINEERING MINOR

Required Courses

Students may obtain a minor in Computer engineering by taking the following courses.

- [EE-UY 2013 Fundamentals of Electric Circuits I](#) 3 Credits
- [EE-UY 2024 Fundamentals of Electric Circuits II](#) 4 Credits
- [CS-UY 2204 Digital Logic and State Machine Design](#) 4 Credits
- [EE-UY 4144 Introduction to Embedded Systems Design](#) 4 Credits

Total credits: 15

Note:

For students not earning the BS degree in computer science, [EE-UY 4144](#) may be replaced by [CS-UY 2214](#) Computer Architecture. A GPA of 2.0 or better in the entire minor is required. Students must take a minimum of 8 credits at the School of Engineering. Students for whom [CS-UY 1133/CS-UY 1114](#) is not required for major should note that [CS-UY 1133/CS-UY 1114](#) is a prerequisite for [CS-UY 2204](#). The minor in computer engineering is not open to students earning the BS degree in electrical engineering.

Contact Information:

Departmental Adviser: Ellen Daniels
etd235@nyu.edu

COMPUTER SCIENCE MINOR

The minor in Computer Science consists of a minimum of 15 credits including [CS-UY 1134](#) and CS-UY 2124.¹ Students must obtain a grade of C- or better in [CS-UY 1114](#) (Intro. to Programming and Problem Solving) or a grade of A- or better in [CS-UY 1133](#) or permission of the department and satisfy the pre-requisite requirements before enrolling in these courses.²

Students must maintain an average of 2.0 or better in the entire minor. In addition, a required CS course in a BS curriculum cannot be used to satisfy the course requirements in the CS minor. For transfer students, a least three of the five courses must be taken at the NYU Tandon School of Engineering.

For more information about the minor, contact the Computer Science Department's undergraduate academic adviser.

¹ Students who entered NYU Tandon prior to FA16 may take [CS-UY 1124 Object Oriented Programming](#) and [CS-UY 2134 Data Structures and Algorithms](#) instead of CS-UY 1134 and CS-UY 2124.

² CS-UY 1114 and CS-UY 1133 do not count toward the minor requirements.

CONSTRUCTION MANAGEMENT MINOR

Much of what is designed by civil engineers is intended to be built or constructed in some manner. The goals of the minor are to teach fundamental technical and leadership skills and promote a greater understanding of relationships among construction and the other professions to students from the various engineering disciplines and other majors who may in some way become involved in the planning, construction, maintenance or operation of built systems. For this reason, the minor is open to any courses within the undergraduate Construction Management program (subject to the within described credit and course prerequisites), and it will allow students to select courses that best fit their interests and complement their curricula.

A basic understanding of construction is necessary to take full advantage of the courses in the Construction Management curriculum. [CE-UY 1502](#) Leadership and Foundations of Construction Management (formerly CE 1504) is the first major course in the Construction Management curriculum and serves as the introduction to major course for the program. [CE-UY 1502](#) is a prerequisite to all other undergraduate Construction Management courses, except [CE-UY 4533](#) Construction Law. This prerequisite can also be satisfied by an appropriate introduction to major course in another curriculum, such as [CE-UY 1002](#) Introduction to Civil Engineering. The determination as to whether any other course may satisfy this prerequisite is subject to the evaluation and approval of the Construction Management Program Director. In addition, students who have taken [CE-UY 1002](#) (or its predecessor course) or another acceptable prerequisite may take [CE-UY 1502](#) (or have taken its predecessor course) with the approval of the Construction Management Program Director in satisfaction of the minor requirement; however, students may not count more than one introduction to major course taken after the first year enrolled toward the required number of credits for graduation. All other prerequisites shall be as stated in the Bulletin.

The individual courses taken to fulfill the requirements of the minor each may be 1, 2, 3 or 4 credits. Students must earn a passing grade in not less than five courses and not less than 14 credits.

Contact Information:

Departmental Adviser: Lawrence Chiarelli

lchiarelli@nyu.edu

CYBERSECURITY MINOR

Overview:

Interested in understanding how systems can be hacked? Interested in understanding how systems can be designed to prevent them from being hacked? Want to understand how the latest reflection attack exploits have taken down entire systems? Want to learn the right areas of Computer Security to help you have relevant and useful skills for entering a growing field of industry? This minor may be of interest to you.

The CSE Department has been designated as a Center for Excellence in Cybersecurity Education and Research by the NSA and has an active cadre of students specializing in Cybersecurity, some of whom are supported by the NSF through its Scholarships for Service program. The minor program focuses on the technical aspects of security systems and is geared for those who are enrolled in a technical program in Computer Science or a related field. It covers, at a detailed level, technology that is used to detect security violations, technology that is used to build security appliances, and technology that is used to secure applications.

The program is unique within the NYU academic community and will be of interest to many students majoring in the NYU Tandon School of Engineering's BS programs in Computer Science and Computer Engineering. It may also be appealing to some students in the CAS BA program in Computer Science or related programs.

Students taking the minor must complete several prerequisite NYU Tandon School of Engineering Math and Computer Science courses (or similar courses offered by Courant). The minor requirements then comprise five security related courses. Students may count CS / EE courses in the minor as CS / EE electives in the BS degree programs in Computer Science and Computer Engineering.

Cybersecurity is focused on the technical aspects of security systems and geared for those who are enrolled in a technical program in Computer Science or related field. It covers at a detailed level technology that is used to detect security violations, technology that is used to build security appliances and technology that is used to secure applications. This minor is geared towards students who want to work in a technical field of security such as penetration testing or developing secure applications or who plan to go onto graduate education in security. Inquiries should be directed to the coordinator of academic advising, [Susana Garcia-Henriquez](#).

Cybersecurity Minor (15 credits):

Prerequisites:

Students will be expected to complete a minimal core curriculum (knowledge of programming, data structures, discrete math, and some computer architecture) in the CS undergraduate program, before enrolling in this minor, in order to be well prepared for the security coursework. Students who would like to pursue this minor who are not also CS majors will have to complete these courses (or show equivalent mastery) in addition to the minor requirements. The typical pathway through the prerequisite chain for NYU Tandon School of Engineering students will include the following five courses:

[CS-UY 1114 Introduction to Programming and Problem Solving](#)

[CS-UY 1134 Data Structures and Algorithms*](#)

[CS-UY 2124 Object Oriented Programming*](#)

***Note:** *Students who entered NYU Tandon prior to FA16 may take [CS-UY 1124 Object Oriented Programming](#) and [CS-UY 2134 Data Structures and Algorithms](#) instead of CS-UY 1134 and CS-UY 2124.*

[MA-UY 2314 Discrete Mathematics](#)

[CS-UY 2214 Computer Architecture and Organization](#)

NYU Tandon School of Engineering Computer Science or Computer Engineering majors can take [CS-UY 3224 Operating Systems](#) as a co-requisite with [CS-UY 3923 Computer Security](#).

Alternatively, students may satisfy most of the pre-requisites with courses in the College of Arts and Sciences:

CSCI-UA.0002 or placement exam

CSCI-UA.0101 (Introduction to Computer Science)

CSCI-UA.0102 (Data Structures)

CSCI-UA.0201 Computer Systems Organization)

MATH-UA.0120 (Discrete Mathematics).

These prerequisites can be completed by the fourth or fifth semester, leaving 3-4 semesters to complete the minor. Some courses require other security courses as prerequisites. Students should be sure to fulfill all necessary course requirements.

Cybersecurity Minor Courses:

This minor consists of 15 credit units: four required 3-credit courses and one 3-credit elective.

Cybersecurity Minor Required Core (12 credits):

- [CS-UY 3923 Computer Security](#) 3 Credits
- [CS-UY 3933 Network Security](#) 3 Credits
- [CS-UY 4753 Application Security](#) 3 Credits
- [CS-UY 4793 Computer Networking](#) 3 Credits OR [EE-UY 136 Communication Networks](#)

Cybersecurity Minor Electives (6 Credits):

In addition to these three core courses, students must take 6 additional credits from the following security courses from the NYU Tandon School of Engineering CS curriculum and from university-wide electives. Course options include:

NYU Tandon SOE Security Courses

- [CS-UY 4763 Information Systems Security Engineering and Management](#) 3 Credits
- [CS-UY 4773 Penetration Testing and Vulnerability Analysis](#) 3 Credits
- [CS-UY 4783 Applied Cryptography](#) 3 Credits

- EL-GY 9423 Computer Electronic Devices and System: Intro to Hardware Security & Trust 3 Credits

University-wide Electives:

Students may take a security related elective from outside the NYU Tandon School of Engineering with permission of the program director. Students who are doing a security related senior design project may use this as one elective in the Cybersecurity minor.

Suggested Sequence of Courses:

Computer Security ([CS-UY 3923](#)) can be taken at the same time as *Operating Systems* (5th semester of study for students entering CS BS program without advanced placement). *Computer Security* is a prerequisite for *Application Security* ([CS-UY 4753](#)). *Computer Networking* ([CS-UY 4793](#)) can be taken as early as the 4th semester, once the student has completed *Data Structures & Algorithms* ([CS-UY 2134](#)) and *Object-Oriented Programming* (CS-UY 2124). *Computer Networking* is a prerequisite for *Network Security* ([CS-UY 3933](#)), which, in turn, is a prerequisite for certain, more advanced electives. Students are advised to take these core courses during the junior year and/or first semester of the senior year, and then to take remaining security electives during the senior year.

CAS students who plan to take the cybersecurity minor should be aware that the minor will require them to take at least four courses (12 credits) at the NYU Tandon School of Engineering and that there is a limit (four courses or 16 credits) on the number of courses they may take outside of CAS. Thus, they must plan their programs carefully.

ELECTRICAL ENGINEERING MINOR

Students may obtain a minor in electrical engineering by taking 15 credits of EE prefixed courses. The courses may be any EE courses subject only to the prerequisite requirements. A grade of C- or better is required in [EE-UY 2013](#) and [EE-UY 2024](#) and a GPA of 2.0 or better in the entire minor is required.

A minimum of 8 credits in the minor must be taken at the School of Engineering. The Electrical Engineering minor is not open to Computer Engineering students.

Contact Information:

Departmental Adviser: Ellen Daniels
etd235@nyu.edu

FINANCE MINOR

The Department of Finance and Risk Engineering offers an Undergraduate Minor in Finance. The intent of this program of study is to allow NYU School of Engineering undergraduate students in the sciences and engineering to leverage their mathematical talents in a selected number of appropriate courses. This minor is also open to other NYU students with sufficient mathematic preparedness.

For more information on the Finance Minor, visit:

<http://engineering.nyu.edu/academics/departments/finance/minor>

You may apply for a minor, or any minor, in Albert in the My Academics section of the Student Center.

Contact Information:

Departmental Adviser: Professor Barry Blecherman
bsb279@nyu.edu

GAME ENGINEERING MINOR

Introduction

With the increased use of mobile and tablet devices, the global video game market, valued at \$78 Billion in 2012*, is experiencing unprecedented growth. Game designers and programmers are in higher demand than ever. As the industry grows and develops, so does our commitment to giving our students full access to the technology and leading information necessary for them to dive headfirst into this exciting area. Imagine working with cutting-edge technology to create one of the world's newest and most popular forms of entertainment. Our Game Engineering Minor gives you that opportunity.

Research at the Game Innovation Lab

The NYU Tandon School of Engineering's Game Innovation Lab provides a dynamic and engaging environment for faculty and the students they mentor to conduct innovative interdisciplinary research on the technical/engineering/science side of games and simulations. Working with industry partners and research facilities internationally, the lab provides opportunities for graduate students (and a handful of advanced undergraduates) who aspire to challenge convention and break barriers within the industry. Sample projects include games with advanced user interface techniques (a surveillance camera-enabled public game, an award-winning smart-phone-based dance battle game), automatic rigging of 3D models, research on games for learning, and playful interfaces for security and authentication purposes.

Prerequisites

Students are required to complete a minimal core curriculum in Computer Science (CS) before enrolling in the minor (or demonstrate equivalent mastery), in order to be well prepared for the game engineering coursework, as well as a Calculus course. Students completing the minor from outside of the NYU Tandon School of Engineering CS major program can request permission to apply a portion of these prerequisite credits to the overall credit total for the minor. At most six credits of the following courses may be applied to the minor (substituting for the University-wide elective and one of the core electives), provided they or an equivalent course **are not required** as part of the students major.

- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits
- [CS-UY 1124 Object Oriented Programming](#) 4 Credits
- [CS-UY 2134 Data Structures and Algorithms](#) 4 Credits

Curriculum

The Game Engineering Minor emphasizes mastery of computer programming skills relevant to Game Engineering, combined with hands-on practice building games with other in studio-style courses, and electives drawn from NYU's broad offerings in the games domain. Students are also expected to complete a prerequisite core curriculum in Computer Science (CS) to be well prepared for the other courses (or to demonstrate equivalent mastery).

Course Distribution

The minor consists of 15 credits. Each course taken may fulfill *either* a core *or* an elective requirement.

Core Course:

- [CS-UY 3113 Game Programming](#) 3 Credits (all students are required to take this course)

Studio Requirement: (choose 1)

- [CS-UY 3233 Game Development Studio I](#) 3 Credits
- [CS-UY 4553 Game Design](#) 3 Credits
- OART-UT 1612 Game Development 3 Credits ([Tisch School of the Arts Game Center](#))

Core Electives: (choose 2)

Students must take two additional game engineering courses within the NYU Tandon School of Engineering CS curriculum (or equivalent courses from other NYU departments - approval required).

- [CS-UY 4533 Interactive Computer Graphics](#) 3 Credits
- [CS-UY 4543 Human Computer Interaction](#) 3 Credits
- [CS-UY 4553 Game Design](#) 3 Credits
- [CS-UY 4613 Artificial Intelligence](#) 3 Credits

University-wide Electives: (choose 1)

Students may take an additional Core Elective, or submit another Game Engineering-related elective for approval by the Director of the Game Engineering Minor as part of their minor. The Director of the Game Engineering Minor will maintain a list of currently approved electives. Here is a *sample* of relevant NYU-wide electives:

- 3D Graphics Studio I in NYU Engineering's Digital Media program 3 *Credits*
- Introduction to Game Design, Game Development Project Studio, and Games 101 in the Tisch School of the Arts Game Center 3 *Credits*
- Designing Simulations and Games for Learning in the Steinhardt Digital Media and Design for Learning program 3 *Credits*
- Social Multiplayer Games and Computer Games in the Courant Institute Computer Science Department 3 *Credits*

INTEGRATED DIGITAL MEDIA MINOR

The minor in Integrated Digital Media is intended for students interested in developing their knowledge and practical skills in and around digital media production technology. As with the BS degree in Integrated Digital Media, courses provide theoretical context and also teach hands-on production expertise in various areas, such as digital filmmaking, web design, 3D graphics, game design, and digital audio. This minor is valuable for students who want to seize their own means of production in their primary fields, allowing them to design, create, and publish media content within the intellectual context of digital media in the 21st century.

Structure of the Minor

The IDM minor requires a minimum of 15 credits in DM classes:

- 3 credits in Audio or Visual Foundation Studio
- 12 credits of DM courses at the 1/2/3/4XXX level

Minor Coursework

- [DM-UY 1113 Audio Foundation Studio](#) 3 *Credits*
- [DM-UY 1123 Visual Foundation Studio](#) 3 *Credits*
- [DM-UY 1133 Creative Coding](#) 3 *Credits*
- [DM-UY 1143 Ideation & Prototyping](#) 3 *Credits*
- [DM-UY 2113 Sound Design for Media](#) 3 *Credits*
- [DM-UY 2123 Narrative Cinema](#) 3 *Credits*
- [DM-UY 2133 3D Modeling](#) 3 *Credits*
- [DM-UY 2143 Interaction Design Studio](#) 3 *Credits*
- [DM-UY 2153 Intro to Game Development](#) 3 *Credits*
- [DM-UY 2213 User Experience Design \(UX\)](#) 3 *Credits*
- [DM-UY 2263 Still and Moving Images](#) 3 *Credits*
- [DM-UY 2173 Motion Graphics Studio](#) 3 *Credits*

- [DM-UY 2183 Contemporary Techniques in Digital Photography and Imaging](#) 3 Credits
- [DM-UY 2193 Intro to Web Development](#) 3 Credits
- [DM-UY 3113 Contemporary Techniques in Sound Art](#) 3 Credits
- [DM-UY 3123 Documentary Cinema](#) 3 Credits
- [DM-UY 3133 3D Animation](#) 3 Credits
- [DM-UY 3153 Media in Game Design and Development](#) 3 Credits
- [DM-UY 3183 Photography and Words](#) 3 Credits
- [DM-UY 3193 Dynamic Web Applications](#) 3 Credits
- [DM-UY 4123 Experimental Cinema](#) 3 Credits
- [DM-UY 4133 3D for Interactive Applications](#) 3 Credits
- [DM-UY 4153 Experimental Game Narratives](#) 3 Credits
- [DM-UY 4173 Professional Practices](#) 3 Credits
- [DM-UY 4193 Mobile Application Development](#) 3 Credits

Contact Information:

Departmental Adviser: Eric Maiello

eric.maiello@nyu.edu

MANAGEMENT MINOR

Students may obtain an undergraduate minor in management by completing 14 credits of undergraduate (MG) management courses, which must include [MG-UY 1002 Foundations of Management](#). An overall GPA of at least 2.0 must be maintained in these classes. At least 8 of the 14 credits must be taken by students while enrolled at the School of Engineering.

For more information, please reference the [BSBTM Program](#).

Contact Information:

Departmental Adviser: Bohdan Hoshovsky

bh863@nyu.edu

MATHEMATICS MINOR

Students may obtain a minor in mathematics by taking 15 credits of mathematics courses. 8 credits of which are in addition to the major department's requirement in mathematics and must include two courses in Real Analysis. At least 6 of these 8 credits must be taken by students while enrolled at the NYU Tandon School of Engineering.

MECHANICAL ENGINEERING MINOR

The Minor requires students to take a total of 15 credits in Mechanical Engineering courses. Nine of these credits are in three core courses (selected from a list of four courses), while another six credits of two elective courses come from a list of six courses as shown below. If the student has taken some of the required or elective courses (or their equivalent) as part of their degree program, the student has to take additional courses in ME so that the total number of ME courses taken totals 15 credits.

Core Courses (choose three out of the listed four):

- [ME-UY 2213 Statics](#) 3 Credits
- [ME-UY 3333 Thermodynamics](#) 3 Credits
- [ME-UY 3223 Dynamics](#) 3 Credits
- [ME-UY 2813 Introduction to Materials Science](#) 3 Credits

Elective Courses (choose two out of the listed six):

- [ME-UY 3213 Mechanics of Materials](#) 3 Credits
- [ME-UY 3233 Machine Design](#) 3 Credits
- [ME-UY 3313 Fluid Mechanics](#) 3 Credits
- [ME-UY 3413 Automatic Control](#) 3 Credits
- [ME-UY 3513 Measurement Systems](#) 3 Credits
- [ME-UY 4313 Heat Transfer](#) 3 Credits

Contact Information:

Departmental Adviser: Joseph Borowiec

borowiec@nyu.edu

NUCLEAR SCIENCES AND ENGINEERING CONCENTRATION

Concentration and Minor in Nuclear Science and Engineering

This interdisciplinary program aims to produce engineering and science graduates who understand clearly the benefits and risks of nuclear technologies and who will seriously consider employment in nuclear industry and government.

Students may obtain an Interdisciplinary Concentration or Minor in Nuclear Science and Engineering, in conjunction with a traditional degree. Those majors include civil, chemical and biological, computer, electrical, financial and risk, or mechanical engineering, or the physical or computational sciences (all are majors currently offered by the NYU Tandon School of Engineering).

Concentration in Nuclear Science and Engineering

The concentration consists of three courses taken typically during the junior and senior years. Students can use the available technical and free electives in their curriculum to take these courses.

- [PH-UY 3103 Fundamentals of Applied Nuclear Physics](#) 3 Credits
- [PH-UY 3503 Introduction to Radiation Physics and Dosimetry](#) 3 Credits
- [ME-UY 4373 Introduction to Nuclear Engineering](#) 3 Credits

NUCLEAR SCIENCES AND ENGINEERING INTERDISCIPLINARY MINOR

The Department of Mechanical and Aerospace Engineering, in collaboration with the Department of Applied Physics, offers a minor an Interdisciplinary Minor in Nuclear Sciences and Engineering that consists of the following five courses, totaling 15 credits, that provide students with the foundation needed to pursue a career in the nuclear sciences and engineering industries or graduate studies in the field:

Course Requirements:

Please refer to the [Nuclear Sciences and Engineering Minor](#) page for course requirements.

Note:

Students pursuing the BS in Mechanical Engineering degree may complete the Interdisciplinary Minor in Nuclear Sciences and Engineering by taking the five courses as appropriate replacements for ME, Free, and/or Humanities electives. Please note that [ME-UY 4383](#) is cross-listed with [PH-UY 3503](#) and students are allowed to take either course. The two courses are identical, therefore [PH-UY 3503](#) can count as an ME elective.

Contact Information:

Departmental Adviser: Joseph Borowiec

borowiec@nyu.edu

NUCLEAR SCIENCES AND ENGINEERING MINOR

Concentration and Minor in Nuclear Science and Engineering

This interdisciplinary program aims to produce engineering and science graduates who understand clearly the benefits and risks of nuclear technologies and who will seriously consider employment in nuclear industry and government.

Students may obtain an Interdisciplinary Concentration or Minor in Nuclear Science and Engineering, in conjunction with a traditional degree. Those majors include civil, chemical and biological, computer, electrical, financial and risk, or mechanical engineering, or the physical or computational sciences (all are majors currently offered by the NYU Tandon School of Engineering).

Minor in Nuclear Science and Engineering

The core of the minor is the three course concentration.

- [PH-UY 3103 Fundamentals of Applied Nuclear Physics](#) 3 Credits
- [PH-UY 3503 Introduction to Radiation Physics and Dosimetry](#) 3 Credits
- [ME-UY 4373 Introduction to Nuclear Engineering](#) 3 Credits

Electives

The balance of the 15 credits required for the minor shall be selected from the approved elective courses listed below.

Approved elective courses include:

- [EE-UY 2613 Fundamentals of Electric Power Engineering for Non EE Students](#) 3Credits
- [PS-UY 2724 Human Factors in Engineering Design](#) 4 Credits
- [PH-UY 3513 Nuclear and Radiation Instrumentation and Methods](#) 3 Credits
- [RSK-UY 3593 Probabilistic Risk Assessment](#) 3 Credits
- [ME-UY 4393 Nuclear Power Plant Systems](#) 3 Credits
- [ME-UY 4863 Corrosion and Non-Destructive Evaluation of Materials](#) 3 Credits

Note:

An overall GPA of 2.0 is required in the courses to earn the minor.

Contact Information:

Departmental Adviser: Lorcan Folan

folan@nyu.edu

SCIENCE AND TECHNOLOGY STUDIES MINOR

The STS minor is open to all NYU majors. It includes 16 credits in STS. One of the core courses in STS must be taken at Tandon.

1. Core Requirement:

- Either
- [STS-UY 2004 Science, Technology, and Society](#) 4 Credits
- or
- [STS-UY 3004/W Seminar in Science and Technology Studies](#) 4 Credits

2. Elective Requirements:

Remaining credit requirements (12 credits) must be satisfied by courses chosen from the STS Cluster of electives from the Department of Technology, Culture and Society department or by approval by the STS advisor. At least one course must be taken at Tandon.

Contact Information:

Departmental Adviser: James Lewis

jpl366@nyu.edu

SUSTAINABLE URBAN ENVIRONMENTS MINOR

The program in Sustainable Urban Environments (SUE) prepares students to join scholars, policymakers, and other professionals as they work to create sustainable urban areas. The SUE program combines the liberal arts and technology, to ensure that students are conversant with both the contemporary technical and social problems of sustainability that face cities. Students in the minor can take courses in sustainable cities, urban policy, and city design, as well as courses in civil engineering and infrastructure planning. This minor is open to all NYU majors. Students seeking a minor in SUE must complete at least 16 credits of courses in the program, as described below:

SUE Core Courses

At least two courses from the SUE Core:

- [URB-UY 2054/W Introduction to Urban Policy](#) 4 Credits
- [HI-UY 3034/W History of New York's Urban Infrastructure](#) 4 Credits
- [URB-UY 2024/W Design of Cities](#) 4 Credits
- [URB-UY 2044 Methods for Studying Urban Environments](#) 4 Credits

Remaining Credits

The remaining credits can be from other SUE core courses listed above or any other course with a URB-UY designation.

Contact Information:

Departmental Adviser: James Lewis

jpl366@nyu.edu

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Applied Physics, BS

Bachelor of Science in Applied Physics

The aim of the four-year Bachelor of Science in Applied Physics is to prepare students thoroughly for any one of the many careers based on a concentration in physics. For some students, this means preparation for graduate school and further study leading to the master's or doctoral degree. For many others, it means professional work in industry, government or in high school teaching. Some students use their major in applied physics to prepare for work in mathematics, chemistry, biology, medicine, engineering, law, history of science, writing or business. The program's emphasis on fundamental knowledge, thorough analytic training and the universal logic of science enables applied physics students to take these different career paths. Students must complete 128 credits, as defined below, to graduate from the School of Engineering with a Bachelor of Science in Applied Physics. Please note that the curriculum that follows applies to students who begin classes in the Fall of 2014 or later. For students who enter the School of Engineering prior to that date, please review the curriculum and typical course schedule for students entering prior to Fall 2014.

The core of the program is 37 credits of required physics courses. Students begin with a general, calculus-based introductory sequence, followed by an introduction to Modern Physics, then intermediate courses in the fundamentals, i.e., Classical Mechanics, Electromagnetism, Thermal Physics and Statistical Mechanics and Quantum Physics. Students are provided with a solid grounding in mathematics and in the humanities and social sciences, and the choice to round out their education with two free electives. Students select the balance of their major courses from available elective physics offerings. Technical electives from other disciplines may be substituted with adviser approval, especially if a student is pursuing a concentration or minor.

Core Physics Requirements: 37 Credits

- [PH-UY 1002 Physics: The Genesis of Technology](#) 2 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2104 Analytical Mechanics](#) 4 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [PH-UY 2344 Introduction to Modern and Solid State Physics](#) 4 Credits
- [PH-UY 3002 Junior Physics Laboratory](#) 2 Credits
- [PH-UY 3234 Electricity and Magnetism](#) 4 Credits
- [PH-UY 4124 Thermodynamics and Statistical Physics](#) 4 Credits
- [PH-UY 4364 Introduction to the Quantum Theory](#) 4 Credits
- [PH-UY 4912 Senior Seminar in Physics](#) 2 Credits

Other Required Courses: 40 Credits

- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
and
- [BMS-UY 1004 Introduction to Cell and Molecular Biology](#) 4 Credits
or
- [CM-UY 1014 General Chemistry I](#) 4 Credits

and

- [CM-UY 1024 General Chemistry II](#) 4 Credits
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [MA-UY 2224 Data Analysis](#) 4 Credits

Physics and Math Electives: 23 Credits

Students should select five applied physics elective courses totaling at least 16 credits, and two math elective courses totaling at least 7 credits. Electives from other disciplines may be substituted with adviser approval.

Electives in the Humanities and Social Sciences: 16 Credits

Students are required to take 16 elective credits in the humanities and social sciences, requiring [EXPOS-UA 1](#) and [EXPOS-UA 2](#) as prerequisites. To gain some breadth of knowledge, it is required that students take courses in at least two disciplines and at least one course at an advanced level.

Free Electives, Independent Study and Projects: 12 Credits

Twelve credits are reserved for free electives and independent study courses, of which 6 credits are recommended for use on a project or thesis topic.

An illustrative typical course of study for the Bachelor of Science degree in applied physics is shown at the end of this section.

Typical Course of Study for the Bachelor of Science in Applied Physics

Freshman Year

Fall Semester: 15 Credits

- [PH-UY 1002 Physics: The Genesis of Technology](#) 2 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits¹

or

- [CM-UY 1014 General Chemistry I](#) 4 Credits ¹
- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits

Spring Semester: 15 Credits

- [PH-UY 1013 Mechanics](#) 3 Credits
 - [CM-UY 1024 General Chemistry II](#) 4 Credits ¹
- or
- [BMS-UY 1004 Introduction to Cell and Molecular Biology](#) 4 Credits ¹
 - [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
 - [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits

Sophomore Year

Fall Semester: 15 Credits

- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits
- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- Humanities and Social Sciences Elective #1 4 Credits ²

Spring Semester: 16 Credits

- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2104 Analytical Mechanics](#) 4 Credits
- [PH-UY 2344 Introduction to Modern and Solid State Physics](#) 4 Credits
- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits

Junior Year

Fall Semester: 17 Credits

- [PH-UY 3234 Electricity and Magnetism](#) 4 Credits
- PH 2/3**3 PH Elective 3 Credits
- [PH-UY 3002 Junior Physics Laboratory](#) 2 Credits
- [MA-UY 2224 Data Analysis](#) 4 Credits
- Humanities and Social Sciences Elective #2 4 Credits ²

Spring Semester: 16 Credits

- [PH-UY 4364 Introduction to the Quantum Theory](#) 4 Credits
- PH 2/3/4**4PH Elective 4 Credits
- MA 2/3/4**4 Math Elective 4 Credits
- Humanities and Social Sciences Elective #3 4 Credits ²
- [CM-GY 5040 Chemical Laboratory Safety](#) 0 Credits

Senior Year

Fall Semester: 17 Credits

- [PH-UY 4124 Thermodynamics and Statistical Physics](#) 4 Credits
- [PH-UY 4902 Introduction to Senior Project in Physics](#) 2 Credits
- [PH-UY 4912 Senior Seminar in Physics](#) 2 Credits
- PH 3/4/5**3PH Elective 3 Credits
- MA 3/4**3 Math Elective 3 Credits
- Free Elective 3 Credits

Spring Semester: 17 Credits

- [PH-UY 4904 Senior Project in Physics](#) 4 Credits
- PH 3/4/5**3 PH Elective 3 Credits
- PH 3/4/5**3 PH Elective 3 Credits
- Free Elective 3 Credits
- Humanities and Social Sciences Elective #4 4 Credits ²

Total credits required for the degree: 128

Footnotes

¹Students may choose to take a two-semester sequence in chemistry, or a combination of a single semester of chemistry and a semester of biology.

²To gain some breadth and depth of knowledge, take courses in at least two disciplines and at least one course at an advanced level.

Biomolecular Science, Biomedical Science Option, B.S.

Typical Course of Study for the Bachelor of Science in Biomolecular Science Option in Biomedical Science

Freshman Year

Fall Semester: 18 Credits

- [MA-UY 1054 Calculus I with Precalculus](#) 4 Credits¹
- [CM-UY 1014 General Chemistry I](#) 4 Credits
- [CM-UY 1101 Numerical Methods for Chemistry](#) 1 Credits
- [BMS-UY 1004 Introduction to Cell and Molecular Biology](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits²
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits

Spring Semester: 18 Credits

- [MA-UY 1154 Calculus II with Precalculus](#) 4 Credits
- [CM-UY 1024 General Chemistry II](#) 4 Credits
- [BMS-UY 2004 Introduction to Physiology](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [CM-UY 1032 Chemistry, the Central Science](#) 2 Credits

Sophomore Year

Fall Semester: 13 Credits

- [CM-UY 2213 Organic Chemistry I](#) 3 Credits
- [CM-UY 2211 Organic Chemistry Laboratory I](#) 1 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [BMS-UY 2512 Biostatistics](#) 2 Credits
- [CM-GY 5040 Chemical Laboratory Safety](#) 0 Credits
- [PL-UY 2144 Ethics and Technology](#) 4 Credits or other Ethics elective

Spring Semester: 14 Credits

- [CM-UY 2223 Organic Chemistry II](#) 3 Credits
- [CM-UY 2221 Organic Chemistry Laboratory II](#) 1 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits

- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [CM-UY 2614 Physical Chemistry I](#) 4 Credits
- [CM-UY 2102 Molecular Modeling in Chemistry](#) 2 Credits

Junior Year

Fall Semester: 16 Credits

- [BMS-UY 3114 Genetics](#) 4 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [CM-UY 3314 Biochemistry I](#) 4 Credits
- Humanities and Social Sciences Elective 4 Credits³

Spring Semester: 17 Credits

- [BMS-UY 3314 Advanced Cell and Molecular Biology I](#) 4 Credits
- [CM-UY 3324 Biochemistry II](#) 4 Credits
- [CM-UY 3514 Analytical Chemistry](#) 4 Credits
- [CM-UY 4011 Information Sources for the Chemical Sciences](#) 1 Credits
- Technical Elective 4 Credits⁴

Senior Year

Fall Semester: 16 Credits

- [BMS-UY 4914 Undergraduate Research in Biomolecular Science](#) 4 Credits⁷
- [BMS-UY 4324 Advanced Cell and Molecular Biology II](#) 4 Credits
- Technical Elective 4 Credits⁴
- Humanities and Social Sciences Elective 4 Credits³

Spring Semester: 16 Credits

- [BMS-UY 4924 Undergraduate Research in Biomolecular Science](#) 4 Credits⁷
- BMS 48XX Topics in Biology 4 Credits
- Technical Elective 4 Credits⁴
- Humanities and Social Sciences Elective 4 Credits³

Total credits required for graduation: 128

Footnotes

¹ Students placed by examination or an adviser into [MA-UY 914](#) must defer registration for [MA-UY 1054](#) or [MA-UY 1024](#).

² Students placed by examination or an adviser into [EN-UY 1084W](#) must subsequently register for [EXPOS-UA 1](#).

³ Approved Humanities and Social Sciences electives are (1) courses with the following prefixes: AH, AN, CAM, EN, MD, MU, PL, PS, HI, STS, SEG or URB, and (2) approved NYU College of Arts and Science courses. (See TCS Department for the list of approved courses.) One course must be at the 3xxx/4xxx level. At least one elective must be a writing-intensive course labeled by "W."

⁴ Electives for the Option in Biomedical Sciences: Two courses must be advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. The remaining courses are free electives.

- [CBE-UY 2124 Analysis of Chemical and Biomolecular Processes](#) 4 Credits
- [BMS-UY 3514 Organismal Physiology](#) 4 Credits
- [BMS-UY 3214 Microbiology](#) 4 Credits
- [BMS-UY 4414 Biophysics](#) 4 Credits
- BMS 48XX Topics in Biology 4 Credits
- [CM-GY 9443 Tissue Engineering](#) 3 Credits
- [BE-GY 6603 Drug Delivery](#) 3 Credits
- [BE-GY 6703 Materials in Medicine](#) 3 Credits

⁵ Electives for the Option in Biotechnology: Three courses must be advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. The remaining courses are free electives.

- [CBE-UY 2124 Analysis of Chemical and Biomolecular Processes](#) 4 Credits
- [BMS-UY 4324 Advanced Cell and Molecular Biology II](#) 4 Credits
- BMS 48XX Topics in Biology 4 Credits
- [BMS-UY 4314 Advanced Cell Physiology](#) 4 Credits
- [BMS-UY 3214 Microbiology](#) 4 Credits
- [CM-UY 4413 Polymer Science](#) 3 Credits
- [CM-GY 8213 Bioanalytical Chemistry](#) 3 Credits
- [BI-GY 7513 Chemical Foundation for Bioinformatics](#) 3 Credits
- [BI-GY 7533 Bioinformatics I: Sequence Analysis](#) 3 Credits
- [BI-GY 7543 Bioinformatics II: Protein Structure](#) 3 Credits
- [BT-GY 6013 Biotechnology and the Pharmaceutical Industry](#) 3 Credits
- [BT-GY 6023 Biotechnology and Health Care](#) 3 Credits
- [BT-GY 6033 Biosensors and Biochips](#) 3 Credits
- [BT-GY 6043 Biocatalysis in Industry](#) 3 Credits
- [BT-GY 9433 Protein Engineering](#) 3 Credits
- [BT-GY 9443 Tissue Engineering](#) 3 Credits
- [BT-GY 6053 Introduction to Neuroscience for Biotechnologists](#) 3 Credits
- [BT-GY 6063 Molecular Immunology](#) 3 Credits

- [BT-GY 6073 Genetic Engineering](#) 3 Credits
- [BT-GY 6093 Biomedical Materials & Devices for Human Body Repair](#) 3 Credits

⁶ Electives for the Option in Chemistry: Two courses must be advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. The remaining courses are free electives.

⁷Students may replace 8 credits of senior research with either (a) 8 credits of advanced CM, BMS, CBE, BE, BT or BI courses or (b) 4 credits of guided studies ([CM-UY 471X](#) or [BMS-UY 471X](#)) and 4 credits of advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. Students electing senior research must successfully complete a bachelor's thesis.

NOTES:

The department usually does not grant transfer credits to students who, while registered at the NYU Tandon School of Engineering, take biology or chemistry courses at other universities.

Biomolecular Science, Biotechnology Option, B.S.

Typical Course of Study for the Bachelor of Science in Biomolecular Science Option in Biotechnology

Freshman Year

Fall Semester: 18 Credits

- [MA-UY 1054 Calculus I with Precalculus](#) 4 Credits ¹
- [CM-UY 1014 General Chemistry I](#) 4 Credits
- [CM-UY 1101 Numerical Methods for Chemistry](#) 1 Credits
- [BMS-UY 1004 Introduction to Cell and Molecular Biology](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits ²
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits

Spring Semester: 18 Credits

- [MA-UY 1154 Calculus II with Precalculus](#) 4 Credits
- [CM-UY 1024 General Chemistry II](#) 4 Credits
- [BMS-UY 2004 Introduction to Physiology](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [CM-UY 1032 Chemistry, the Central Science](#) 2 Credits

Sophomore Year

Fall Semester: 13 Credits

- [CM-UY 2213 Organic Chemistry I](#) 3 Credits
- [CM-UY 2211 Organic Chemistry Laboratory I](#) 1 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [BMS-UY 2512 Biostatistics](#) 2 Credits
- [CM-GY 5040 Chemical Laboratory Safety](#) 0 Credits
- [PL-UY 2144 Ethics and Technology](#) 4 Credits or other Ethics elective

Spring Semester: 14 Credits

- [CM-UY 2223 Organic Chemistry II](#) 3 Credits
- [CM-UY 2221 Organic Chemistry Laboratory II](#) 1 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [CM-UY 2614 Physical Chemistry I](#) 4 Credits

- [CM-UY 2102 Molecular Modeling in Chemistry](#) 2 Credits

Junior Year

Fall Semester: 16 Credits

- [BMS-UY 3114 Genetics](#) 4 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [CM-UY 3314 Biochemistry I](#) 4 Credits
- Humanities and Social Sciences Elective 4 Credits³

Spring Semester: 17 Credits

- [BMS-UY 3314 Advanced Cell and Molecular Biology I](#) 4 Credits
- [CM-UY 3324 Biochemistry II](#) 4 Credits
- [CM-UY 3514 Analytical Chemistry](#) 4 Credits
- [CM-UY 4011 Information Sources for the Chemical Sciences](#) 1 Credits
- Technical Elective 4 Credits⁵

Senior Year

Fall Semester: 16 Credits

- [BMS-UY 4914 Undergraduate Research in Biomolecular Science](#) 4 Credits⁷
- Humanities and Social Sciences Elective 4 Credits³
- Technical Elective 4 Credits⁵
- Technical Elective 4 Credits⁵

Spring Semester: 16 Credits

- [BMS-UY 4924 Undergraduate Research in Biomolecular Science](#) 4 Credits⁷
- Technical Elective 4 Credits⁵
- Technical Elective 4 Credits⁵
- Humanities and Social Sciences Elective 4 Credits³

Total credits required for graduation: 128

Footnotes

¹ Students placed by examination or an adviser into [MA-UY 914](#) must defer registration for [MA-UY 1054](#) or [MA-UY 1024](#).

² Students placed by examination or an adviser into [EN-UY 1084W](#) must subsequently register for [EXPOS-UA 1](#).

³ Approved Humanities and Social Sciences electives are (1) courses with the following prefixes: AH, AN, CAM, EN, MD, MU, PL, PS, HI, STS, SEG or URB, and (2) approved NYU College of Arts and Science courses. (See TCS Department for the list of approved courses.) One course must be at the 3xxx/4xxx level. At least one elective must be a writing-intensive course labeled by “W.”

⁴ Electives for the Option in Biomedical Sciences: Two courses must be advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. The remaining courses are free electives.

- [CBE-UY 2124 Analysis of Chemical and Biomolecular Processes](#) 4 Credits
- [BMS-UY 3514 Organismal Physiology](#) 4 Credits
- [BMS-UY 3214 Microbiology](#) 4 Credits
- [BMS-UY 4414 Biophysics](#) 4 Credits
- BMS 48XX Topics in Biology 4 Credits
- [CM-GY 9443 Tissue Engineering](#) 3 Credits
- [BE-GY 6603 Drug Delivery](#) 3 Credits
- [BE-GY 6703 Materials in Medicine](#) 3 Credits

⁵ Electives for the Option in Biotechnology: Three courses must be advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. The remaining courses are free electives.

- [CBE-UY 2124 Analysis of Chemical and Biomolecular Processes](#) 4 Credits
- [BMS-UY 4324 Advanced Cell and Molecular Biology II](#) 4 Credits
- BMS 48XX Topics in Biology 4 Credits
- [BMS-UY 4314 Advanced Cell Physiology](#) 4 Credits
- [BMS-UY 3214 Microbiology](#) 4 Credits
- [CM-UY 4413 Polymer Science](#) 3 Credits
- [CM-GY 8213 Bioanalytical Chemistry](#) 3 Credits
- [BI-GY 7513 Chemical Foundation for Bioinformatics](#) 3 Credits
- [BI-GY 7533 Bioinformatics I: Sequence Analysis](#) 3 Credits
- [BI-GY 7543 Bioinformatics II: Protein Structure](#) 3 Credits
- [BT-GY 6013 Biotechnology and the Pharmaceutical Industry](#) 3 Credits
- [BT-GY 6023 Biotechnology and Health Care](#) 3 Credits
- [BT-GY 6033 Biosensors and Biochips](#) 3 Credits
- [BT-GY 6043 Biocatalysis in Industry](#) 3 Credits
- [BT-GY 9433 Protein Engineering](#) 3 Credits
- [BT-GY 9443 Tissue Engineering](#) 3 Credits
- [BT-GY 6053 Introduction to Neuroscience for Biotechnologists](#) 3 Credits

- [BT-GY 6063 Molecular Immunology](#) 3 Credits
- [BT-GY 6073 Genetic Engineering](#) 3 Credits
- [BT-GY 6093 Biomedical Materials & Devices for Human Body Repair](#) 3 Credits

⁶ Electives for the Option in Chemistry: Two courses must be advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. The remaining courses are free electives.

⁷Students may replace 8 credits of senior research with either (a) 8 credits of advanced CM, BMS, CBE, BE, BT or BI courses or (b) 4 credits of guided studies ([CM-UY 471X](#) or [BMS-UY 471X](#)) and 4 credits of advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. Students electing senior research must successfully complete a bachelor's thesis.

NOTES:

The department usually does not grant transfer credits to students who, while registered at the NYU Tandon School of Engineering, take biology or chemistry courses at other universities.

Biomolecular Science, Chemistry Option, B.S.

Typical Course of Study for the Bachelor of Science in Biomolecular Science Option in Chemistry

Freshman Year

Fall Semester: 18 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits¹
- [CM-UY 1014 General Chemistry I](#) 4 Credits
- [CM-UY 1101 Numerical Methods for Chemistry](#) 1 Credits
- [BMS-UY 1004 Introduction to Cell and Molecular Biology](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits²
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits

Spring Semester: 18 Credits

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [CM-UY 1024 General Chemistry II](#) 4 Credits
- [BMS-UY 2004 Introduction to Physiology](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [CM-UY 1032 Chemistry, the Central Science](#) 2 Credits

Sophomore Year

Fall Semester: 15 Credits

- [CM-UY 2213 Organic Chemistry I](#) 3 Credits
- [CM-UY 2211 Organic Chemistry Laboratory I](#) 1 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [CM-GY 5040 Chemical Laboratory Safety](#) 0 Credits
- Humanities and Social Sciences Elective 4 Credits³

Spring Semester: 14 Credits

- [CM-UY 2223 Organic Chemistry II](#) 3 Credits
- [CM-UY 2221 Organic Chemistry Laboratory II](#) 1 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [CM-UY 2614 Physical Chemistry I](#) 4 Credits

- [CM-UY 2102 Molecular Modeling in Chemistry](#) 2 Credits

Junior Year

Fall Semester: 15 Credits

- [CM-UY 4413 Polymer Science](#) 3 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [CM-UY 3314 Biochemistry I](#) 4 Credits
- [CBE-UY 2124 Analysis of Chemical and Biomolecular Processes](#) 4 Credits

Spring Semester: 17 Credits

- [CM-UY 3324 Biochemistry II](#) 4 Credits
- [CM-UY 3514 Analytical Chemistry](#) 4 Credits
- [CM-UY 4011 Information Sources for the Chemical Sciences](#) 1 Credits
- Technical Elective 4 Credits⁶
- Humanities and Social Sciences Elective 4 Credits³

Senior Year

Fall Semester: 16 Credits

- [CM-UY 4914 Undergraduate Research in Chemistry](#) 4 Credits⁷
- Technical Elective 4 Credits⁶
- Technical Elective 4 Credits⁶
- Humanities and Social Sciences Elective 4 Credits³

Spring Semester: 15 Credits

- [CM-UY 4924 Undergraduate Research in Chemistry](#) 4 Credits⁷
- Technical Elective 4 Credits⁶
- Technical Elective 3 Credits⁶
- Humanities and Social Sciences Elective 4 Credits³

Total credits required for graduation: 128

Footnotes

¹ Students placed by examination or an adviser into [MA-UY 914](#) must defer registration for [MA-UY 1054](#) or [MA-UY 1024](#).

² Students placed by examination or an adviser into [EN-UY 1084W](#) must subsequently register for [EXPOS-UA 1](#).

³ Approved Humanities and Social Sciences electives are (1) courses with the following prefixes: AH, AN, CAM, EN, MD, MU, PL, PS, HI, STS, SEG or URB, and (2) approved NYU College of Arts and Science courses. (See TCS Department for the list of approved courses.) One course must be at the 3xxx/4xxx level. At least one elective must be a writing-intensive course labeled by “W.”

⁴ Electives for the Option in Biomedical Sciences: Two courses must be advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. The remaining courses are free electives.

- [CBE-UY 2124 Analysis of Chemical and Biomolecular Processes](#) 4 Credits
- [BMS-UY 3514 Organismal Physiology](#) 4 Credits
- [BMS-UY 3214 Microbiology](#) 4 Credits
- [BMS-UY 4414 Biophysics](#) 4 Credits
- BMS 48XX Topics in Biology 4 Credits
- [CM-GY 9443 Tissue Engineering](#) 3 Credits
- [BE-GY 6603 Drug Delivery](#) 3 Credits
- [BE-GY 6703 Materials in Medicine](#) 3 Credits

⁵ Electives for the Option in Biotechnology: Three courses must be advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. The remaining courses are free electives.

- [CBE-UY 2124 Analysis of Chemical and Biomolecular Processes](#) 4 Credits
- [BMS-UY 4324 Advanced Cell and Molecular Biology II](#) 4 Credits
- BMS 48XX Topics in Biology 4 Credits
- [BMS-UY 4314 Advanced Cell Physiology](#) 4 Credits
- [BMS-UY 3214 Microbiology](#) 4 Credits
- [CM-UY 4413 Polymer Science](#) 3 Credits
- [CM-GY 8213 Bioanalytical Chemistry](#) 3 Credits
- [BI-GY 7513 Chemical Foundation for Bioinformatics](#) 3 Credits
- [BI-GY 7533 Bioinformatics I: Sequence Analysis](#) 3 Credits
- [BI-GY 7543 Bioinformatics II: Protein Structure](#) 3 Credits
- [BT-GY 6013 Biotechnology and the Pharmaceutical Industry](#) 3 Credits
- [BT-GY 6023 Biotechnology and Health Care](#) 3 Credits
- [BT-GY 6033 Biosensors and Biochips](#) 3 Credits
- [BT-GY 6043 Biocatalysis in Industry](#) 3 Credits
- [BT-GY 9433 Protein Engineering](#) 3 Credits
- [BT-GY 9443 Tissue Engineering](#) 3 Credits

- [BT-GY 6053 Introduction to Neuroscience for Biotechnologists](#) 3 Credits
- [BT-GY 6063 Molecular Immunology](#) 3 Credits
- [BT-GY 6073 Genetic Engineering](#) 3 Credits
- [BT-GY 6093 Biomedical Materials & Devices for Human Body Repair](#) 3 Credits

⁶ Electives for the Option in Chemistry: Two courses must be advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. The remaining courses are free electives.

⁷Students may replace 8 credits of senior research with either (a) 8 credits of advanced CM, BMS, CBE, BE, BT or BI courses or (b) 4 credits of guided studies ([CM-UY 471X](#) or [BMS-UY 471X](#)) and 4 credits of advanced CM, BMS, CBE, BE, BT or BI courses. Graduate courses may be taken only by students with junior standing and a C+ average or better, unless otherwise approved by the adviser. Students electing senior research must successfully complete a bachelor's thesis.

NOTES:

The department usually does not grant transfer credits to students who, while registered at the NYU Tandon School of Engineering, take biology or chemistry courses at other universities.

Business and Technology Management, B.S.

Academic and Administrative Program Director: [Bohdan Hoshovsky](#)

Goals and Objectives

The Bachelor of Science in Business and Technology Management (BTM) Program is anchored on certain overarching themes, including:

- Achieving prowess through innovation, technology management and entrepreneurship.
- Leading based on a broad understanding of technology's role in the modern enterprise.
- Developing a global perspective of modern value creation.
- Committing oneself to service to the community.
- Adhering to the highest ethical standards.
- Obtaining practical exposure-through internships, speakers, on-site visits in New York City, etc.-to the latest best practices in management, especially as related to technology and innovation management and entrepreneurship.

BTM is oriented toward current and future arenas where high growth occurs. The program assumes that modern business leaders must be deeply familiar with technology and innovation. Those who have such knowledge are likely to have a distinct advantage and prosperous and satisfying careers. When appropriate, these leaders also can leverage entrepreneurship in diverse venues. The BTM Program prepares students to become such leaders.

BTM also provides students with relevant professional management education and effective approaches related to technology, innovation and information management and entrepreneurship. In other words, BTM creatively fuses modern business administration with state-of-the-art technology management.

The BTM Program also offers rigorous training in the qualitative, quantitative and innovative aspects of technology and innovation management. All courses nurture a broad managerial background along with specific application of ideas and practices relevant to the world of technologically innovative goods and services.

The art and science of management also demand that practitioners communicate ideas effectively. Therefore, as central components of the BTM learning experience the program emphasizes spoken and written presentations in individual, team, classroom and field internship settings.

Students completing BTM are prepared to succeed in a variety of positions-such as technology project leaders, technology entrepreneurs, venture capitalists, technology finance controllers, technology, finance and IT analysts for various organizations, consultants in professional-services firms, marketing and business-unit managers for new products and services, and a variety of other exciting roles. BTM graduates work in large and small companies and they excel at jobs that require a cross-functional understanding of both technology and the motivational, financial, innovative and international challenges that need to be met for innovation to succeed. BTM students are also well prepared for advanced professional studies in management, such as in a MS in Management, MOT, or MBA program, as well as more scholarly and research oriented programs, such as PhD studies.

Pedagogy

Management courses are taught using a variety of pedagogical methods. These include:

- Theory-led teaching
- Case-method education
- Project-based and team-based teaching
- Action learning in the field

Experiential-Based Learning

Teaching based on exposition of theory is often relevant to technology management classes. Case-method teaching emphasizes real-world business experiences and challenges students to draw general principles from many examples. Project-based and team based education is experiential; students learn by doing, much as they would in a natural sciences laboratory class. Learning by doing in the field is also encouraged. It is very common in management courses for all pedagogical approaches to be employed.

Course Distribution

The BTM Program requires 127 or 128 credits for graduation. Key characteristics* of this curriculum include:

- 56 credits in management
- 32 credits in courses in humanities and social sciences
- 12 credits in courses in mathematics
- 8 credits in “restricted” electives chosen from math, science, social sciences and humanities
- 7 credits in science
- 4 credits in computer science
- 4 credits in a “technical” elective
- 1 credit in the Engineering and Technology Forum
- 3 or 4 credits Free Elective

*Please see the Typical Course of Study for the BS in BTM Program at the end of this section.

Currently, all required management courses for the BS in BTM are each 4 credits except for two courses at 2 credits. This current curriculum accommodates 4-credit courses in humanities and social sciences, as well as a 3-credit course in the sciences.

Course Numbering

BTM courses are numbered with the following schema:

- The first digit of a course number corresponds to the year in which a BTM student would take the course (1 = first year, etc.)
- The second digit reflects the primary nature of the course material. Courses numbered with a second digit of
 - “0” are focused primarily on processes in management
 - “1” are oriented toward organizational behavior

- “2” are quantitative in nature
- “3” describe a firm’s relationships with external forces
- “4” study innovation
- “5” are capstone courses
- “6” are Internship and Service courses
- “9” thesis

Thus, [MG-UY 3304 Introduction to Supply Chain Management](#) is a 4-credit junior-year course focusing on external relationships.

Concentrations

Students in this degree program may direct their study in one of two areas of concentration, which focus on particular issues and strategies that apply to business and technology management:

1. **Technology Innovation and Strategy** enables students to develop effective skills for conducting strategic analysis addressing marketing, logistics, channel and operations managements issues, as well as relevant best business practices in the technological arena.
2. **Technology and Innovation in Finance** prepares students to understand financial theory and how firms use modern finance for strategic and tactical decision-making.

Candidates who choose the Technology Innovation and Strategy concentration must complete both [MG-UY 3304](#) (Introduction to Supply Chain Management) in their 6th semester and [MG-UY 4004](#) (Management Strategy in Technology Sectors) in their 7th semester. Students electing the Technology and Innovation in Finance concentration of study must complete both [MG-UY 3214](#) (Advanced Corporate Finance) in their 6th semester and [MG-UY 4214](#) (Financial Strategy) in their 7th semester.

Degree Requirements

To remain in good standing, candidates for the degree BS-BTM must satisfy the following requirements, in addition to NYU Tandon requirements for a minimum term and cumulative 2.0 GPA in all courses:

- An average of C (2.0) or better in all MG courses must be maintained.
- A course in which the grade of I is received may not be used to satisfy any prerequisites until the incomplete is resolved.

Honors Capstone (Including Thesis and Honor’s Thesis)

Students who earn a 3.6 cumulative GPA or better in MG-UY courses through their junior year of study qualify for honors senior project capstone courses. These students are also free to not elect this project sequence.

As part of the Honor’s Capstone course, students who earn a 3.6 cumulative GPA or better in MG-UY courses through their junior year qualify for an optional [MG-UY 4904 BS Thesis in Business and Technology Management](#) and follow the guidelines as outlined in the Academic Policies and Degree Requirements section of this catalog. They are advised to meet with the BTM Program Director before completing their junior year.

Information

Curricula and prerequisite changes, new courses, special sections and other special announcements are posted in the Department of Technology, Management and Innovation office suite and on the program's website at <http://engineering.nyu.edu>. Students are responsible for keeping informed, tracking their progress and are encouraged to visit the BTM Program Director regularly.

Typical Course of Study for the Bachelor of Science in Business and Technology Management

See Footnotes ¹⁴ and ¹⁵

Freshman Year

Fall Semester: 16 Credits

- [MA-UY 1054 Calculus I with Precalculus](#) 4 Credits ^{1a}
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits (Humanities and Social Sciences1) ²
- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits
- Science Elective (1) 4 Credits ³

Spring Semester: 14 Credits

- [MA-UY 1154 Calculus II with Precalculus](#) 4 Credits ^{1b}
- [MG-UY 1002 Foundations of Management](#) 2 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits (Humanities and Social Sciences 2) ²
- Science Elective(2) 3 Credits ³

Sophomore Year

See Footnotes ¹¹

Fall Semester: 16 Credits

- [MG-UY 2204 Financial Accounting](#) 4 Credits
- [MG-UY 2004 Management of Information Technology and Systems](#) 4 Credits
- [MG-UY 2104 Organizational Behavior](#) 4 Credits
- CAM/STS/SEG/TCS Cluster Elect 4 Credits (Humanities and Social Sciences 3) ²

Spring Semester: 16 Credits

- [MG-UY 2304 Marketing](#) 4 Credits
- [ECON-UA 2 Economic Principles II \(Microeconomics\)](#) (HuSS 4) 4 Credits ¹²
- [MG-UY 2014 Operations Management](#) 4 Credits
- [MA-UY 2054 Applied Business Data Analysis I](#) 4 Credits ¹³

Junior Year

See Footnotes ¹¹

Fall Semester: 18 Credits

- [MG-UY 3204 Introduction to Finance](#) 4 Credits
- [MG-UY 3024 Management of Data Communications and Networking](#) 4 Credits
- [MG-UY 3002 Project Management](#) 2 Credits
- [PL-UY 2144 Ethics and Technology](#) 4 Credits (Humanities and Social Sciences 5) ⁴
- Technical Elective 4 Credits ⁷

Spring Semester: 16 Credits

- [MG-UY 3404 Innovation Management](#) 4 Credits
- [MG-UY 3304 Introduction to Supply Chain Management](#) 4 Credits (Strat. Con.) ¹⁰
or
- [MG-UY 3214 Advanced Corporate Finance](#) 4 Credits (Fin. Con.) ¹⁰
- Restricted Elective(1) 4 Credits ⁵
- CAM/STS/SEG/TCS Cluster Elect 4 Credits ² (Humanities and Social Sciences 6) ²

Senior Year

See Footnotes ¹¹

Fall Semester: 16 Credits

- [MG-UY 4004 Management Strategy in Technology Sectors](#) 4 Credits (Strat.Con.) ¹⁰
or
- [MG-UY 4214 Financial Strategy](#) 4 Credits (Fin. Con.) ¹⁰
- [MG-UY 4404 Entrepreneurship](#) 4 Credits ⁶
- Restricted Elective (2) 4 Credits ⁵
- BTM Mandatory STS Cluster Elective 4 Credits ² (Humanities and Social Sciences 7) ⁸

Spring Semester: 15 or 16 Credits

- [MG-UY 4504 Global Perspectives on Technology Management: A Capstone Project Course](#) 4 Credits
- [MG-UY 4204 Management Science](#) 4 Credits ⁶
- Free Elective 3 or 4 Credits ⁹
- CAM/STS/SEG/TCS Cluster Elect 4 Credits ² (Humanities and Social Sciences 8) ²

Total credits required for graduation: 127 or 128

Footnotes

^{1a} Students who are placed through the Mathematics Placement Exam or by a Mathematics Advisor, into [MA-UY 914](#) Pre-Calculus or [MA-UY 954](#) Pre-Calculus, must successfully complete the course before progressing to [MA-UY 1054](#) Calculus I with Pre-Calculus. A more advanced Calculus I course may be substituted only with written permission by an NYU Tandon Mathematics Advisor.

^{1b} MA-UY 1052 Calculus II with Pre-Calculus is no longer offered and is replaced with [MA-UY 1154](#) Calculus II with Pre-Calculus. A more advanced Calculus II may be substituted only with written permission by an NYU Tandon Mathematics Advisor.

² Follow latest NYU Tandon School of Engineering & Expository Writing and TCS Humanities and Social Science (HuSS) Elective Requirements as stated per the NYU Tandon School of Engineering bulletin.

³ Approved science electives are [CM-UY 1004](#) or [CM-UY 1014](#), [BMS-UY 1004](#) and [PH-UY 1013](#) or [PH-UY 1213](#). [EG-UY 1001](#) and [EG-UY 1003](#) are NOT an approved as science electives for BTM. Any science course replacement requires approval by the BSBTM Program Director.

⁴ [PL-UY 2144 Ethics and Technology](#) is mandatory for all BTM majors and counts toward HuSS credits.

⁵ Restricted Electives are courses in math, science, Humanities and Social Sciences (HuSS) ONLY. Computer Science courses may not be counted as Restricted Electives. Restricted elective HuSS courses follow the new 4-credit approved Humanities and Social Sciences electives.

⁶ Students with a 3.6 GPA or better in major at the end of junior year may substitute [MG-UY 4514 Honors Capstone Project in Technology, Innovation and/or Information Management and Entrepreneurship I](#) (4 credits) or the Bachelor's Thesis in Management (4 credits and with permission by the Dept. Chair) for [MG-UY 4404 Entrepreneurship](#) . They may also substitute [MG-UY 4524 Honors Capstone Project in Technology, Innovation and/or Information Management Or Entrepreneurship II](#) (4 credits) or [MG-UY 4904 BS Thesis in Business and Technology Management](#) (4 credits and with permission by the Dept. Chair) in Management for [MG-UY 4204 Management Science](#) . The Bachelor's Thesis in Management may take longer than 1 semester to complete and students must follow all thesis guidelines.

⁷ Technical Electives can be chosen from computer science, engineering, mathematics, chemistry, physics, bio-molecular sciences, digital media, and undergraduate finance (FIN-UY) courses from the Department of Finance and Risk Engineering. Technical Electives do not count towards the General Education requirements.

⁸ The TCS STS Cluster BTM Mandatory Technology Subset can ONLY be fulfilled by any ONE of the following 4cr TCS Cluster 2: Science, Technology and Society (STS) courses listed below (as writing (W) or non writing courses):

- [HI-UY 2364 History of Aviation and Aviation Technology](#)
- [HI-UY 3304 Science and Technology as a Strategic Resource in World War II](#)
- [PL-UY 2004 Symbolic Logic](#)
- [PL-UY 2134 Philosophy of Science, Technology and Society in China and India](#)
- [PL-UY 2204 Philosophy of Technology](#)
- [PL-UY 3204 Philosophy of Technology: The Critique of Heidegger](#)
- [PL-UY 3214 The Phenomenon of Life](#)
- [PL-UY 3254/W Philosophy of Science](#)
- [PL-UY 2294 Quantum Mechanics and Information](#)
- [PS-UY 2724 Human Factors in Engineering Design](#) (TCS SEG Cluster 3 course)
- [PS-UY 2614 Psychology of the Internet](#)
- [PS-UY 2644 Creativity and Innovation](#)
- [PS-UY 2664 Intelligence: Real and Artificial](#)
- [PS-UY 3604 Psychology of Internet Security](#)
- [STS-UY 2004 Science, Technology, and Society](#)
- [STS-UY 2444 History and Philosophy of Internet Technology](#)
- [STS-UY 2454/W Digital Humanities](#)
- [STS-UY 2264/W Addressing Public Policy Issues in the Sciences, Engineering and Medicine](#)
- [STS-UY 2614/W Science Fiction for Innovation](#)
- [STS-UY 3004/W Seminar in Science and Technology Studies](#)
- [STS-UY 3214 Science & Feminism](#)
- [URB-UY 3214 Cities in Developing Countries](#)
- [URB-UY 2234 Natural Environmental Catastrophes and Cities](#)
- [URB-UY 3234 Planning for Healthy Cities](#)

Please note that the above TCS electives may also be used as normal (BTM) HuSS electives.

⁹ A Free Elective is defined as any three or four credit course within NYU.

¹⁰ Students must select, remain in and complete a BTM Concentration. Current BS BTM Concentrations are Technology Innovation and Strategy Concentration (Strat Concen) & Technology and Innovation in Finance Concentration (Fin Concen). Candidates who choose the Technology Innovation and Strategy concentration must complete both [MG-UY 3304](#) (Introduction to Supply Chain Management) in their 6th semester and [MG-UY 4004](#) (Management Strategy in Technology Sectors) in their 7th semester. Students electing the Technology and Innovation in Finance concentration of study must complete both [MG-UY 3214](#) (Advanced Corporate Finance) in their 6th semester and [MG-UY 4214](#) (Financial Strategy) in their 7th semester.

¹¹ Students may participate in an internship experience through [CP-UY 2011](#) and/or [CP-UY 2021](#) or [MG-UY 4603](#), for a maximum of 3 total internship related credits which will only count as a Free Elective.

¹² ECON-UA 2 Economic Principles II (Microeconomics) replaces the prior [EC-UY 2524](#) Managerial Microeconomics.

¹³ With written permission from the NYU Tandon Dept. of Mathematics, [MA-UY 2054](#) Applied Data Analysis may be substituted with [MA-UY 2224](#) Data Analysis.

¹⁴ Grandfathering rules may apply.

¹⁵ This chart is for incoming Fall 2014 BTM Freshmen and onwards.

Note: THIS CHART IS ALSO USED FOR ADVISEMENT AND BS BTM DEGREE REQUIREMENT AUDIT CHECKLIST. ALL INFORMATION IS SUBJECT TO REVISION.

Chemical and Biomolecular Engineering, B.S

Undergraduate Program

The undergraduate program in chemical and biomolecular engineering provides a strong foundation in mathematics and the physical, chemical, and biological sciences. The program builds upon these broad fundamentals to provide students with a thorough understanding of their applications in chemical engineering practice, emphasizing universality of natural laws and engineering principles whether at the scale of molecular systems or industrial processes. This is accomplished through a closely integrated set of core engineering courses that include engineering thermodynamics, conservation laws, reaction kinetics and engineering, unit operation theory and practice, process dynamics, fluid mechanics, and heat and mass transport. The curriculum culminates in a capstone design project, and includes a year-long laboratory that introduces students to classical and modern aspects of chemical engineering operations.

The undergraduate program leads to a Bachelor of Science in Chemical and Biomolecular Engineering and is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

Educational Objectives

The Chemical and Biomolecular Engineering program prepares graduates who:

- apply their technical and communication skills to the pursuit of careers in the chemical, biochemical, energy and related industries or
- pursue advanced study in graduate programs in chemical engineering and related fields, and in professional programs such as medicine, business, and law
- creatively apply their knowledge and skills to a broad range of pursuits, taking into account global, environmental, economic, safety, and ethical issues
- work both independently and collaboratively to manage complex technical projects
- advance and lead in their chosen field, continually improving their understanding and expertise through formal and informal education.

Curriculum

Design is essential to chemical and biomolecular engineering and is incorporated throughout the core courses. Earlier courses emphasize fundamental engineering concepts, while later courses increasingly involve design components and more complex design problems. The senior year introduces a year-long process-design sequence, in which students design chemical and biomolecular processes while considering engineering, safety, environmental and economic constraints.

The chemical and biomolecular engineering major enables graduates to select professional careers from an extremely broad spectrum of opportunities. Graduates are prepared for employment in the chemical, pharmaceutical, consumer products, microelectronics, energy, environmental and related industries, or to enter graduate school.

Undergraduate Advising

All entering freshmen are advised through the Academic Advisement Center. Departmental academic advisers advise sophomores, juniors, seniors and transfer students. Students meet with their academic advisers at least once a semester, coincident with registration for the next term. At this meeting, the adviser discusses the student's work and checks progress towards meeting degree requirements. A graduation checklist must be completed for all students prior to graduation, indicating that all academic requirements have been met.

Requirements for the Bachelor of Science

In addition to the NYU Tandon requirement of a 2.0 GPA or better for graduation, students must also meet the department's academic standards. For chemical and biomolecular engineering students to advance to senior-year, they must maintain a minimum average GPA of 2.5 in courses [CBE-UY 1002](#), [CBE-UY 2124](#), [CBE-UY 3153](#), [CBE-UY 3313](#), [CBE-UY 3233](#), [CBE-UY 3223](#) and [CBE-UY 3323](#). The same course must not be failed twice. Students who fail to meet these requirements are not allowed to register for senior courses. All listed prerequisites must be satisfied before students may enroll in CBE courses.

Typical Course of Study for the Bachelor of Science in Chemical and Biomolecular Engineering

Freshman Year

Fall Semester: 16 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits ¹
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits ²
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits

Spring Semester: 17 Credits

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [BMS-UY 1004 Introduction to Cell and Molecular Biology](#) 4 Credits
- [CBE-UY 1002 Introduction to Chemical and Biomolecular Engineering](#) 2 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits

Sophomore Year

Fall Semester: 14 Credits

- [PH-UY 1013 Mechanics](#) 3 Credits
- [CM-UY 2213 Organic Chemistry I](#) 3 Credits
- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [CBE-UY 2124 Analysis of Chemical and Biomolecular Processes](#) 4 Credits

Spring Semester: 15 Credits

- [CM-UY 2614 Physical Chemistry I](#) 4 Credits
- [CM-UY 2223 Organic Chemistry II](#) 3 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits

Junior Year

Fall Semester: 18 Credits

- [CM-UY 3314 Biochemistry I](#) 4 Credits
- [CBE-UY 3153 Chemical and Biomolecular Engineering Thermodynamics](#) 3 Credits
- [CBE-UY 3313 Transport I](#) 3 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- Humanities and Social Sciences Elective 4 Credits³

Spring Semester: 16 Credits

- [CBE-UY 3233 Chemical and Biomolecular Engineering Separations](#) 3 Credits
- [CBE-UY 3223 Kinetics and Reactor Design](#) 3 Credits
- [CBE-UY 3323 Transport II](#) 3 Credits
- Engineering Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits³

Senior Year

Fall Semester: 16 Credits

- [CBE-UY 4113 Engineering Laboratory I](#) 3 Credits
- [CBE-UY 4143 Process Dynamics and Control](#) 3 Credits

- [CBE-UY 4163 Chemical and Biomolecular Process Design I](#) 3 Credits
- Free Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits³

Spring Semester: 16 Credits

- [CBE-UY 4213 Engineering Laboratory II](#) 3 Credits
- [CBE-UY 4173 Polymeric Materials](#) 3 Credits
- [CBE-UY 4263 Chemical and Biomolecular Process Design II](#) 3 Credits
- Engineering Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits³

Total credits required for graduation: 128

Footnotes

¹ Students who are placed by examination or by an adviser into [MA-UY 902](#), [MA-UY 912](#) or [MA-UY 914](#) must defer registration for [MA-UY 1024](#).

² Students who are placed by examination or by an adviser into [EN-UY 1084W](#) must subsequently register for EN-UY 1033W, rather than [EXPOS-UA 1](#).

³ The requirements for Humanities and Social Sciences electives are described in the Undergraduate Academic Programs and Policies section of this catalog.

TRANSFER STUDENTS may substitute engineering electives in place of [EG-UY 1003](#) and [CBE-UY 1002](#).

Civil Engineering, B.S.

Undergraduate Program

The Department of Civil and Urban Engineering develops engineering graduates capable of contributing to and advancing the practice of civil engineering and its subdisciplines. Through its research programs, the department strives to be at the forefront in selected areas in the development of new knowledge and applications in civil engineering. Through its educational programs, graduates will be well rounded in state-of-the-art techniques and will develop the skills needed to apply them in a complex profession. Among these skills are the abilities to communicate effectively in written and verbal form and understand the context of civil engineering projects in a complex society.

Program Educational Objectives

Program educational objectives relate to where the Department of Civil and Urban Engineering expects its graduates to be within three to five years of earning undergraduate degrees. NYU Polytechnic School of Engineering's undergraduate program in civil engineering is strongly practice-oriented, heavily emphasizing design, to prepare students for entry-level positions in any civil engineering subdiscipline or for graduate study. While some graduates eventually may work in other professions, the specific educational objectives of the program are as follows:

1. For graduates to be working in a responsible position in civil engineering or a closely-related profession (not including those who are engaged in full-time graduate study).
2. For graduates to have advanced in their careers to a position of higher responsibility.
3. For graduates to be engaged in some form of continuing education, including, but not limited to, graduate education, professional development programs, relevant short courses and seminars, in-house training programs or similar activities.

Student Outcomes

Program outcomes are those abilities and skills that graduates are expected to have upon graduation with a BS in Civil Engineering degree. For these, the Department has adopted the 11 fundamental outcomes specified by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. They cover the full breadth and depth of the abilities and skills needed by modern engineering professionals. They are listed below with brief discussions of how each relates to the civil engineering profession.

- a. *An ability to apply knowledge of mathematics, science and engineering.* Virtually all of civil engineering involves the application of mathematics and basic sciences to the solution of real-world infrastructure problems. Fundamental engineering skills evolve directly from science and mathematics. Students are immersed in these applications across all subdisciplines of civil engineering.
- b. *An ability to design and conduct experiments, as well as to analyze and interpret data.* Civil engineers must engage in a number of basic experiments, and be aware of how to collect, organize, report and interpret the results of basic experiments and direct field observations of infrastructure operations. In the program, students are exposed to a wide range of laboratory experiments, including experiments in fluid mechanics, material behavior under loading, soil

properties and behavior, and others. They also are exposed to the collection of field data related to environmental conditions and problems, highway and street traffic, and the monitoring of structures.

- c. *An ability to design a system, component, or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.* The program is heavily design-oriented. Several courses include full design-project laboratories, including Steel Design Project, Transportation Engineering, Foundation Design, Senior Design I & II, and others. Many additional courses have design components, and all students finish their academic programs with a comprehensive civil engineering capstone project. As the student progresses, the complexity of design applications increases, as do the number and breadth of practical constraints on potential solutions.
- d. *An ability to function on multidisciplinary teams.* Modern engineering is not done by stand-alone engineers. Any significant project involves several engineers, perhaps with different engineering backgrounds, as well as non-engineers (planners, architects, financiers, managers, etc). Students have the opportunity to work in teams in several courses, but particularly in the capstone design project.
- e. *An ability to identify, formulate and solve engineering problems.* Engineers do not just solve problems brought to them by others. Engineers must spot problems before they become evident and describe them in terms that expedite their solution. As students progress through the program, they increase their participation in identifying and framing problems, as well as in developing comprehensive solutions.
- f. *An understanding of professional and ethical responsibility.* All professionals must be keenly aware of their general and professional ethical responsibilities to society in general, and to others who require and pay for their services. Like many professions, engineers, and civil engineers in particular, have specific ethical codes issued by professional societies with which they must comply. General ethical considerations are discussed throughout the curriculum, and several courses have a strong focus on the basis for, and application of, professional ethical code.
- g. *The ability to communicate effectively.* To be an effective professional in the modern world, one must be an effective communicator. Engineers must explain their views and solutions to problems in ways that can be understood clearly by other professionals and by the public. Modern communication involves written and oral forms, and a wide variety of electronic media. NYU Polytechnic School of Engineering students are exposed to, and are required to use, all of these methods to prepare for their careers.
- h. *The broad education necessary to understand the impact of engineering solutions in a global, environmental and societal context.* Engineers do not solve problems in a vacuum. Everything engineering professionals do affects the world around them. In the modern world economy, the “world” includes local neighborhoods, regions, states, nations and, indeed, the world. Solutions must be couched in a firm understanding of the impacts they will have on the environment, the economy and society.
- i. *A recognition of the need for, and an ability to engage in, lifelong learning.* The engineering profession changes rapidly with the technological world. While general principles tend to change slowly, the specific materials, analysis techniques and approaches to engineering change quite rapidly. The body of knowledge graduates leave with must be updated constantly and expanded during their professional lives. The program provides opportunities for students to appreciate this need, and develop useful skills for self-learning, now and in the future.

- j. *Knowledge of contemporary issues.* Engineering students study in a context in which local, regional and national infrastructure issues are in the forefront. Current issues and problems are discussed in virtually all courses, and students' attention is called to immediate issues as they arise.
- k. *An ability to use the techniques, skills and modern engineering tools necessary for professional practice.* The program is frequently updated to incorporate the latest approaches to engineering solutions, and to include the use of modern engineering tools. Important "tools" include a variety of computer programs for data analysis, simulation and design. Many course laboratories use the most up-to-date techniques and software packages available to engineering professionals.

Required Courses

The undergraduate curriculum provides a solid foundation in all major subdisciplines through required courses.

Four courses provide the engineering science and professional underpinnings for all subdisciplines: [CE-UY 2113 Statics](#), [CE-UY 2123 Mechanics of Materials](#), [CE-UY 2213 Fluid Mechanics and Hydraulics](#) and [CE-UY 1002 Introduction to Civil Engineering](#). Structural engineering is covered in [CE-UY 3122 Structural Dynamics](#), [CE-UY 3133 Structural Analysis](#), [CE-UY 3173 Structural Design](#), CE-UY 3163 Materials Engineering and [CE-UY 4153 Structural Design Project](#). The required environmental and water resources sequence includes [CE-UY 3223 Environmental Engineering I](#) and [CE 3243 Water Resources Engineering](#). Soils engineering is covered in [CE-UY 3153 Geotechnical Engineering](#). Transportation Engineering is introduced in [CE-UY 2343 Transportation Engineering](#). Because the department also has a full undergraduate program in Construction Management, civil engineering students must select two construction engineering courses from an approved list. All students take the capstone course, given over two semesters as [CE-UY 4812 Civil Engineering Design I: Site Planning and Design](#) and [CE-UY 4822 Civil Engineering Design II: Structural Design](#).

Design is covered in many of these courses, exposing students to design in various subdisciplines. An introduction to design is provided by [EG-UY 1003](#) in the freshman year. Courses [CE-UY 3173](#), [CE-UY 3223](#), [CE-UY 3243](#), [CE-UY 3153](#), and [CE-UY 4153](#) all have significant design content. Most elective courses also have strong design components. All students must complete two 2-credit senior design projects ([CE-UY 4812](#) & [CE-UY 4822](#)) during their senior year.

Thus, students have progressive design exposure in each program year.

Undergraduate elective courses are provided in structural, geotechnical, environmental, water resources and transportation engineering, and construction management and engineering. These allow students to gain significant depth in these areas. Selected students with sufficient grade point averages may take beginning graduate courses in these areas. Special topics courses are provided in each major subdiscipline and are offered as needed.

Communication skills are emphasized throughout the curriculum. The humanities and social sciences portions of the curriculum focus strongly on developing writing and oral skills. The freshman engineering program also includes substantial emphasis on oral presentations and written report assignments. [CE-UY 1002 Introduction to Civil Engineering](#) includes numerous written assignments and encourages discussion. All courses with associated laboratories require written laboratory or project reports; many design courses require formal submission of design reports,

some with oral presentations. The senior design-project experience includes many oral and written progress reports and is formally presented and defended as part of final submission.

Humanities and social sciences courses also help students to understand the societal context of their profession. [CE-UY 1002 Introduction to Civil Engineering](#) reinforces this understanding with specific civil engineering references and provides a focused treatment of professional ethics. These aspects are also highlighted in other civil-engineering curriculum courses.

Other Requirements

The BS in Civil Engineering program has three additional requirements:

1. Because a sound foundation in Statics is essential to progress in civil engineering, students must achieve a grade of C or better in [CE-UY 2113 Statics](#) to register for subsequent courses in the structures sequence: [CE-UY 2123 Mechanics of Materials](#), [CE-UY 3133 Structural Analysis](#), [CE-UY 3173 Structural Design](#) , and [CE-UY 4153 Structural Design Project](#) ;
2. Since the capstone design courses, [CE-UY 4812](#) & [CE-UY 4822](#), require a thorough understanding of all aspects of civil engineering, students must have a cumulative average of 2.0 or better in all civil engineering courses in order to enroll in them; and
3. To promote interest in professional registration, students must register for the Fundamentals of Engineering (FE) exam, which is administered by the National Council of Examiners for Engineering and Surveying (NCEES). [CE-UY 4092](#) includes a zero-credit recitation that provides preparation for the exam. Students who are not legally eligible to hold a professional engineer's (PE) license are exempt from this requirement, but must still take [CE-UY 4092](#).

Accreditation

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

The curriculum for the BS in Civil Engineering is described in the tables that follow. Table 1 summarizes the curriculum and its requirements in subject-area categories. Table 2 summarizes elective courses in construction management, engineering and civil engineering. A typical four-year course of study for civil engineering majors is shown on the full-page chart at the end of this section.

Curriculum

Table 1: Curriculum for the BS in Civil Engineering

Mathematics: 16 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits ¹
- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits ¹
- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits ¹
- [MA-UY 2224 Data Analysis](#) 4 Credits ¹

Sciences: 18 Credits

- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- Science Elective 3 Credits²

General Engineering, Computer Science: 7 Credits

- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits

Humanities and Social Science: 24 Credits

- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- Humanities and Social Sciences Electives 16 Credits³

Civil Engineering: 61 Credits

- [CE-UY 1002 Introduction to Civil Engineering](#) 2 Credits
- [CE-UY 2113 Statics](#) 3 Credits
- [CE-UY 2123 Mechanics of Materials](#) 3 Credits
- [CE-UY 2213 Fluid Mechanics and Hydraulics](#) 3 Credits
- [CE-UY 2343 Transportation Engineering](#) 3 Credits
- [CE-UY 3122 Structural Dynamics](#) 2 Credits
- [CE-UY 3133 Structural Analysis](#) 3 Credits
- [CE-UY 3153 Geotechnical Engineering](#) 3 Credits
- [CE-UY 3161 Materials Engineering Laboratory](#) 1 Credits
- [CE-UY 3162 Materials Engineering](#) 2 Credits
- [CE-UY 3173 Structural Design](#) 3 Credits
- [CE-UY 3223 Environmental Engineering I](#) 3 Credits
- [CE-UY 3243 Water Resources Engineering I](#) 3 Credits
- [CE-UY 4092 Leadership, Business Principles, Policy and Ethics in Civil Engineering](#) 2 Credits
- [CE-UY 4153 Structural Design Project](#) 3 Credits
- [CE-UY 4812 Civil Engineering Design I: Site Planning and Design](#) 2 Credits
- [CE-UY 4822 Civil Engineering Design II: Structural Design](#) 2 Credits
- CE-UY X5XX Construction Management and Engineering Electives (See Table 2) 6 Credits
- CE-UY XXXX Civil Engineering Electives (See Table 2) 6 Credits

- CE-UY XXXX Construction Management and Engineering or Civil Engineering Elective (See Table 2) 3 Credits
- CE-UY XXXX Transportation Engineering Elective (See Table 2) 3 Credits

Free Elective

- Free Elective 3 Credits⁴

Total Credits for Degree: 129

Footnotes for Table 1

¹ All students, except those who have earned a grade of 4 or 5 on the Calculus AB or BC AP Exam, take a mathematics placement examination. Students may be placed in an alternative course, which may not carry degree credit, based up the results of such placement examination. Students also may be advance-placed based upon AP or college math credit earned in high school. Students may substitute [MA-UY 1324](#), which includes two additional contact hours, for [MA-UY 1024](#).

² Students may select a basic science elective from one of the following areas: biology, astrophysics and astronomy or geology and earth science.

³ Students must take sixteen credits (four courses) of elective courses in the humanities and social sciences. Consult the Technology, Culture and Society portion of the bulletin for details. At least one humanities and social sciences elective must be a 3xxx/4xxx level course. At least one humanities and social sciences elective must be a writing-intensive course, labeled by "W."

⁴ A free elective is any course in any department of the University for which the student has the prerequisites.

Table 2: Approved Construction Management and Engineering and Civil Engineering Electives

Construction Management and Engineering Electives

- [CE-UY 1502 Leadership and Foundations of Construction Management](#) 2 Credits
- [CE-UY 2504 Construction Modeling and Data Structures I](#) 4 Credits
- [CE-UY 2513 Construction Materials and Methods](#) 3 Credits
- [CE-UY 2523 Contracts and Construction Documents](#) 3 Credits
- [CE-UY 3503 Cost Estimating](#) 3 Credits
- [CE-UY 3513 Construction Scheduling](#) 3 Credits
- [CE-UY 3533 Construction Site Layout and Surveying](#) 3 Credits
- [CE-UY 3553 Non-Structural Building Systems](#) 3 Credits
- [CE-UY 3563 Construction Modeling and Data Structures II](#) 3 Credits

- [CE-UY 4503 Construction Engineering](#) 3 Credits
- [CE-UY 4513 Construction Project Administration](#) 3 Credits
- [CE-UY 4523 Structural Building Systems](#) 3 Credits
- [CE-UY 4533 Construction Law](#) 3 Credits

Civil Engineering Electives

- [CE-UY 4033 Introduction to Urban Infrastructure Systems Management](#) 3 Credits
- [CE-UY 4043 Sustainable Cities](#) 3 Credits
- [CE-UY 4053 Biosoma - Environmental Design of the City of the Future](#) 3 Credits
- [CE-UY 4173 Foundation Engineering](#) 3 Credits
- [CE-UY 4193 Timber and Masonry Structures](#) 3 Credits
- [CE-UY 4253 Hydraulic Systems](#) 3 Credits
- [CE-UY 4273 Environmental Engineering II](#) 3 Credits

Transportation Engineering Electives

- [CE-UY 3313 Introduction to Transportation Systems](#) 3 Credits
- [CE-UY 3303 Traffic Engineering](#) 3 Credits
- [CE-UY 3333 Transportation Systems and Software](#) 3 Credits
- [CE-UY 3353 History of the New York City Transit System](#) 3 Credits
- [CE-UY 3363 Transportation Economics](#) 3 Credits

Note:

Additional electives for CE undergraduates are available from courses in the Construction Management curriculum. Consult the Construction Management section of the catalog.

Typical Course of Study for the Bachelor of Science in Civil Engineering

Freshman Year

Fall Semester: 16 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits

Spring Semester: 16 Credits

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits
- [CE-UY 1002 Introduction to Civil Engineering](#) 2 Credits

Sophomore Year

Fall Semester: 18 Credits

- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [CE-UY 2343 Transportation Engineering](#) 3 Credits
- [CE-UY 2113 Statics](#) 3 Credits
- Humanities and Social Sciences Writing Intensive Elective 4 Credits

Spring Semester: 17 Credits

- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [CE-UY 2123 Mechanics of Materials](#) 3 Credits
- [CE-UY 2213 Fluid Mechanics and Hydraulics](#) 3 Credits
- CE/Construction/TR Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits

Junior Year

Fall Semester: 15 Credits

- [MA-UY 2224 Data Analysis](#) 4 Credits
- [CE-UY 3133 Structural Analysis](#) 3 Credits
- [CE-UY 3122 Structural Dynamics](#) 2 Credits
- [CE-UY 3223 Environmental Engineering I](#) 3 Credits
- Science Elective 3 Credits

Spring Semester: 16 Credits

- [CE-UY 3153 Geotechnical Engineering](#) 3 Credits
- [CE-UY 3173 Structural Design](#) 3 Credits

- [CE-UY 3243 Water Resources Engineering I](#) 3 Credits
- CE/Construction/TR Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits

Senior Year

Fall Semester: 16 Credits

- [CE-UY 4153 Structural Design Project](#) 3 Credits
- [CE-UY 4092 Leadership, Business Principles, Policy and Ethics in Civil Engineering](#) 2 Credits
- [CE-UY 4812 Civil Engineering Design I: Site Planning and Design](#) 2 Credits
- Two (2) CE/Construction/TR Elective 6 Credits
- Free Elective I 3 Credits

Spring Semester: 15 Credits

- [CE-UY 4822 Civil Engineering Design II: Structural Design](#) 2 Credits
- [CE-UY 3162 Materials Engineering](#) 2 Credits
- [CE-UY 3161 Materials Engineering Laboratory](#) 1 Credits
- Two (2) CE/Construction/TR Elective 6 Credits total
- Humanities and Social Sciences Elective 4 Credits

Total credits required for graduation: 129

Computer Engineering, B.S.

Typical Course of Study for the Bachelor of Science in Computer Engineering

Freshman Year

Fall Semester: 16 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits²
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits¹
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits¹
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits

Spring Semester: 17 Credits

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [CS-UY 1134 Data Structures and Algorithms](#) 4 Credits²

Note: Students who entered NYU Tandon prior to FA16 may take [CS-UY 2134 Data Structures and Algorithms](#) instead of CS-UY 1134.

- [EE-UY 1012 Introduction to Computer Engineering](#) 2 Credits¹
OR
- [CS-UY 1012 Introduction to Computer Engineering](#) 2 Credits¹
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits

Sophomore Year

Fall Semester: 18 Credits

- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- CS-UY 2124 Object Oriented Programming 4 Credits²

Note: Students who entered NYU Tandon prior to FA16 may take [CS-UY 1124 Object Oriented Programming](#) instead of CS-UY 2124.

- [EE-UY 2013 Fundamentals of Electric Circuits I](#) 3 Credits²
- Free Elective 3 Credits

Spring Semester: 16 Credits

- [MA-UY 2314 Discrete Mathematics](#) 4 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [CS-UY 2204 Digital Logic and State Machine Design](#) 4 Credits²
- [EE-UY 2024 Fundamentals of Electric Circuits II](#) 4 Credits²

Junior Year

Fall Semester: 17 Credits

- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [CS-UY 2214 Computer Architecture and Organization](#) 4 Credits
- [EE-UY 3114 Fundamentals of Electronics I](#) 4 Credits
- [EE-UY 4001 ECE Professional Development and Presentation](#) 1 Credits

Spring Semester: 14/16 Credits

- [MA-UY 2224 Data Analysis](#) 4 Credits
- Humanities and Social Sciences Elective Course 4 Credits³
- EE/CS Restricted Elective 3/4 Credits⁴
- EE/CS Restricted Elective 3/4 Credits⁴

Senior Year

Fall Semester: 17/18 Credits

- EE/CS 4XX3 Design Project I 3 Credits
- Humanities and Social Sciences Elective Course 4 Credits³
- Humanities and Social Sciences Elective Course 4 Credits³
- EE/CS Restricted Elective 3/4 Credits⁴
- Free Elective 3 Credits

Spring Semester: 16/17 Credits

- EE/CS 4XX3 Design Project II 3 Credits
- EE/CS Restricted Elective 3/4 Credits⁴
- EE/CS/EL Elective 3 Credits
- EE/CS/EL Elective 3 Credits
- Humanities and Social Sciences Elective Course 4 Credits³

Total credits required for graduation: 128

Notes

Note: A GPA (Technical) of at least 2.0 is required in all EE, CS and EL courses.

¹ For transfer students and students changing major, [CS-UY 1012 Introduction to Computer Engineering](#) is not required. [EG-UY 1001 Engineering and Technology Forum](#) and [EG-UY 1003 Introduction to Engineering and Design](#) may also be excused depending upon transfer credits.

² Grades of at least C- are required in [CS-UY 1114](#), [CS-UY 1124/CS-UY 1134](#), CS-UY 2124/[CS-UY 2134](#), [CS-UY 2204](#), [EE-UY 2013](#) and [EE-UY 2024](#). C if repeated twice.

³ Choice of humanities and social sciences electives must conform to the established requirements of the Technology, Culture and Society Department. After the first-year writing courses, students will need **one writing intensive elective course (W)**. In addition, one of the four courses **must be a Junior or Senior-level course**.

⁴ An EE/CS restricted elective is any course that a student has the pre-requisites for and is on the list of EE/CS Restricted Electives announced by the Computer Science and Electrical Engineering Departments. Students must choose two (2) CS courses and two (2) EE courses from the list of Restricted Electives which is updated by the two departments.

Computer Science and Computer Engineering (Dual Major), B.S.

With departmental permission, students may earn a single bachelor's degree in computer science and computer engineering. This degree requires a total 140 credits rather than the usual 128 required for individual bachelor's degrees.

Note: A GPA (technical) of at least 2.0 is required in all EE-UY, CS-UY and EL-GY courses.

Typical Course of Study for the Bachelors of Science in Computer Science and Computer Engineering (dual major)

First Year

Fall Semester: 16 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits ¹
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits ¹
- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits ²
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits

Spring Semester: 17 Credits

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [CS-UY 1134 Data Structures and Algorithms](#) 4 Credits ²
Note: Students who entered NYU Tandon prior to FA16 may take [CS-UY 2134 Data Structures and Algorithms](#) instead of CS-UY 1134.
- [CS-UY 1122 Introduction to Computer Science](#) 2 Credits OR [EE/CS 1012 Introduction to Computer Engineering](#) 2 Credits ¹
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits

Second Year

Fall Semester: 19 Credits

- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [MA-UY 2314 Discrete Mathematics](#) 4 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [CS-UY 2124 Object Oriented Programming](#) 4 Credits ²

Note: Students who entered NYU Tandon prior to FA16 may take [CS-UY 1124 Object Oriented Programming](#) instead of CS-UY 2124.

- [EE-UY 2013 Fundamentals of Electric Circuits I](#) 3 Credits ²

Spring Semester: 16 Credits

- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [CS-UY 2204 Digital Logic and State Machine Design](#) 4 Credits ²
- [EE-UY 2024 Fundamentals of Electric Circuits II](#) 4 Credits ²

Third Year

Fall Semester: 20 Credits

- [MA-UY 2224 Data Analysis](#) 4 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [CS-UY 2214 Computer Architecture and Organization](#) 4 Credits
- [EE-UY 3114 Fundamentals of Electronics I](#) 4 Credits
- [PL-UY 2144 Ethics and Technology](#) 4 Credits ³

Spring Semester: 16/19 Credits

- [CS-UY 2413 Design and Analysis of Algorithms](#) 3 Credits
- EE/CS Restricted Elective 3/4 Credits ⁴
- EE/CS Restricted Elective 3/4 Credits ⁴
- EE/CS Restricted Elective 3/4 Credits ⁴
- Humanities and Social Sciences Elective 4 Credits ³

Fourth Year

Fall Semester: 17/18 Credits

- [EE-UY 4001 ECE Professional Development and Presentation](#) 1 Credit
- EE-UY 4XX3 Design Project I 3 Credits OR [CS-UY 4513 Software Engineering](#) 3 Credits ⁵
- CS Elective 3 Credits OR [CS-UY 4513 Software Engineering](#) 3 Credits ⁵
- EE/CS Restricted Elective 3/4 Credits ⁴
- EE/CS/EL Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits ³

Spring Semester: 19/20 Credits

- EE-UY 4XX3 Design Project II 3 Credits OR [CS-UY 4523 Design Project](#) 3 Credits
- CS Elective 3 Credits
- EE/CS/EL Elective 3 Credits
- EE/CS Restricted Elective 3/4 Credits ⁴
- Humanities and Social Sciences Elective 4 Credits ³
- Free Elective 3 Credits

Total Credits Required for the Degree: 140

Notes

A GPA (Technical) of at least 2.0 is required in all EE, CS and EL courses.

¹For transfer students and students changing major, “Introduction to Computer Engineering” is not required. [EG-UY 1001 Engineering and Technology Forum](#) and [EG-UY 1003 Introduction to Engineering and Design](#) may also be excused depending upon transfer credits.

²Grades of at least C- are required in [CS-UY 1114](#), [CS-UY 1124/CS-UY 1134](#), CS-UY 2124/[CS-UY 2134](#), [CS-UY 2204](#), [EE-UY 2013](#) and [EE-UY 2024](#). C if repeated twice.

³Choice of HuSS electives must conform to the established requirements of the Technology, Culture and Society Department. After the first-year writing courses, students will need **one writing intensive elective course (W)**. In addition, one of the four courses must be a Junior or Senior-level course. Finally, students should take either [PL-UY 2144 Ethics and Technology](#) or any ethics course with approval of advisor.

⁴An EE/CS restricted elective is any course that a student has the prerequisites for and is on the list of EE/CS Restricted Electives announced by the Computer Science and Electrical Engineering Departments. Students must choose at least two (2) EE courses and one CS or EE course from the list of Restricted Electives which is updated by the two departments.

⁵All students must take Software Engineering. Students interested in a CS-oriented project take [CS-UY 4523](#) afterwards. Otherwise, students take EE 4xx3, EE 4xx3, (Design Project I and II) and [CS-UY 4513 Software Engineering](#) in a CS Elective slot.

Computer Science, B.S.

Undergraduate Program

Computer science focuses on how to design, build, and effectively use the computers and systems that we interact with every day from the smart phones in our hands to the complex databases in our banks and hospitals. Because computer technology powers the most essential functions of business, industry, government and entertainment, computer scientists have tremendous opportunities for growth and exploration.

In addition to the BS degree in Computer Science, the Computer Science and Engineering department offers minors in [Computer Science](#), [Cybersecurity](#), and [Game Engineering](#), and a [dual degree in Computer Science and Computer Engineering](#). The NYU Tandon School of Engineering also offers a BS/MS Program that enables students to earn both a BS and an MS degree at the same time. For instance, a student can receive a BS in Computer Science and MS in Computer Science, a BS in Computer Engineering and MS in Computer Science, or a BS in Electrical Engineering and MS in Computer Science. Depending on the student's preparation and objectives, they can complete both degrees in as little as four years. More information on the BS/MS program can be found on the "[Undergraduate Academic Requirements and Policies](#)" section of the catalog.

The program provides research labs for specialized study in areas such as cybersecurity, game engineering, and big data, areas in which our department has a distinctive strength. In addition, the program's close ties to our graduate division immerse students in a vibrant, intellectual atmosphere.

Goals and Objectives

With the BS program in Computer Science, the department aims to:

- Provide a deep understanding of fundamental computer science subjects;
- Provide avenues of specialization, such as digital games, cybersecurity, and computer systems;
- Achieve a proper balance between theoretical study and practical design in order to solve problems effectively;
- Supplement technical skills with courses in humanities, social science, and business; and
- Provide opportunities for excellent students to pursue independent study, as well as directed research, with faculty members who are internationally recognized in their fields.

Curriculum Overview

Below is an overview of the Computer Science BS curriculum. A typical course schedule is located at the end of this section.

Computer Science Introductory Sequence

- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits
- [CS-UY 1134 Data Structures and Algorithms](#) 4 Credits

- [CS-UY 2124 Object Oriented Programming](#) 4 Credits

Note: Students who entered NYU Tandon prior to FA16 may take [CS-UY 1124 Object Oriented Programming](#) and [CS-UY 2134 Data Structures and Algorithms](#) instead of CS-UY 1134 and CS-UY 2124.

Other Required Computer Science Courses

- [CS-UY 1122 Introduction to Computer Science](#) 2 Credits
- [CS-UY 2214 Computer Architecture and Organization](#) 4 Credits
- [CS-UY 3224 Operating Systems](#) 4 Credits
- [CS-UY 2413 Design and Analysis of Algorithms](#) 3 Credits
- [CS-UY 4513 Software Engineering](#) 3 Credits
- [CS-UY 4523 Design Project](#) 3 Credits

Required Mathematics Courses

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [MA-UY 2314 Discrete Mathematics](#) 4 Credits
- [MA-UY 2224 Data Analysis](#) 4 Credits

Note: [MA-UY 914 Precalculus for Engineers](#) does not count toward the Math requirement.

Required Engineering Courses

- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits

Science Requirement

Students may choose any three natural science courses (each at least 3 credits) offered by the NYU Tandon School of Engineering, provided that they meet pre-requisites and co-requisites:

- [BMS-UY 1004 Introduction to Cell and Molecular Biology](#) 4 Credits
- [BMS-UY 2004 Introduction to Physiology](#) 4 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [CM-UY 1014 General Chemistry I](#) 4 Credits
- [CM-UY 1024 General Chemistry II](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits and [PH-UY 2121 General Physics Laboratory I](#) 1 Credit
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits and [PH-UY 2131 General Physics Laboratory II](#) (1 Credit)

Humanities and Social Sciences Requirement

Students are required to take six courses in humanities and social sciences. Two of these courses are specified below; the remaining four courses are electives, one of which must be a writing-intensive course (denoted by a “W” in the course number) and one must be an ethics course.

- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- Any Ethics course 4 credits

Electives

- 18 additional credits in computer science electives ⁴
- 26 credits of free electives ⁴

Note: *NYU SPS courses are not accepted as free electives.*

Typical Course of Study for the Bachelor of Science in Computer Science

Freshman Year

Fall Semester: 16 Credits

- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits ¹
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits ²
- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits ³
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits

Spring Semester: 17 Credits

- [CS-UY 1134 Data Structures and Algorithms](#) 4 Credits ¹
- [CS-UY 1122 Introduction to Computer Science](#) 2 Credits
- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- Science Elective 3 Credits ³

Sophomore Year

Fall Semester: 15 Credits

- CS-UY 2124 Object Oriented Programming 4 Credits ¹
- [MA-UY 2314 Discrete Mathematics](#) 4 Credits
- Science Elective 3 Credits ⁴
- Humanities and Social Sciences Elective 4 Credits ⁵

Spring Semester: 15 Credits

- [CS-UY 2214 Computer Architecture and Organization](#) 4 Credits
- [CS-UY 2413 Design and Analysis of Algorithms](#) 3 Credits
- [MA-UY 2224 Data Analysis](#) 4 Credits ⁷
- Humanities and Social Sciences Elective 4 Credits ⁵

Junior Year

Fall Semester: 17 Credits

- [CS-UY 3224 Operating Systems](#) 4 Credits
- CS Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits ⁵
- Science Elective 3 Credits ⁴
- Free Elective 3 Credits

Spring Semester: 16 Credits

- CS Elective 3 Credits
- CS Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits ⁵
- Free Elective 3 Credits
- Free Elective 3 Credits

Senior Year

Fall Semester: 16 Credits

-
- [CS-UY 4513 Software Engineering](#) 3 Credits
 - CS Elective 3 Credits
 - CS Elective 3 Credits
 - Free Elective 3 Credits
 - Free Elective 4 Credits

Spring Semester: 16 Credits

- CS-UY 4523 Design Project 3 Credits
- CS Elective 3 Credits
- Free Elective 4 Credits
- Free Elective 3 Credits
- Free Elective 3 Credits

Total credits required for graduation: 128

Footnotes

¹ Grade of C- or better is required in [CS-UY 1114](#), [CS-UY 1124/CS-UY 1134](#), and CS-UY 2124/[CS-UY 2134](#).

² Students who are placed by examination or by an adviser into [MA-UY 914](#) must defer registration for [MA 1024](#).

³ The Science electives may be chosen from any of the following natural sciences (Physics, Biology, and Chemistry). Many science courses are 4 credits or require co-requisite lab.

⁴ With approval of the CSE department, certain closely related courses in EE, Math or other related disciplines may be substituted for CS electives. A list of approved substitutions is available in the CSE department.

⁵ At least one Humanities and Social Sciences elective must be a Writing-intensive course. Writing-intensive Humanities and Social Sciences courses are designated by "W." In addition, one Humanities and Social Sciences elective must be a 3XXX or 4XXX level. [Approved Humanities and Social Sciences electives](#) span three clusters: CAM, STS and SEG. Students are encouraged to take Humanities and Social Sciences electives across clusters and/or disciplines within a cluster.

Construction Management, B.S.

Undergraduate Program

The Bachelor of Science in Construction Management is an interdisciplinary program in the Department of Civil and Urban Engineering. The program prepares students for a challenging career in the construction industry-as future leaders in a dynamic and ever-changing environment. It concentrates on the skills and understanding necessary to excel as a construction management professional and to compete in the marketplace. Graduates are engaged by owners, developers, construction managers, contractors, architects and engineers, lenders and other construction industry participants.

The Bachelor of Science in Construction Management program covers a broad range of subjects in engineering and construction management, such as planning, cost estimating, scheduling, project management and construction administration. The program also exposes students to the latest applications in construction research and technology. The program teaches students the fundamentals of engineering and construction science, as well as business aspects of construction and the application of traditional and emerging construction methods and technologies. Students also study basic economics, accounting and management principles.

Courses and projects in the program's junior and senior years illustrate current project management principles and methods by using materials from, and site visits to, construction projects led by experienced mentors.

Beyond the classroom, real-world work experience is available through internships and summer and part-time employment and through professional organizations and associated student chapters, including the Construction Management Association of America (CMAA), the Associated Schools of Construction (ASC), the American Society of Civil Engineers (ASCE), the Society of American Military Engineers (SAME) and the New York Building Congress (NYBC). NYU's Career Management Center also supports these efforts.

Goals and Objectives

The objective of the Bachelor of Science in Construction Management is to provide the following for its students:

- A solid foundation of knowledge in mathematics and the basic sciences as applied to construction management.
- The knowledge and skills to excel at an entry-level position as a construction professional and/or continue graduate study in construction management or a related field.
- The necessary written and oral communications skills to enable graduates to pursue leadership opportunities.
- A thorough understanding of state-of-the-art techniques and tools in construction management involving three-dimensional computer modeling, building information modeling (BIM), integration of information technology and the application of innovative planning, design and construction administration methodologies.
- A broad education in preparation for lifelong learning and individual growth. Students are required

to take courses in writing and the humanities. Electives allow students to further customize their education to enhance individual interests.

Student Outcomes

Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program. The Department has adopted the eleven (11) fundamental outcomes specified by ABET, as they cover the full breadth and depth of the abilities and skills needed:

- (a) an ability to apply knowledge of mathematics, science, and applied sciences;
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data;
- (c) an ability to formulate or design a system, process, or program to meet desired needs;
- (d) an ability to function on multidisciplinary teams;
- (e) an ability to identify and solve applied science problems;
- (f) an understanding of professional and ethical responsibility;
- (g) an ability to communicate effectively;
- (h) the broad education necessary to understand the impact of solutions in a global and societal context;
- (i) a recognition of the need for and an ability to engage in life-long learning;
- (j) a knowledge of contemporary issues; and
- (k) an ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice.

Curriculum

The Bachelor of Science in Construction Management program is advised by a Department Industry Advisory Board, comprising leaders from the engineering and construction professions to help assess and update the program curriculum. The general requirements of the curriculum accommodate the continually expanding requirements of the profession, advancements in knowledge and the contributions of related disciplines.

Table 1 summarizes the Construction Management curriculum by subject category. A typical four-year schedule for the program is included at the end of this section of the bulletin.

Table 1: Curriculum for the BS in Construction Management

Required Courses in Mathematics: 12 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits ¹
 - MA Mathematics Elective 4 Credits ²
 - [MA-UY 2054 Applied Business Data Analysis I](#) 4 Credits
- or
- [MA-UY 2224 Data Analysis](#) 4 Credits

Required Courses in the Physical Sciences: 7 Credits

- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits

Required Courses in Humanities and Social Sciences: 24 Credits

- [EXPOS-UA 1 Writing the Essay](#) 4 Credits ³
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits ³
- Humanities/Social Sciences Electives 16 Credits ⁴

Required Courses in Business and Management: 16 Credits

See Footnote ⁵

- [MG-UY 2204 Financial Accounting](#) 4 Credits
- or
- [FIN-UY 2103 Creating and Understanding Financial Statements](#) 3 Credits
- [FIN-UY 2003 Economic Foundations of Finance](#) 3 Credits
- or
- Level II Elective in Economics 3 or 4 Credits
- MG/EC/FIN Level II Electives *Various Credits*
- MG/EC/FIN Level III Electives *Not less than 5 Credits*

Required Courses in Civil Engineering: 9 Credits

- [CE-UY 2113 Statics](#) 3 Credits
- [CE-UY 2123 Mechanics of Materials](#) 3 Credits
- CE Elective 3 Credits ⁶

Required Courses in Construction Management: 43 Credits

- [CE-UY 1502 Leadership and Foundations of Construction Management](#) 2 Credits
- [CE-UY 2504 Construction Modeling and Data Structures I](#) 4 Credits
- [CE-UY 2513 Construction Materials and Methods](#) 3 Credits
- [CE-UY 2523 Contracts and Construction Documents](#) 3 Credits
- [CE-UY 3161 Materials Engineering Laboratory](#) 1 Credits
- [CE-UY 3503 Cost Estimating](#) 3 Credits
- [CE-UY 3513 Construction Scheduling](#) 3 Credits
- [CE-UY 3533 Construction Site Layout and Surveying](#) 3 Credits
- [CE-UY 3553 Non-Structural Building Systems](#) 3 Credits
- [CE-UY 3563 Construction Modeling and Data Structures II](#) 3 Credits
- [CE-UY 4503 Construction Engineering](#) 3 Credits
- [CE-UY 4513 Construction Project Administration](#) 3 Credits
- [CE-UY 4523 Structural Building Systems](#) 3 Credits

- [CE-UY 4533 Construction Law](#) 3 Credits
- [CE-UY 4543 Construction Management Project](#) 3 Credits

Other Required Courses: 18 Credits

- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits
- Liberal Arts and Sciences Elective 8 Credits
- See footnote 8

Total Credits for Degree: 128 Credits

Footnotes for Table 1

¹ Students may substitute [MA-UY 1324](#), which includes two additional contact hours, for [MA-UY 1024](#).

² The department recommends that students take [MA-UY 1124 Calculus II for Engineers](#) (or [MA-UY 1424 Integrated Calculus II for Engineers](#)) as the MA Elective.

³ All students take a writing placement examination. Students for whom English is a second language may be placed in an ESL section, which includes additional hours of language education. Students also may be placed in a remedial section, based upon the exam results, which may or may not carry degree credit.

⁴ Student must complete 16 additional credits in Humanities and Social Sciences. At least one elective shall contain at least one credit of ethics. At least one elective must be a 3xxx/4xxx level course. At least one elective must be a writing-intensive course, labeled by "W."

⁵ Students are required to complete 16 credits of Business and Management courses, with at least two courses (5 credits) from level III or higher courses. (One additional business and management credit is attributed to [CE-UY 4533 Construction Law](#)). A level II course has a 2xxx number, while a level III course has a 3xxx number. Level III electives generally have a prerequisite of a related level II elective. Since courses may be three or four credits, the number of courses necessary to complete this requirement may vary.

⁶ CE elective is any non-construction management course with a CE prefix for which the student has the approved prerequisites.

⁷ Students must complete 60 credits in liberal arts and sciences, which includes mathematics, physical sciences and humanities and social sciences.

⁸ Two unallocated credits may be satisfied by additional credits in any subject area courses.

Typical Course of Study for the Bachelor of Science in Construction Management

Freshman Year

Fall Semester: 16 Credits

- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits

Spring Semester: 16 Credits

- [PH-UY 1013 Mechanics](#) 3 Credits
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits
- [CE-UY 1502 Leadership and Foundations of Construction Management](#) 2 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits

Sophomore Year

Fall Semester: 17/18 Credits

- [CE-UY 2113 Statics](#) 3 Credits
- [CE-UY 2504 Construction Modeling and Data Structures I](#) 4 Credits
- [CE-UY 2513 Construction Materials and Methods](#) 3 Credits
- [MG-UY 2204 Financial Accounting](#) 4 Credits
- or
[FIN-UY 2103 Creating and Understanding Financial Statements](#) 3 Credits
- Humanities and Social Science Elective 4 Credits

Spring Semester: 17/18 Credits

- [CE-UY 2123 Mechanics of Materials](#) 3 Credits
- [CE-UY 2523 Contracts and Construction Documents](#) 3 Credits
- [FIN-UY 2003 Economic Foundations of Finance](#) 3 Credits
- Or
EC Level II Elective in Economics 3 or 4 Credits
- [MA-UY 2054 Applied Business Data Analysis I](#) 4 Credits
- Humanities and Social Sciences Elective 4 Credits

Junior Year

Fall Semester: 16/17 Credits

- [CE-UY 3503 Cost Estimating](#) 3 Credits
- [CE-UY 3513 Construction Scheduling](#) 3 Credits
- [CE-UY 3533 Construction Site Layout and Surveying](#) 3 Credits
- MG/EC/FIN Level II Elective 3 or 4 Credits
- Humanities and Social Sciences Elective 4 Credits

Spring Semester: 14/15 Credits

- [CE-UY 3553 Non-Structural Building Systems](#) 3 Credits
- [CE-UY 3563 Construction Modeling and Data Structures II](#) 3 Credits
- [CE-UY 3161 Materials Engineering Laboratory](#) 1 Credits
- Liberal Arts and Sciences Elective 4 Credits
- MG/EC/FIN Level II Elective 3 or 4 Credits

Senior Year

Fall Semester: 14-18 Credits

- [CE-UY 4513 Construction Project Administration](#) 3 Credits
- [CE-UY 4523 Structural Building Systems](#) 3 Credits
- Civil Engineering Elective 2, 3, or 4 Credits
- MG/EC/FIN Level III Elective 2, 3, or 4 Credits
- Humanities and Social Sciences Elective 4 Credits

Spring Semester: 16/17 Credits

- [CE-UY 4503 Construction Engineering](#) 3 Credits
- [CE-UY 4533 Construction Law](#) 3 Credits
- [CE-UY 4543 Construction Management Project](#) 3 Credits
- MG/EC/FIN Level III Elective 3 or 4 Credits
- Liberal Arts and Sciences Elective 4 Credits

Total credits required for the degree: 128

Electrical and Computer Engineering (Dual Major), B.S.

With departmental permission, students may earn a single bachelor's degree in electrical and computer engineering. This degree requires a total 141 credits rather than the usual 128 required for individual bachelor's degrees.

Note: A GPA (technical) of at least 2.0 is required in all EE-UY, CS-UY and EL-GY courses.

Typical Course of Study for the Bachelors of Science in Electrical Engineering and Computer Engineering (dual major)

(For students beginning September 2014 or later. Notes indicated by superscripts are listed at the end of the table.)

First Year

Fall Semester: 16 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits ¹
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits ¹
- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits ²
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits

Spring Semester: 17 Credits

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [EE/CS 1012 Introduction to Computer Engineering](#) 2 Credits **OR** [EE-UY 1002 Introduction to Electrical Engineering](#) 2 Credits ¹
- [CS-UY 1134 Data Structures and Algorithms](#) 4 Credits ²
Note: Students who entered NYU Tandon prior to FA16 may take [CS-UY 2134 Data Structures and Algorithms](#) instead of CS-UY 1134.
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits

Second Year

Fall Semester: 19 Credits

- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits

- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- CS-UY 2124 Object Oriented Programming 4 Credits ²

Note: Students who entered NYU Tandon prior to FA16 may take [CS-UY 1124 Object Oriented Programming](#) instead of CS-UY 2124.

- [EE-UY 2013 Fundamentals of Electric Circuits I](#) 3 Credits ²
- Humanities and Social Sciences Elective 4 Credits³

Spring Semester: 20 Credits

- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [MA-UY 2314 Discrete Mathematics](#) 4 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [CS-UY 2204 Digital Logic and State Machine Design](#) 4 Credits ²
- [EE-UY 2024 Fundamentals of Electric Circuits II](#) 4 Credits ²

Third Year

Fall Semester: 18 Credits

- [MA-UY 3113 Advanced Linear Algebra and Complex Variables](#) 3 Credits
- [EE-UY 2233 Introduction to Probability](#) 3 Credits OR
- [MA-UY 2233 Introduction to Probability](#) 3 Credits
- [EE-UY 3114 Fundamentals of Electronics I](#) 4 Credits
- [CS-UY 2214 Computer Architecture and Organization](#) 4 Credits
- [EE-UY 3054 Signals and Systems](#) 4 Credits

Spring Semester: 18-20 Credits

- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [EE-UY 3604 Electromagnetic Waves](#) 4 Credits
- Humanities and Social Sciences Elective 4 Credits³
- EE/CS Restricted Elective 3/4 Credits ⁴
- EE/CS Restricted Elective 3/4 Credits ⁴

Fourth Year

Fall Semester: 17/19 Credits

- [EE-UY 4001 ECE Professional Development and Presentation](#) 1 Credits
- EE/CS 4XX3 Design Project I 3 Credits
- EE/CS Restricted Elective 3/4 Credits⁴
- EE/CS Restricted Elective 3/4 Credits ⁴

- Free Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits³

Spring Semester: 16/17 Credits

- EE/CS 4XX3 Design Project II 3 Credits
- EE/CS/EL Elective 3 Credits
- EE/CS/EL Elective 3 Credits
- EE/CS Restricted Elective 3/4 Credits⁴
- Humanities and Social Sciences Elective 4 Credits³

Total Credits Required for the Degree: 141

Notes

1. For transfer students and students changing their major, "Introduction to Computer Engineering" is not required. [EG-UY 1001 Engineering and Technology Forum](#) and [EG-UY 1003 Introduction to Engineering and Design](#) may also be excused depending on transfer credits.
2. Grades of at least C- are required in [CS-UY 1114](#), [CS-UY 1124/CS-UY 1134](#), CS-UY 2124/[CS-UY 2134](#), [CS-UY 2204](#), [EE-UY 2013](#), [EE-UY 2024](#) and [EE-UY 3054](#). C if repeated twice.
3. Choice of a HuSS electives must conform to the established requirements of the Technology, Culture and Society Department. After the first-year writing sequence, students will need **one writing intensive course (W)**. In addition, one of the four courses must be a **Junior or Senior level course**.
4. An EE/CS restricted elective is any course that a student has the pre-requisites for and is on the list of EE/CS Restricted Electives announced by the Computer Science and Engineering and Electrical and Computer Engineering Departments or on the list of EE Special Electives announced by the Electrical and Computer Engineering Department.
 - Students must choose at least two (2) courses from the EE Special Electives list.
 - Among the remaining three, students must one (1) CS course, one (1) EE course, and one from CS or EE from the set of CS Restricted Electives and EE Restricted Electives both of which are updated by the two departments.

Electrical Engineering, B.S.

Typical Course of Study for the Bachelor of Science in Electrical Engineering

Freshman Year

Fall Semester: 15 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits ⁴
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits

Spring Semester: 17 Credits

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [EE-UY 1002 Introduction to Electrical Engineering](#) 2 Credits ¹
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits

Sophomore Year

Fall Semester: 15 Credits

- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [EE-UY 2013 Fundamentals of Electric Circuits I](#) 3 Credits ⁴
- [CS-UY 2204 Digital Logic and State Machine Design](#) 4 Credits ⁴

Spring Semester: 16 Credits

- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [EE-UY 2024 Fundamentals of Electric Circuits II](#) 4 Credits ⁴
- [CS-UY 2164 Introduction to Programming in C](#) 4 Credits

Junior Year

Fall Semester: 18 Credits

- [MA-UY 3113 Advanced Linear Algebra and Complex Variables](#) 3 Credits
- [EE-UY 2233 Introduction to Probability](#) 3 Credits
- [EE-UY 3054 Signals and Systems](#) 4 Credits⁴
- [EE-UY 3114 Fundamentals of Electronics I](#) 4 Credits
- Humanities and Social Sciences Course 4 Credits²

Spring Semester: 16 Credits

- [EE-UY 3604 Electromagnetic Waves](#) 4 Credits
- EE Restricted Elective 4 Credits³
- EE Restricted Elective 4 Credits³
- Humanities and Social Sciences Course 4 Credits²

Senior Year

Fall Semester: 15 Credits

- EE 4XX3 Design Project I 3 Credits
- [EE-UY 4001 ECE Professional Development and Presentation](#) 1 Credits
- EE Restricted Elective 4 Credits³
- EE/EL Elective 3 Credits
- Humanities and Social Sciences Course 4 Credits²

Spring Semester: 16/17 Credits

- EE 4XX3 Design Project II 3 Credits
- EE/EL Elective 3 Credits
- EE/CS/EL Elective 3 Credits
- Free Elective 3-4 Credits
- Humanities and Social Sciences Course 4 Credits²

Total credits required for the degree: 128

Footnotes

¹ For transfer students and students changing major, EE-UY 1002 is not required.

² Choice of Humanities and Social Sciences courses must conform to university requirements.

³ The Restricted Electives must be 3 of 4 courses:

- EE-UY 3124 Fundamentals of Electronics II
- EE-UY 3824 Electric Energy Conversion Systems
- EE-UY 3404 Fundamentals of Communication Theory
- EE-UY 3064 Feedback Control

⁴ A grade of at least C- is required in CS-UY 1133, CS-UY 2204, EE-UY 2013, EE-UY 2024, and EE-UY 3054.

⁵ Three 4-credit electives may be used in place of four 3-credit electives.

Integrated Digital Media, B.S.

Bachelor of Science Degree Requirements

Digital Media Core: 42 Credits

- [DM-UY 1113 Audio Foundation Studio](#) 3 Credits
- [DM-UY 1123 Visual Foundation Studio](#) 3 Credits
- [DM-UY 1133 Creative Coding](#) 3 Credits
- [DM-UY 1143 Ideation & Prototyping](#) 3 Credits
- [DM-UY 2193 Intro to Web Development](#) 3 Credits
- [DM-UY 2263 Still and Moving Images](#) 3 Credits
- [DM-UY 4003 Senior Project in Digital Media](#) 3 Credits
- [DM-UY 4173 Professional Practices](#) 3 Credits
- DM-UY 2/3/4XXX DM Studio Electives 18 Credits
or
- DM-UY 2/3/4XXX DM Studio Electives 15 credits and DM-UY 4034 Internship 4 credits

Math, Science, Humanities, and Social Sciences: 60 Credits

- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- Humanities/Math/Natural Science Electives 25 Credits
- [MA-UY 2414 Basic Practice of Statistics](#) 4 Credits
- MCC-UE 0001 Introduction to Media Studies 4 Credits or MCC-UE 0003 History of Media and Communication 4 Credits
- [MD-UY 2314 Interactive Narrative](#) 4 Credits
- [PH-UY 1213 Motion and Sound](#) 3 Credits
- [PH-UY 1223 Electricity and Light](#) 3 Credits
- Select one course from either of the following fields of studies with the EXCEPTION of MCC-UE 1029 New Media Research Studio; MCC-UE 1031 Digital Media Theory and Practice; MCC-UE 1585 Creative Coding.
 - Technology and Society
 - Interaction and Social Processes4 Credits

Free Electives: 18 Credits

Total: 120 Credits

Typical Course of Study for the Bachelor of Science in Integrated Digital Media (POSSIBLE OUTLINE)

Freshman Year

Fall Semester: 14 Credits

- [DM-UY 1113 Audio Foundation Studio](#) 3 Credits
- [DM-UY 1123 Visual Foundation Studio](#) 3 Credits
- [DM-UY 2193 Intro to Web Development](#) 3 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits

Spring Semester: 17 Credits

- [PH-UY 1213 Motion and Sound](#) 3 Credits
- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [DM-UY 1133 Creative Coding](#) 3 Credits
- [DM-UY 1143 Ideation & Prototyping](#) 3 Credits

Sophomore Year

Fall Semester: 17 Credits

- DM 2/3/4xxx DM Studio Elective 3 Credits
- Math, Science, Humanities Elective 4 Credits
- [DM-UY 2263 Still and Moving Images](#) 3 Credits
- Math, Science, Humanities Elective 4 Credits
- [PH-UY 1223 Electricity and Light](#) 3 Credits

Spring Semester: 15 Credits

- DM 2/3/4xxx DM Studio Electives 3 Credits
- [MD-UY 2314 Interactive Narrative](#) 4 Credits
- MCC-UE 0001 Introduction to Media Studies 4 Credits or MCC-UE 0003 History of Media and Communication 4 Credits
- [MA-UY 2414 Basic Practice of Statistics](#) 4 Credits

Junior Year

Fall Semester: 14 Credits

- DM 2/3/4xxx DM Studio Electives 3 Credits
- Math, Science, Humanities Elective 3 Credits
- Math, Science, Humanities Elective 4 Credits
- Free Elective 4 Credits

Spring Semester: 15 Credits

- DM 2/3/4xxx DM Studio Electives 3 Credits **or** DM-UY 4033 Internship 3 Credits
- Math, Science, Humanities Elective 4 Credits
- Free Elective 4 Credits
- Select one course from either of the following fields of studies with the EXCEPTION of MCC-UE 1029 New Media Research Studio; MCC-UE 1031 Digital Media Theory and Practice; MCC-UE 1585 Creative Coding. 4 Credits
 1. Technology and Society
 2. Interaction and Social Processes

*http://steinhardt.nyu.edu/mcc/undergraduate/fields_of_study

Senior Year

Fall Semester: 14 Credits

- DM 2/3/4xxx DM Studio Electives 3 Credits
- DM 2/3/4xxx DM Studio Electives 3 Credits
- Math, Science, Humanities Elective 4 Credits
- Free Elective 4 Credits

Spring Semester: 14 Credits

- [DM-UY 4003 Senior Project in Digital Media](#) 3 Credits
- [DM-UY 4173 Professional Practices](#) 3 Credits
- Math, Science, Humanities Elective 4 Credits
- Free Elective 4 Credits

Total: 120 Credits

Mathematics, B.S.

Requirements for the Bachelor of Science

Department Courses

- [MA-UY 1002 The Art of Mathematics](#) 2 Credits
- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- or
- [MA-UY 1324 Integrated Calculus I for Engineers](#) 4 Credits
- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- or
- [MA-UY 1424 Integrated Calculus II for Engineers](#) 4 Credits
- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [MA-UY 2224 Data Analysis](#) 4 Credits
- [MA-UY 2314 Discrete Mathematics](#) 4 Credits
- [MA-UY 3022 Probability Theory II](#) 2 Credits
- [MA-UY 3113 Advanced Linear Algebra and Complex Variables](#) 3 Credits
- [MA-UY 3914 Project in Mathematics I](#) 4 Credits
(May be substituted by another course with adviser's approval)
- [MA-UY 4413 Applied Partial Differential Equations](#) 3 Credits
(May be substituted by another course with adviser's approval)
- [MA-UY 4423 Introductory Numerical Analysis](#) 3 Credits
- [MA-UY 4613 Analysis I](#) 3 Credits
- [MA-UY 4623 Analysis II](#) 3 Credits
- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- Concentration 18 Credits *
- Humanities/Social Science electives 20 Credits
- Free electives, with adviser's approval 15 Credits

Total: 127 Credits

Note:

*These consist of at least 9 credits in a single area of study other than mathematics and beyond the required courses found above. The sequence must be well integrated and consistent to ensure you gain knowledge in an area other than mathematics. When selecting electives, you should consult with the adviser of the department that interests you. Concentration work is in addition to the courses you take under other categories of the programs. For instance, required courses in physics do not count toward a concentration in physics.

Advanced Placement credits may be applied towards the first year of calculus. Students receiving grades of 4 or 5 in Calculus BC on advanced placement examinations in calculus conducted by the College Entrance Examination Board may be granted a maximum of 8 credits to be applied toward the 127-credit requirement for Bachelor's Degree in mathematics.

Typical Course of Study for the Bachelor of Science in Mathematics

Freshman Year

Fall Semester: 14 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits¹
- [MA-UY 1002 The Art of Mathematics](#) 2 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits

Spring Semester: 15 Credits

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits

Sophomore Year

Fall Semester: 16 Credits

- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [MA-UY 2314 Discrete Mathematics](#) 4 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- Humanities Social Sciences Elective 4 Credits

Spring Semester: 15 Credits

- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- Free Elective 3 Credits ²
- Humanities Social Sciences Elective 4 Credits

Junior Year

Fall Semester: 17 Credits

- [MA-UY 2224 Data Analysis](#) 4 Credits
- Free Elective 3 Credits ²
- Minor Specialty 3 Credits
- Humanities Social Sciences Elective 4 Credits
- Minor Specialty 3 Credits

Spring Semester: 17 Credits

- [MA-UY 3113 Advanced Linear Algebra and Complex Variables](#) 3 Credits
- [MA-UY 3914 Project in Mathematics I](#) 4 Credits ³
- Minor Specialty 3 Credits
- Humanities and Social Sciences Elective 4 Credits
- Free Elective 3 Credits ²

Senior Year

Fall Semester: 17 Credits

- [MA-UY 4613 Analysis I](#) 3 Credits
- [MA-UY 4413 Applied Partial Differential Equations](#) 3 Credits ³
- [MA-UY 3022 Probability Theory II](#) 2 Credits
- Free Elective 3 Credits ²
- Minor Specialty 3 Credits
- Minor Specialty 3 Credits

Spring Semester: 16 Credits

- [MA-UY 4623 Analysis II](#) 3 Credits
- [MA-UY 4423 Introductory Numerical Analysis](#) 3 Credits ³
- Free Elective 3 Credits ²

- Humanities and Social Sciences Elective *4 Credits*
- Minor Specialty *3 Credits*

Total credits required for the degree: 127 Credits

Footnotes

¹ Students placed by examination or by an adviser into [MA-UY 902](#), [MA-UY 912](#) or [MA-UY 914](#) must defer registration for [MA-UY 1024](#).

² The Free Elective can be a course offered by any department, provided it does not duplicate material studied in other courses. Students must meet the prerequisites for the courses.

³ May be substituted by another course with adviser's approval.

Mechanical Engineering, Aerospace Minor, B.S.

Typical Course of Study for the Bachelor of Science in Mechanical Engineering with Minor in Aerospace Engineering

Freshman Year

Fall Semester: 16 Credits

- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits
- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits

Spring Semester: 16 Credits

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [ME-UY 1012 Introduction to Mechanical Engineering](#) 2 Credits
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits

Sophomore Year

Fall Semester: 18 Credits

- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [ME-UY 2811 Materials Science Laboratory](#) 1 Credits
- [ME-UY 2813 Introduction to Materials Science](#) 3 Credits
- [ME-UY 2112 Computer Aided Design](#) 2 Credits
- Humanities and Social Sciences Elective 4 Credits ¹

Spring Semester: 16 Credits

- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [MA-UY 2224 Data Analysis](#) 4 Credits
- [ME-UY 2211 Statics Laboratory](#) 1 Credits
- [ME-UY 2213 Statics](#) 3 Credits

- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits

Junior Year

Fall Semester: 18 Credits

- [ME-UY 3333 Thermodynamics](#) 3 Credits
- [ME-UY 3211 Mechanics of Materials Laboratory](#) 1 Credits
- [ME-UY 3213 Mechanics of Materials](#) 3 Credits
- [ME-UY 3511 Measurement Systems Laboratory](#) 1 Credits
- [ME-UY 3513 Measurement Systems](#) 3 Credits
- [ME-UY 3223 Dynamics](#) 3 Credits
- Humanities and Social Sciences Elective 4 Credits¹

Spring Semester: 15 Credits

- [ME-UY 3233 Machine Design](#) 3 Credits
- [ME-UY 3311 Fluid Mechanics Laboratory](#) 1 Credits
- [ME-UY 3313 Fluid Mechanics](#) 3 Credits
- [ME-UY 3411 Automatic Control Laboratory](#) 1 Credits
- [ME-UY 3413 Automatic Control](#) 3 Credits
- Humanities and Social Sciences Elective 4 Credits¹

Senior Year

Fall Semester: 16 Credits

- [ME-UY 4112 Senior Design I](#) 2 Credits
- [ME-UY 4214 Finite Element Modeling, Design and Analysis](#) 4 Credits
- [ME-UY 4311 Heat Transfer Laboratory](#) 1 Credits
- [ME-UY 4313 Heat Transfer](#) 3 Credits
- [AE-UY 4603 Compressible Flow](#) 3 Credits
- [AE-UY 4653 Aircraft Flight Mechanics](#) 3 Credits

Spring Semester: 16 Credits

- [ME-UY 4113 Senior Design II](#) 3 Credits
- [AE-UY 4613 Aerodynamics](#) 3 Credits
- [AE-UY 4633 Aerospace Propulsion](#) 3 Credits
- Free Elective 3 Credits²
- Humanities and Social Sciences Elective 4 Credits¹

Total credits required for the degree: 131 Credits

Footnotes

¹ Students must take sixteen credits (four courses) of elective courses in the humanities and social sciences. Consult the

[Department of Technology, Culture and Society](#) portion of the bulletin for details. At least one humanities and social sciences elective must be a 3xxx/4xxx level course. At least one humanities and social sciences elective must be a writing-intensive course, labeled by “W.”

² A free elective is any course in any department of the University for which the student has the prerequisites.

Mechanical Engineering, B.S.

Typical Course of Study for the Bachelor of Science in Mechanical Engineering

Freshman Year

Fall Semester: 16 Credits

- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits
- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits

Spring Semester: 16 Credits

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [ME-UY 1012 Introduction to Mechanical Engineering](#) 2 Credits
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits

Sophomore Year

Fall Semester: 18 Credits

- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [ME-UY 2811 Materials Science Laboratory](#) 1 Credits
- [ME-UY 2813 Introduction to Materials Science](#) 3 Credits
- [ME-UY 2112 Computer Aided Design](#) 2 Credits
- Humanities and Social Sciences Elective 4 Credits ¹

Spring Semester: 16 Credits

- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [MA-UY 2224 Data Analysis](#) 4 Credits
- [ME-UY 2211 Statics Laboratory](#) 1 Credits
- [ME-UY 2213 Statics](#) 3 Credits

- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits

Junior Year

Fall Semester: 18 Credits

- [ME-UY 3333 Thermodynamics](#) 3 Credits
- [ME-UY 3211 Mechanics of Materials Laboratory](#) 1 Credits
- [ME-UY 3213 Mechanics of Materials](#) 3 Credits
- [ME-UY 3511 Measurement Systems Laboratory](#) 1 Credits
- [ME-UY 3513 Measurement Systems](#) 3 Credits
- [ME-UY 3223 Dynamics](#) 3 Credits
- Humanities and Social Sciences Elective 4 Credits¹

Spring Semester: 14 Credits

- [ME-UY 3233 Machine Design](#) 3 Credits
- [ME-UY 3311 Fluid Mechanics Laboratory](#) 1 Credits
- [ME-UY 3313 Fluid Mechanics](#) 3 Credits
- [ME-UY 3411 Automatic Control Laboratory](#) 1 Credits
- [ME-UY 3413 Automatic Control](#) 3 Credits
- ME Elective 3 Credits²

Senior Year

Fall Semester: 17 Credits

- [ME-UY 4112 Senior Design I](#) 2 Credits
- [ME-UY 4214 Finite Element Modeling, Design and Analysis](#) 4 Credits
- [ME-UY 4311 Heat Transfer Laboratory](#) 1 Credits
- [ME-UY 4313 Heat Transfer](#) 3 Credits
- ME Elective 3 Credits²
- Humanities and Social Sciences Elective 4 Credits¹

Spring Semester: 16 Credits

- [ME-UY 4113 Senior Design II](#) 3 Credits
- ME Elective 3 Credits²
- Free Elective 3 Credits³
- Free Elective 3 Credits³
- Humanities and Social Sciences Elective 4 Credits¹

Total credits required for the degree: 131 Credits

Footnotes

¹ Students must take sixteen credits (four courses) of elective courses in the humanities and social sciences. Consult the

[Department of Technology, Culture and Society](#) portion of the bulletin for details. At least one humanities and social sciences elective must be a 3xxx/4xxx level course. At least one humanities and social sciences elective must be a writing-intensive course, labeled by “W.”

² ME electives begin with the prefix AE-UY and ME-UY.

³ A free elective is any course in any department of the University for which the student has the prerequisites.

Physics and Mathematics, B.S.

Dual Major in Physics and Mathematics

Students must complete 128 credits, as defined below, to graduate from the NYU Tandon School of Engineering with a Bachelor of Science in Physics and Mathematics. Please note that the curriculum that follows applies to students who begin classes in the Fall of 2014 or later. For students who enter the NYU Tandon School of Engineering prior to that date, please review the curriculum and typical course schedule for students entering prior to Fall 2014.

Physics Requirements: 33 Credits

- [PH-UY 1013 Mechanics](#) 3 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- [PH-UY 2104 Analytical Mechanics](#) 4 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [PH-UY 2344 Introduction to Modern and Solid State Physics](#) 4 Credits
- [PH-UY 3002 Junior Physics Laboratory](#) 2 Credits
- [PH-UY 3234 Electricity and Magnetism](#) 4 Credits
- [PH-UY 4124 Thermodynamics and Statistical Physics](#) 4 Credits
- [PH-UY 4364 Introduction to the Quantum Theory](#) 4 Credits

Math Requirements: 29 Credits

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits
- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits
- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [MA-UY 2224 Data Analysis](#) 4 Credits
- [MA-UY 3113 Advanced Linear Algebra and Complex Variables](#) 3 Credits
- [MA-UY 4413 Applied Partial Differential Equations](#) 3 Credits
- [MA-UY 4423 Introductory Numerical Analysis](#) 3 Credits

Physics Electives: 7 Credits

Students should select 7 credits from the following list of Applied Physics elective courses. Guided studies and graduate courses may be substituted with adviser's approval.

- [PH-UY 2813 Astronomy and Astrophysics](#) 3 Credits
- [PH-UY 2823 Introduction to Geophysics](#) 3 Credits
- [PH-UY 3054 Introduction to Polymer Physics](#) 4 Credits
- [PH-UY 3103 Fundamentals of Applied Nuclear Physics](#) 3 Credits

- [PH-UY 3474 Introduction to Modern Optics](#) 4 Credits
- [PH-UY 3503 Introduction to Radiation Physics and Dosimetry](#) 3 Credits
- [PH-UY 3513 Nuclear and Radiation Instrumentation and Methods](#) 3 Credits
- [PH-UY 3603 Mathematical Physics](#) 3 Credits
- [PH-UY 3614 Computational Physics](#) 4 Credits
- [PH-UY 3703 Mathematical Physics II](#) 3 Credits
- [PH-UY 4554 Solid State Physics](#) 4 Credits
- [PH-UY 4603 Special Topics in Physics](#) 3 Credits

Math Electives: 10 Credits

Students should select 10 credits from the following list of Math elective courses. Guided studies and graduate courses may be substituted with adviser's approval.

- [MA-UY 3103 Problem Solving and Proofs](#) 3 Credits
- [MA-UY 3203 Linear Optimization](#) 3 Credits
- [MA-UY 3303 Differential Geometry](#) 3 Credits
- [MA-UY 4013 Introduction to Number Theory](#) 3 Credits
- [MA-UY 4023 Elements of Abstract Algebra](#) 3 Credits
- [MA-UY 4613 Analysis I](#) 3 Credits
- [MA-UY 4623 Analysis II](#) 3 Credits

Free Electives, Independent Study and Projects: 14 Credits

14 credits are reserved for free electives and independent study courses, of which 8 credits are reserved for a 6 credit applied physics project plus a 2 credit senior physics seminar or a 4-credit math project/thesis and an extra 4 credit math elective.

Electives in the Humanities and Social Sciences: 16 Credits

Students are required to take 16 credits in the humanities and social sciences requiring [EXPOS-UA 1](#) and [EXPOS-UA 2](#) as prerequisites. To gain some breadth and depth of knowledge, it is required that you take courses in at least two disciplines and at least one course at an advanced level.

Other Required Courses: 19 Credits

- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [PH-UY 1002 Physics: The Genesis of Technology](#) 2 Credits
- or
- [MA-UY 1002 The Art of Mathematics](#) 2 Credits

Science and Technology Studies, B.S.

Bachelor of Science Degree Requirements

STS majors take 120 credits, divided into four parts:

1. General Education Requirement: 40 Credits

(a) Texts, Communication and Social Thought Requirement: 2 courses, 8 Credits

- i. [EXPOS-UA 1](#) and [EXPOS-UA 2](#) - Writing the Essay and the Advanced College Essay

(b) Free Electives Requirement: 32 Credits

2. Technology/Science Requirement: 40 Credits

The minimum cumulative GPA for this requirement must be 3.0.

(a) Innovation and Problem Solving Requirement: 5 Credits

- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits or equivalent

(b) Technology/Science Electives: 35 Credits

35 Technology/Science credits taken from any of the following general fields, at least 15 credits of which must be from the same field (unless otherwise indicated by minor requirements specific to a given department and/or approved by the adviser).

- Biological Sciences
- Chemistry
- Computer Science
- Engineering
- Mathematics
- Applied Physics

3. STS Requirement: 40 Credits

Each class must be passed with a minimum grade of C.

(a) Core: 12 Credits

- [STS-UY 1002 Introduction to Science and Technology Studies](#) 2 Credits
- [STS-UY 2004 Science, Technology, and Society](#) 4 Credits
- [STS-UY 3004/W Seminar in Science and Technology Studies](#) 4 Credits
- [STS-UY 4002 Capstone Project in Science and Technology Studies](#) 2 Credits

(b) Restricted Electives: 28 Credits

7 courses from the Science, Technology, and Society (STS) cluster of Humanities and Social Sciences courses (excluding those taken to fulfill the Core Requirement 3a). These courses include STS-prefixed courses as well as those listed under the STS Cluster in the [Humanities and Social Sciences Electives List](#).

Typical Course of Study for STS Major, Tech/Sci Concentration Undefined

First Year

Fall Semester: 17 Credits

- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- Tech/Sci Elective 1 4 Credits
- Free Elective 1 4 Credits
- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits

Spring Semester: 14 Credits

- [STS-UY 1002 Introduction to Science and Technology Studies](#) 2 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- Free Elective 2 4 Credits
- Tech/Sci Elective 2 4 Credits

Sophomore Year

Fall Semester: 16 Credits

- [STS-UY 2004 Science, Technology, and Society](#) 4 Credits
- Tech/Sci Elective 3 4 Credits
- Tech/Sci Elective 4 4 Credits

- Free Elective 3 *4 Credits*

Spring Semester: 16 Credits

- STS Elective 1 *4 Credits*
- STS Elective 2 *4 Credits*
- Tech/Sci Elective 5 *4 Credits*
- Free Elective 4 *4 Credits*

Junior Year

Fall Semester: 16 Credits

- [STS-UY 3004/W Seminar in Science and Technology Studies](#) *4 Credits*
- STS Elective 3 *4 Credits*
- Tech/Sci Elective 6 *4 Credits*
- Tech/Sci Elective 7 *4 Credits*

Spring Semester: 12 Credits

- Free Elective 5 *4 Credits*
- Free Elective 6 *4 Credits*
- Free Elective 7 *4 Credits*

Senior Year

Fall Semester: 15 Credits

- STS Elective 4 *4 Credits*
- STS Elective 5 *4 Credits*
- STS Elective 6 *4 Credits*
- Tech/Sci Elective 8 *3 Credits*

Spring Semester: 14 Credits

- [STS-UY 4002 Capstone Project in Science and Technology Studies](#) *2 Credits*
- STS Elective 7 *4 Credits*
- Tech/Sci Elective 9 *4 Credits*
- Free Elective 8 *4 Credits*

Total credits required for the degree: 120

Science and Technology, B.S. Options

Concentrations

- [Science and Technology Studies, BMS Concentration, B.S.](#)
- [Science and Technology Studies, Civil Engineering Concentration, B.S.](#)
- [Science and Technology Studies, Electrical Engineering Concentration, B.S.](#)

Minors

- [Science and Technology Studies, Applied Physics Minor, B.S.](#)
- [Science and Technology Studies, Computer Science Minor, B.S.](#)

Double Major

- [Science and Technology Double Major](#)

Sustainable Urban Environments, B.S.

Bachelor of Science Degree Requirements

SUE majors take 132 credits, divided into three parts:

General Education Requirement

Texts, Communication and Social Thought Requirement: 32 Credits

- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
and
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- Six Humanities and Social Sciences courses, including at least one course of Level 3 and one Writing Intensive course

General Education Requirement: 20 Credits

- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits
- General Technical Elective 4 Credits
- General Math Elective 4 Credits
- General Science Elective 1 4 Credits
- General Science Elective 2 4 Credits

Sustainable Urban Environments Requirements

A. Core: 24 Credits

- [CE-UY 1002 Introduction to Civil Engineering](#) 2 Credits
- [CE-UY 4043 Sustainable Cities](#) 3 Credits
- [URB-UY 2054/W Introduction to Urban Policy](#) 4 Credits
- [HI-UY 3034/W History of New York's Urban Infrastructure](#) 4 Credits
- [URB-UY 2024/W Design of Cities](#) 4 Credits
- [URB-UY 2044 Methods for Studying Urban Environments](#) 4 Credits

And one of the following Civil Engineering courses:

- [CE-UY 3303 Traffic Engineering](#) 3 Credits
- [CE-UY 3313 Introduction to Transportation Systems](#) 3 Credits
- [CE-UY 4033 Introduction to Urban Infrastructure Systems Management](#) 3 Credits

B. Track/SUE Electives: 5 Courses, 20 Credits

Students take at least one course each from the history group, social sciences group, and environment group:

History Group

- [CE-UY 3353 History of the New York City Transit System](#) 3 Credits
- or
- [HI-UY 2353 A History of NYC Transit and the Development of NYC](#) 3 Credits
- [HI-UY 2514/W Introduction to New York City History](#) 4 Credits
- [HI-UY 2724 Urban Environmental History](#) 4 Credits
- [HI-UY 4334W Seminar in Urban Infrastructure History](#) 4 Credits

Social Sciences Group

- [PS-UY 2324W Environmental Psychology](#) 4 Credits
- [PS-UY 2724 Human Factors in Engineering Design](#) 4 Credits
- [PS-UY 3724 Psychology of Sustainability](#) 4 Credits
- [PS-UY 3754 Psychology of Living in Extreme Environments](#) 4 Credits
- [URB-UY 2034 Humans in the Urban Environment](#) 4 Credits
- [URB-UY 3354 Urban Impact Assessment](#) 4 Credits

Environmental Group

- [SEG-UY 2184/W Beyond Oil: Fueling Tomorrow's Vehicles](#) 4 Credits
- [SEG-UY 2194/W Writing About Nature and the Environment](#) 4 Credits
- [URB-UY 2064 Introduction to Urban Planning](#) 4 Credits
- [URB-UY 2114 Geographic Information Systems](#) 4 Credits
- [URB-UY 2224 Natural Environment of New York City](#) 4 Credits
- [URB-UY 2234 Natural Environmental Catastrophes and Cities](#) 4 Credits
- [URB-UY 2334 Introduction to Environmental Sciences](#) 4 Credits
- [URB-UY 3034 Evidence-Based Design](#) 4 Credits
- [URB-UY 3214 Cities in Developing Countries](#) 4 Credits
- [URB-UY 3234 Planning for Healthy Cities](#) 4 Credits
- [URB-UY 3314 History and Design of Urban Parks](#) 4 Credits
- [URB-UY 3834 Special Topics in Sustainable Urban Environments](#) 4 Credits

C. Project Courses: 8 Credits

- [URB-UY 3014 Directed Study in SUE](#) 4 Credits
- [URB-UY 4024 Capstone Project](#) 4 Credits
- [URB-UY 4034 Internship](#) 4 Credits

Electives Requirement

A. Technical Electives: 12 Credits

The technical electives requirement can be fulfilled by any course that advances the student's knowledge of, or skills in applied science, engineering, or computer science.

B. Free Electives: 16 Credits

Students may take courses from any department.

Typical Course of Study for the Bachelor of Science in Sustainable Urban Environments

Note: A typical SUE semester is split between two technology/science courses and two humanities/social sciences courses. The flexibility of a SUE major allows many variations, some with heavier technology/science concentrations than others. Each SUE student customizes his or her curriculum in consultation with the program's academic adviser. What follows is one way to fulfill the degree requirements, and this particular plan concentrates electives in the second semester of the third year so that a student can study abroad in one of New York University's global university campuses.

First Year

Fall Semester: 16 Credits

- [EXPOS-UA 1 Writing the Essay](#) 4 Credits
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- General Science Elective 1 4 Credits
- General Technical Elective 4 Credits

Spring Semester: 18 Credits

- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- General Science Elective 2 4 Credits
- [CE-UY 1002 Introduction to Civil Engineering](#) 2 Credits
- [URB-UY 2054/W Introduction to Urban Policy](#) 4 Credits
- Humanities and Social Sciences Elective 1 4 Credits

Second Year

Fall Semester: 18 Credits

- [CE-UY 4033 Introduction to Urban Infrastructure Systems Management](#) 3 Credits
- SUE Track Course 1 4 Credits
- Free Elective 1 4 Credits
- [CE-UY 4043 Sustainable Cities](#) 3 Credits
- [HI-UY 3034/W History of New York's Urban Infrastructure](#) 4 Credits

Spring Semester: 16 Credits

- General Math Elective 4 Credits
- SUE Technical Elective 4 Credits
- [URB-UY 2024/W Design of Cities](#) 4 Credits
- [URB-UY 2044 Methods for Studying Urban Environments](#) 4 Credits

Third Year

Fall Semester: 16 Credits

- SUE Technical Elective 2 4 Credits
- SUE Technical Elective 3 4 Credits
- SUE Track Course 2 4 Credits
- [URB-UY 4034 Internship](#) 4 Credits

Spring Semester: 16 Credits

- Free Elective 2 4 Credits
- Free Elective 3 4 Credits
- Humanities and Social Sciences Elective 2 4 Credits
- Humanities and Social Sciences Elective 3 4 Credits

Fourth Year

Fall Semester: 16 Credits

- SUE Track Course 3 4 Credits
- SUE Track Course 4 4 Credits
- Humanities and Social Sciences Elective 4 4 Credits
- Humanities and Social Sciences Elective 5 4 Credits

Spring Semester: 16 Credits

- [URB-UY 4024 Capstone Project](#) 4 Credits
- SUE Track Course 5 4 Credits
- Free Elective 4 4 Credits
- Humanities & Social Science Elective 6 4 Credits

Total credits required for the degree: 132

Graduate Certificate Programs

Bioinformatics (Online) Advanced Certificate	297
Construction Management Advanced Certificate.....	298
Executive Construction Management (Exec 21) Advanced Certificate	299
Project Management (Online) Advanced Certificate.....	300
Traffic Engineering Advanced Certificate	301
Transportation Management Advanced Certificate.....	302
Transportation Planning Advanced Certificate.....	303

Bioinformatics (Online) Advanced Certificate

Emerging from unprecedented investigations into biological phenomena over the last decades, the in-demand field of bioinformatics organizes and translates vast streams of data from living organisms generated by the Human Genome Project and other more recent studies. If you are seeking a role as an expert in bioinformatics, you need a thorough appreciation of biology, chemistry, and computer science. This online graduate certificate prepares you to join a talented cadre of creative specialists in the fast-paced pharmaceutical and biotechnology industries.

This program is also offered [offline](#).

Curriculum

4 Required Courses (12 Credits)

Required Core Courses (9 Credits)

- [BI-GY 7533 Bioinformatics I: Sequence Analysis](#) 3 Credits
- [BI-GY 7643 Computational Tools: Perl & Bioperl](#) 3 Credits
- [BI-GY 7653 Next Generation Sequence Analysis](#) 3 Credits

Elective Courses (3 Credits)

Please choose 1 elective.

- [BI-GY 7543 Bioinformatics II: Protein Structure](#) 3 Credits
- [BI-GY 7633 Microarray Analysis](#) 3 Credits
- [CS-GY 6083 Principles of Database Systems](#) 3 Credits

Construction Management Advanced Certificate

Curriculum

Students must complete at least five courses (15 credits) in accordance with the following requirements:

- i. Select at least three courses (9 credits) from those courses that satisfy the [Major Requirement](#) for the Master of Science in Construction Management Program and are approved by a Construction Management Program Director; and
- ii. Select at least one (3 credits) graduate-level Management (MG) course approved by a Construction Management Program Director.

Grade Requirements

Students must achieve a B (3.0) cumulative average in all graduate courses taken at NYU Polytechnic School of Engineering.

Executive Construction Management (Exec 21) Advanced Certificate

Curriculum

Students must complete 15 credits of course work to earn a certificate. A minimum of 9 credits must be selected from the Exec 21 Core Courses, and up to 6 credits may be selected from those courses that satisfy the [Major Requirement](#) for the Master of Science in Construction Management Program and are approved by a Construction Management Program Director.

Exec 21 Core Courses:

- [CE-GY 8703 Managing and Leading in the 21st Century](#) 3 Credits
- [CE-GY 8713 Construction and the Law](#) 3 Credits
- [CE-GY 8723 How to Succeed in Construction](#) 3 Credits
- [CE-GY 8733 Infrastructure Financing: Structuring of a Deal](#) 3 Credits
- [CE-GY 875X Employer Focused Residency](#) Up to 3 credits Credits
- [CE-GY 8763 Capital Program Management/Program Development](#) 3 Credits
- [CE-GY 8773 Dispute Avoidance and Resolution](#) 3 Credits
- [CE-GY 8783 Construction Management and Planning](#) 3 Credits
- [CE-GY 8803 Infrastructure Planning for Public Works](#) 3 Credits

Grade Requirements

Students must maintain a B (3.0) cumulative average in all graduate courses taken at NYU Polytechnic School of Engineering.

Project Management (Online) Advanced Certificate

This certificate is also offered offline.

Total: 15 Credits

Required: 6 Credits

- [MG-GY 6303 Operations Management](#) 3 Credits
- [MG-GY 8203 Project Management](#) 3 Credits

Electives: 9 Credits

Select any three 3-credit MG courses to complete your particular advanced interest.

Note:

Other MG courses may be substituted only with the pre-approval of the MSM Program Director. All Advanced Certificates from the Department of Technology Management and Innovation require 15 credits of courses with the prefix “MG”, except for the Advanced Certificate in Construction Management presented in this Bulletin under Civil Engineering’s Construction Management Program.

Traffic Engineering Advanced Certificate

Advanced Certificate in Traffic Engineering

Curriculum

Students must complete 12 credits of course work to earn an advanced certificate. Seven and a half credits are required courses, One 1.5-credit course plus one three-credit course are chosen from the lists below.

Required Courses

- [TR-GY 6011 Fundamental Concepts in Transportation](#) 1.5 Credits
- [TR-GY 6211 Economic Analysis of Transportation Alternatives](#) 1.5 Credits
- [TR-GY 6333 Transportation and Traffic Concepts, Characteristics, and Studies](#) 3Credits
- [TR-GY 6343 Traffic Operations & Control](#) 3 Credits

Select One of the Following:

- [TR-GY 6223 Intelligent Transportation Systems and Their Applications](#) 3 Credits
- [TR-GY 7033 Multimodal Transportation Safety](#) 3 Credits
- [TR-GY 7323 Design of Parking and Terminal Facilities](#) 3 Credits

Grade Requirements

Students must maintain a B (3.0) cumulative average in all graduate courses taken at NYU Polytechnic School of Engineering.

Transportation Management Advanced Certificate

Advanced Certificate in Transportation Management

Curriculum

Students must complete 12 credits of course work to earn an advanced certificate. Nine credits are required courses, plus three credits are chosen from the list of elective courses.

Required Courses

- [TR-GY 6011 Fundamental Concepts in Transportation](#) 1.5 Credits
 - [TR-GY 6211 Economic Analysis of Transportation Alternatives](#) 1.5 Credits
 - [TR-GY 7133 Urban Public Transportation Systems](#) 3 Credits
 - [TR-GY 7223 Management of Transit Maintenance and Operations](#) 3 Credits
- and select either
- [TR-GY 7213 Transportation Management](#) 3 Credits
 - or
 - [TR-GY 6223 Intelligent Transportation Systems and Their Applications](#) 3 Credits

Grade Requirements

Students must maintain a B (3.0) cumulative average in all graduate courses taken at NYU Polytechnic School of Engineering.

Transportation Planning Advanced Certificate

Advanced Certificate in Transportation Planning

Curriculum

Students must complete 12 credits of course work to earn an advanced certificate. Nine credits are required courses, plus three credits are chosen from the list of elective courses.

Required Courses

- [TR-GY 6011 Fundamental Concepts in Transportation](#) 1.5 Credits
- [TR-GY 6113 Forecasting Urban Travel Demand](#) 3 Credits
- [TR-GY 6231 Transportation Planning Principles and Practice](#) 1.5 Credits
- [TR-GY 6333 Transportation and Traffic Concepts, Characteristics, and Studies](#) 3 Credits

Select Three Credits from the Following:

- [TR-GY 7133 Urban Public Transportation Systems](#) 3 Credits
- [TR-GY 6223 Intelligent Transportation Systems and Their Applications](#) 3 Credits
- [TR-GY 7033 Multimodal Transportation Safety](#) 3 Credits

Grade Requirements

Students must maintain a B (3.0) cumulative average in all graduate courses taken at NYU Polytechnic School of Engineering.

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Applied Physics, M.S.

Master of Science in Applied Physics

The Master of Science in Applied Physics will be offered only on the Brooklyn Campus and the courses will be offered primarily in the evening. Admitted students will be expected to have a BS in physics, applied physics, or a closely-related discipline and to make up any deficiencies before commencing graduate studies. Letters of recommendation, GRE and TOEFL scores, and application letters will be considered in the admission process.

Degree Requirements

Completion of the Master of Science in Applied Physics requires a minimum of 30 semester credits. Students are required to take 6 credits of basic courses (a 3-credit course in quantum mechanics and two semesters of graduate seminar) with the balance of the necessary credits earned in elective physics courses. The elective courses may include a 6-credit research project or a 9-credit thesis in physics. Choice of a project or thesis option and of elective courses should be made with the approval of the graduate adviser. As many as 9 credits of physics courses taken elsewhere may be accepted towards the degree, with the approval of the graduate adviser. No comprehensive examination is required for the master's degree in applied physics.

Minimum Course Requirements

- [PH-GY 6673 Quantum Mechanics I](#) 3 Credits
- [PH-GY 9531 Graduate Seminar in Physics I](#) 1.5 Credits
- [PH-GY 9541 Graduate Seminar in Physics II](#) 1.5 Credits

Elective Courses: 24 Credits

Of elective courses, 4 will be allowed at the 5000 level.

- [PH-GY 5343 Physical Basis of Nanotechnology](#) 3 Credits
- [PH-GY 5443 Physical Techniques and Applications of Nanotechnology](#) 3 Credits
- [PH-GY 5473 Modern Optics](#) 3 Credits
- [PH-GY 5493 Physics of Nanoelectronics](#) 3 Credits
- [PH-GY 5553 Physics of Quantum Computing](#) 3 Credits
- [PH-GY 5663 Physics of Alternative Energy](#) 3 Credits
- [PH-GY 6403 Physical Concepts of Polymer Nanocomposites](#) 3 Credits
- [PH-GY 6513 Introduction to Solid-State Physics I](#) 3 Credits
- [PH-GY 6523 Introduction to Solid-State Physics II](#) 3 Credits
- [PH-GY 6553 Advanced Quantum Computing](#) 3 Credits

- [PH-GY 6683 Quantum Mechanics II](#) 3 Credits
- [PH-GY 8013 Selected Topics in Advanced Physics](#) 3 Credits
- [PH-GY 8023 Selected Topics in Advanced Physics](#) 3 Credits
- [PH-GY 955X Readings in Applied Physics](#) 1-4 Credits
- [PH-GY 997X MS Thesis in Applied Physics](#) 3 Credits
- [PH-GY 999X PhD Dissertation in Applied Physics](#) 3 Credits

Total Credits: 30

Bioinformatics (Online), M.S.

Emerging from unprecedented investigations into biological phenomena over the past decades, the in-demand field of bioinformatics organizes and translates vast streams of data from living organisms generated by the Human Genome Project and other more recent studies. Students seeking a role as an expert in bioinformatics will need to thoroughly appreciate biology, chemistry, computer science, and statistics. This online Master of Science in Bioinformatics prepares students to join a talented cadre of creative specialists in the fast-paced pharmaceutical, biotechnology, alternative energy, and agriculture industries.

Basic Core Courses: 6 Credits

- BI-GY 7513 Chemical Foundation for Bioinformatics 3 Credits
- BI-GY 7523 Biological Foundation for Bioinformatics 3 Credits

Required Core Courses— 3 Course Sequence: 9 Credits

- BI-GY 7533 Bioinformatics I: Sequence Analysis 3 Credits
- BI-GY 7543 Bioinformatics II: Protein Structure 3 Credits
- BI-GY 7553 Bioinformatics III: Functional Prediction 3 Credits

Required Electives: 9 Credits

- BI-GY 7613 Introduction to Systems Biology 3 Credits
- BI-GY 7623 Systems Biology: -Omics and –Omics 3 Credits
- BI-GY 7843 Molecular Modeling and Simulation 3 Credits

Other Electives: 9 Credits

- CS-GY 5303 Introduction to Programming and Problem Solving 3 Credits
- CS-GY 5403 Data Structures and Algorithms 3 Credits
- BI-GY 7573 Special Topics in Informatics in Chemical and Biological Sciences Credits
- BI-GY 7583 Guided Studies in Bioinformatics I 3 Credits
- BI-GY 997X MS Thesis in Bioinformatics Credits
- CM-GY 8103 Liquid Chromatography 3 Credits

Minimum Total: 30 Credits

Bioinformatics, M.S.

Requirements for the Master of Science

The Master of Science degree is generally intended for students from life science, computer science, computer engineering, math and statistics backgrounds seeking in-depth knowledge in informatics applications for genomics and proteomics. Admission to the master's program requires a bachelor's degree from an accredited institution, with superior undergraduate academic record and completion of all prerequisite courses. Students who do not meet all requirements will be considered individually for admission and may be admitted subject to the completion of appropriate undergraduate courses to remove preparation deficiencies. Applicants who are otherwise sufficiently prepared for admission without undergraduate deficiencies may be required to take specified undergraduate and introductory-level graduate courses. Such courses count towards the master's degree.

To satisfy the requirements for the Master of Science degree, the student must complete 30 credits. The Institute requires an overall grade-point average of B in all graduate courses. Students are required to take the four core courses. The students who do not have a BS degree in Chemical or Biological Sciences are required to take Chemical and Biological Foundations for Bioinformatics courses [BI-GY 7513 and BI-GY 7523]. Computational proficiency is expected.

Students may elect research and a thesis (9 credits). An oral thesis defense is held after the typed, written thesis is submitted in accordance with university formats for projects, theses and publications. A grade of A or B is required. Students who elect not to write a thesis may choose to take 3 to 6 credits of guided studies and submit a written report. Students can satisfy remaining credit requirements by taking elective courses with their advisor's approval. No more than 9 credits of electives can be selected from outside the program.

Basic Core Courses

Required courses for students with computer science or similar background:

- BI-GY 7513 Chemical Foundation for Bioinformatics 3 Credits
- BI-GY 7523 Biological Foundation for Bioinformatics 3 Credits

Required courses for students with chemical or biological science background:

- CS-GY 5303 Introduction to Programming and Problem Solving 3 Credits
- CS-GY 5403 Data Structures and Algorithms 3 Credits

Required Core Courses

- BI-GY 7533 Bioinformatics I: Sequence Analysis 3 Credits
- BI-GY 7543 Bioinformatics II: Protein Structure 3 Credits
- BI-GY 7553 Bioinformatics III: Functional Prediction 3 Credits
- BI-GY 7643 Computational Tools: Perl & Bioperl 3 Credits

Electives

- BI-GY 7613 Introduction to Systems Biology 3 Credits
- BI-GY 7623 Systems Biology: -Omics and –Omics 3 Credits
- BI-GY 7633 Microarray Analysis 3 Credits
- BI-GY 7843 Molecular Modeling and Simulation 3 Credits
- BI-GY 7573 Special Topics in Informatics in Chemical and Biological Sciences Credits
- BI-GY 7583 Guided Studies in Bioinformatics I 3 Credits
and/or
- BI-GY 7593 Guided Studies in Bioinformatics II 3 Credits
- CS-GY 6003 Foundations of Computer Science 3 Credits
- CS-GY 6083 Principles of Database Systems 3 Credits
- CS-GY 6923 Machine Learning 3 Credits

Biomedical Engineering, Bioinstrumentation Track, M.S.

The Curriculum

Requirements for the Master of Science

Each track within the BME MS program includes two options. The first specifies course requirements that include a thesis option and a second that specifies courses only. Students who choose the master's thesis option must register for at least 3 credits of BE-GY 997x and then write and defend a master's thesis according to School guidelines. Those students electing the thesis option will also be required to take CM-GY 5040: Chemical Lab Safety.

Biomedical Engineering-Bioinstrumentation Track

To meet graduation requirements, students must achieve an overall B average in all courses (including MS thesis, research or guided studies) and must not have more than two grades of C in required (core) subjects.

Listed below are required (core) courses for students in the **Bioinstrumentation** track that fulfill the requirements for an MS in Biomedical Engineering. The core courses for students electing the thesis option are presented below. Students opting for the course only MS degree will select additional courses from the electives list to bring their total up to 30 credits as required by the MS degree.

Required Courses:

- BE-GY 6103 Anatomy, Physiology and Biophysics I 3 Credits
- BE-GY 6113 Anatomy, Physiology and Biophysics II 3 Credits
- BE-GY 6303 Bio-optics 3 Credits
- EL-GY 6303 Probability and Stochastic Processes 3 Credits
- BE-GY 6503 Biomedical Instrumentation 3 Credits
- CBE-GY 6153 Applied Mathematics in Engineering 3 Credits
- EL-GY 6113 Digital Signal Processing I 3 Credits
- BE-GY 9740 Seminar in Biomedical Engineering 0 Credits
- BE-GY 9730 Colloquium in Biomedical Engineering 0 Credits

Electives

- See List below 3-9 Credits *

Research

- BE-GY 997x MS Thesis in Biomedical Engineering *9 total, each 3 Credits*

Total Credits: 30

In addition

Once per year, biomedical engineering MS students must register for Colloquium in Biomedical Engineering (BE-GY 9730, 0 credits) and Seminar in Biomedical Engineering (BE-GY 9740, 0 credits).

For all students in the **Bioinstrumentation** track, the remaining 6 credits must be selected from the list of course electives, unless permission is granted by the biomedical engineering graduate adviser to substitute a course not listed below. Alternatively, students also may elect to take one or two biomedical engineering research courses (BE-GY 873x) without writing a thesis.

Electives

The list below contains the elective courses that are available to students pursuing an MS degree in the Bioinstrumentation track.

- BT-GY 6063 Molecular Immunology *3 Credits*
- EL-GY 5823 Biomedical Imaging I *3 Credits*
- EL-GY 6123 Image and Video Processing *3 Credits*
- BE-GY 6463 Statistics for Biomedical Engineers *3 Credits*
- BE-GY 6483 Digital Signal Processing Laboratory *3 Credits*
- BE-GY 6603 Drug Delivery *3 Credits*
- BE-GY 6803 Biomaterials: Engineering Principles and Design Consideration *3 Credits*
- BE-GY 6753 Orthopaedic Biomechanics and Biomaterials *3 Credits*
- BE-GY 871x Guided Studies in Biomedical Engineering *Credits*
- CM-GY 9433 Protein Engineering *3 Credits*
- BE-GY 9443 Tissue Engineering *3 Credits*
- BE-GY 9753 Bioethics Seminar *3 Credits*
- CS-GY 6643 Computer Vision and Scene Analysis *3 Credits*
- MA-GY 6283 Mathematical Modeling in Biology *3 Credits*
- ME-GY 7863 Special Topics *3 Credits*
- PH-GY 6403 Physical Concepts of Polymer Nanocomposites *3 Credits*
- BE-GY 6353 Special Topics in Biomedical Engineering *3 Credits*
- MATH-GA 2852.001 Advanced Topics in Math Biology *4 Credits*
- BMSC-GA 4404 Fundamental concepts of MRI *3 Credits*

- BMSC-GA 4409 Advanced MRI 3 *Credits*
- BMSC-GA 4426 Medical Imaging I 3 *Credits*
- BMSC-GA 4427 Practical MRI I 6 *Credits*
- BMSC-GA 4428 Practical MRI II 6 *Credits*
- BMSC-GA 4469 Positron Emission Tomography 3 *Credits*

Biomedical Engineering, Biomaterials Track, M.S.

The Curriculum

Requirements for the Master of Science

Each track within the BME MS program includes two options. The first specifies course requirements that include a thesis option and a second that specifies courses only. Students who choose the master's thesis option must register for at least 3 credits of BE-GY 997x and then write and defend a master's thesis according to School guidelines. Those students electing the thesis option will also be required to take CM-GY 5040: Chemical Lab Safety.

Biomedical Engineering-Biomaterials Track

To meet graduation requirements, students must have an overall B average in all courses (including MS thesis, research or guided studies) and must not have more than two grades of C in required (core) subjects.

Required courses for all students in the **Biomaterials** Track that fulfill their requirements for an MS in Biomedical Engineering are shown below:

Required Courses

- BT-GY 6063 Molecular Immunology *3 Credits*
- BE-GY 6103 Anatomy, Physiology and Biophysics I *3 Credits*
- BE-GY 6113 Anatomy, Physiology and Biophysics II *3 Credits*
- BE-GY 6463 Statistics for Biomedical Engineers *3 Credits*
- BE-GY 6803 Biomaterials: Engineering Principles and Design Consideration *3 Credits*
- BE-GY 6753 Orthopaedic Biomechanics and Biomaterials *3 Credits*
- CM-GY 9433 Protein Engineering *3 Credits*
- BE-GY 9443 Tissue Engineering *3 Credits*
- BE-GY 9740 Seminar in Biomedical Engineering *0 Credits*
- BE-GY 9730 Colloquium in Biomedical Engineering *0 Credits*

Electives

- See List below *6 Credits* *

Research

- BE-GY 997x MS Thesis in Biomedical Engineering *9 total, each 3 Credits*

Total Credits: 30

In addition

Once per year, biomedical engineering MS students must register for Colloquium in Biomedical Engineering (BE-GY 9730, 0 credits) and Seminar in Biomedical Engineering (BE-GY 9740, 0 credits).

For all students in the **Biomaterials** track, remaining credits (6) must be selected from the list of electives unless permission is granted by the biomedical engineering graduate adviser to substitute a course not listed below. Alternatively, students also may elect to take research in biomedical engineering courses (BE-GY 873x, 3 to 6 credits) without writing a thesis.

Electives

The list below contains the elective courses that are available to students pursuing an MS degree in the Biomaterials track.

- EL-GY 5823 Biomedical Imaging I *3 Credits*
- EL-GY 6123 Image and Video Processing *3 Credits*
- EL-GY 6113 Digital Signal Processing I *3 Credits*
- BE-GY 6483 Digital Signal Processing Laboratory *3 Credits*
- EL-GY 6303 Probability and Stochastic Processes *3 Credits*
- BE-GY 6603 Drug Delivery *3 Credits*
- BE-GY 871x Guided Studies in Biomedical Engineering *Credits*
- BE-GY 9753 Bioethics Seminar *3 Credits*
- CBE-GY 6153 Applied Mathematics in Engineering *3 Credits*
- CS-GY 6643 Computer Vision and Scene Analysis *3 Credits*
- MA-GY 6283 Mathematical Modeling in Biology *3 Credits*
- ME-GY 7863 Special Topics *3 Credits*
- PH-GY 6403 Physical Concepts of Polymer Nanocomposites *3 Credits*
- BE-GY 6353 Special Topics in Biomedical Engineering *3 Credits*
- MA-GA 2852.001 Advanced Topics in Math Biology *4 Credits*
- BMSC-GA 4404 Fundamental concepts of MRI *3 Credits*
- BMSC-GA 4409 Advanced MRI *3 Credits*
- BMSC-GA 4426 Medical Imaging I *3 Credits*
- BMSC-GA 4427 Practical MRI I *6 Credits*

- BMSC-GA 4428 Practical MRI II *6 Credits*
- BMSC-GA 4469 Positron Emission Tomography *3 Credits*

Biomedical Engineering, Medical Imaging Track, M.S.

The Curriculum

Requirements for the Master of Science

Each track within the BME MS program includes two options. The first specifies course requirements that include a thesis option and a second that specifies courses only. Students who choose the master's thesis option must register for at least 3 credits of BE-GY 997x and then write and defend a master's thesis according to School guidelines. Those students electing the thesis option will also be required to take CM-GY 5040: Chemical Lab Safety.

Biomedical Engineering—Medical Imaging Track

To meet graduation requirements, students must achieve an overall B average in all courses (including MS thesis, research or guided studies) and must not have more than two grades of C in required (core) subjects.

Listed below are required (core) courses for students in the **Medical Imaging** track that fulfill the requirements for an MS in Biomedical Engineering.

Required Courses:

- BE-GY 6103 Anatomy, Physiology and Biophysics I 3 Credits
- BE-GY 6113 Anatomy, Physiology and Biophysics II 3 Credits
- EL-GY 5823 Biomedical Imaging I 3 Credits
- **OR** BMSC-GA 4426 Medical Imaging 3 Credits
- EL-GY 6303 Probability and Stochastic Processes 3 Credits
- CBE-GY 6153 Applied Mathematics in Engineering 3 Credits
- EL-GY 6113 Digital Signal Processing I 3 Credits
- EL-GY 6123 Image and Video Processing 3 Credits
- BE-GY 9740 Seminar in Biomedical Engineering 0 Credits
- BE-GY 9730 Colloquium in Biomedical Engineering 0 Credits

Electives

- See List below 3-9 Credits *

Research

- BE-GY 997x MS Thesis in Biomedical Engineering *9 total, each 3 Credits*

Total Credits: 30

In addition

Once per year, biomedical engineering MS students must register for Colloquium in Biomedical Engineering (BE-GY 9730, 0 credits) and Seminar in Biomedical Engineering (BE-GY 9740, 0 credits).

For all students in the Medical Imaging track, the remaining 6 credits must be selected from the list of course electives, unless permission is granted by the biomedical engineering graduate adviser to substitute a course not listed below. Alternatively, students also may elect to take one or two biomedical engineering research courses (BE-GY 873x) without writing a thesis.

Electives

The list below contains the elective courses that are available to students pursuing an MS degree in the Medical Imaging track.

- BT-GY 6063 Molecular Immunology *3 Credits*
- BE-GY 6463 Statistics for Biomedical Engineers *3 Credits*
- BE-GY 6483 Digital Signal Processing Laboratory *3 Credits*
- BE-GY 6603 Drug Delivery *3 Credits*
- BE-GY 6803 Biomaterials: Engineering Principles and Design Consideration *3 Credits*
- BE-GY 6753 Orthopaedic Biomechanics and Biomaterials *3 Credits*
- BE-GY 871x Guided Studies in Biomedical Engineering *Credits*
- CM-GY 9433 Protein Engineering *3 Credits*
- BE-GY 9443 Tissue Engineering *3 Credits*
- BE-GY 9753 Bioethics Seminar *3 Credits*
- CS-GY 6643 Computer Vision and Scene Analysis *3 Credits*
- MA-GY 6283 Mathematical Modeling in Biology *3 Credits*
- ME-GY 7863 Special Topics *3 Credits*
- PH-GY 6403 Physical Concepts of Polymer Nanocomposites *3 Credits*
- BE-GY 6353 Special Topics in Biomedical Engineering *3 Credits*
- MA-GA 2852.001 Advanced Topics in Math Biology *4 Credits*
- BMSC-GA 4404 Fundamental concepts of MRI *3 Credits*
- BMSC-GA 4409 Advanced MRI *3 Credits*
- BMSC-GA 4426 Medical Imaging I *3 Credits*

- BMSC-GA 4427 Practical MRI I *6 Credits*
- BMSC-GA 4428 Practical MRI II *6 Credits*
- BMSC-GA 4469 Positron Emission Tomography *3 Credits*

Biotechnology and Entrepreneurship, M.S.

Requirements for the Masters of Science

Students entering this program should have an undergraduate degree in a science or engineering discipline and must have taken undergraduate courses in biochemistry and cell and molecular biology. The 30-credit curriculum of this program comprises three parts:

1. Four required courses offering a broad overview of cutting-edge areas of biotechnology: biocatalysis and biomaterials, biotechnology and health care, biosensors and biochips, biotechnology and the pharmaceuticals industry (12 credits).
2. One required and a wide choice of elective 1.5- and 3-credit courses on technology innovation, intellectual-property management, finances, marketing, business-plan preparation and fund-raising (12 credits).
3. Two more electives up to 6 credits or an optional project involving either technology-competition analysis and business-plan preparation or a placement in an early-stage start-up company (6 credits).

To meet graduation requirements, students must attain an overall GPA of 3.0 (average of a B) in all their courses and at least a B- in each of the required courses.

Required Courses: 15 Credits

The five required courses are listed below:

- BTE-GY 6013 Biotechnology and the Pharmaceutical Industry *3 Credits*
- BTE-GY 6023 Biotechnology and Health Care *3 Credits*
- BTE-GY 6033 Biosensors and Biochips *3 Credits*
- BTE-GY 6043 Biocatalysis in Industry *3 Credits*
- MG-GY 7703 Entrepreneurship *3 Credits*

Elective Courses: 6-15 Credits

Students must take courses from the list below, which will amount to at least 6 credits in total; e.g., two 3-credit or four 1.5-credit courses:

- BT-GY 6053 Introduction to Neuroscience for Biotechnologists *3 Credits*
- BT-GY 6063 Molecular Immunology *3 Credits*
- BT-GY 6093 Biomedical Materials & Devices for Human Body Repair *3 Credits*
- BT-GY 7013 Special Topics in Biotechnology *3 Credits*
- BT-GY 7033 Business Concepts for the Biotechnology Entrepreneur *3 Credits*
- BT-GY 9433 Protein Engineering *3 Credits*

- BT-GY 9443 Tissue Engineering 3 Credits
- CM-GY 8213 Bioanalytical Chemistry 3 Credits
- CM-GY 9423 Biochemistry II 3 Credits
- JW-GY 6003 Introduction to Technical Communication 3 Credits
- MG-GY 6093 Accounting and Finance 3 Credits
- MG-GY 7871 Intellectual Property for Technology and Information Managers 1.5Credits
or
- MG-GY 7873 Managing Intellectual Property and Intellectual Capital 3 Credits
- MG-GY 8203 Project Management 3 Credits
- MG-GY 8653 Managing Technological Change and Innovation 3 Credits
- MG-GY 8711 Introduction to Entrepreneurial Finance 1.5 Credits
or
- MG-GY 8713 Entrepreneurial Finance 3 Credits
- MG-GY 8721 Introduction to Managing Growing Enterprises 1.5 Credits
- MG-GY 8731 Introduction to Corporate Entrepreneurship 1.5 Credits
- MG-GY 8741 Introduction to Entrepreneurial Marketing and Sales 1.5 Credits
or
- MG-GY 8743 Entrepreneurial Marketing and Sales 3 Credits

Note:

Subject to advisor's approval students can also take an elective course at other Schools of NYU. For example, Biotechnology and Entrepreneurship students can select a course at NYU Stern School of Business.

Projects

Students may take up to three Projects in Biotechnology and Entrepreneurship:

- BTE-GY 9503 Project in Biotechnology and Entrepreneurship 3 Credits
- BTE-GY 9513 Project in Biotechnology and Entrepreneurship 3 Credits
- BTE-GY 9523 Project in Biotechnology and Entrepreneurship 3 Credits

Note:

Projects in Biotechnology and Entrepreneurship count as elective courses.

Total: 30 Credits

Biotechnology, M.S.

Requirements for the Masters of Science

Students are expected to have an undergraduate degree in a science or engineering discipline and must have taken undergraduate courses in (1) biochemistry and (2) cell and molecular biology, or they may take these classes at the NYU Tandon School of Engineering. The 30-credit curriculum consists of three parts:

1. Five required courses in biotechnology, protein and tissue engineering, enzyme catalysis and biosensors (15 credits);
2. Three elective courses in biotechnology and related fields (9 credits); and
3. Two more elective courses or Guided Studies in Biotechnology, involving laboratory or literature work (6 credits).

To meet graduation requirements, students must attain an overall GPA of 3.0 (average of a B) in all their courses.

Required Courses: 15 Credits

The five required courses are listed below:

- BT-GY 6013 Biotechnology and the Pharmaceutical Industry 3 Credits
- BT-GY 6023 Biotechnology and Health Care 3 Credits
- BT-GY 6033 Biosensors and Biochips 3 Credits
- BT-GY 9053 Enzyme Catalysis in Organic Synthesis 3 Credits

Choose one of the following:

- BT-GY 6093 Biomedical Materials & Devices for Human Body Repair 3 Credits
- BT-GY 9433 Protein Engineering 3 Credits

Elective Courses: 9-15 Credits

Students must select courses from the following list:

- BE-GY 6013 Molecular Immunology 3 Credits
- BE-GY 6601 Introduction to Drug Delivery 1.5 Credits
- BE-GY 6703 Materials in Medicine 3 Credits
- BT-GY 6043 Biocatalysis in Industry 3 Credits
- BT-GY 6053 Introduction to Neuroscience for Biotechnologists 3 Credits
- BT-GY 6063 Molecular Immunology 3 Credits

- BT-GY 6073 Genetic Engineering *3 Credits*
- BT-GY 6083 Advanced Cell and Molecular Biology *3 Credits*
- BT-GY 7011 Special Topics in Biotechnology *1.5 Credits*
- BT-GY 7013 Special Topics in Biotechnology *3 Credits*
- BT-GY 7033 Business Concepts for the Biotechnology Entrepreneur *3 Credits*
- BT-GY 9443 Tissue Engineering *3 Credits*
- CM-GY 8213 Bioanalytical Chemistry *3 Credits*
- CM-GY 9423 Biochemistry II *3 Credits*
- JW-GY 6003 Introduction to Technical Communication *3 Credits*
- MG-GY 7871 Intellectual Property for Technology and Information Managers *1.5Credits*

Note:

Subject to advisor's approval students can also take an elective course and/or do research at other Schools of NYU. Typically, Biotechnology students choose NYU School of Medicine.

Guided Studies: up to 6 Credits

Students may optionally enroll in up to two Guided Studies courses (one per semester), which involve laboratory or literature work, as arranged with their advisers. Guided Studies courses count as elective courses.

- BT-GY 8713 Guided Studies in Biotechnology I *3 Credits*
- BT-GY 8723 Guided Studies in Biotechnology II *3 Credits*

Total: 30 Credits

Chemical Engineering, Guided Studies Option, M.S.

Requirements for the Master of Science in Chemical Engineering

Candidates for the MS in Chemical Engineering should plan their programs in accordance with the following list of requirements:

Guided Studies Option

- CBE-GY 902X Guided Studies in Chemical Engineering *3 Credits each, 6 Credits total*

Required (core) courses, 12 credits, 3 credits each

- CBE-GY 6153 Applied Mathematics in Engineering *3 Credits*
- CBE-GY 6333 Transport Phenomena *3 Credits*
- CBE-GY 6813 Chemical Reactor Analysis and Design *3 Credits*
- CM-GY 7043 Statistical Thermodynamics and Kinetics *3 Credits*

Electives: 12 Credits

At least two electives (6 credits) must be chosen from approved CBE graduate courses, 6000-level and above, while the other two (6 credits) may be chosen from other graduate programs with the approval of the graduate adviser in chemical engineering.

Total: 30 Credits

Note:

To meet graduation requirements, students must have an overall B average in all courses (excluding MS Thesis or Guided Study Project) and must not obtain more than two grades of C in required subjects.

Chemical Engineering, Thesis Option, M.S.

Requirements for the Master of Science in Chemical Engineering

Candidates for the MS in Chemical Engineering should plan their programs in accordance with the following list of requirements:

Thesis Option

- CBE-GY 997X MS Thesis in Chemical & Biological Engineering (*9 credits total, 3 each*)Credits

Required (core) courses, 12 credits, 3 credits each

- CBE-GY 6153 Applied Mathematics in Engineering *3 Credits*
- CBE-GY 6333 Transport Phenomena *3 Credits*
- CBE-GY 6813 Chemical Reactor Analysis and Design *3 Credits*
- CM-GY 7043 Statistical Thermodynamics and Kinetics *3 Credits*

Electives: 9 Credits

At least two electives (6 credits) must be chosen from approved CBE graduate courses, 6000-level and above, while the other one (3 credits) may be chosen from other graduate programs with the approval of the graduate adviser in chemical engineering.

Total: 30 Credits

Note:

To meet graduation requirements, students must have an overall B average in all courses (excluding MS Thesis or Guided Study Project) and must not obtain more than two grades of C in required subjects.

Chemistry, M.S.

Requirements for the Master of Science

Candidates for the MS in Chemistry plan their programs in accordance with the following list of requirements:

A. Required (core) courses, 4 courses, 3 credits each:

1. Physical chemistry

- CM-GY 7043 Statistical Thermodynamics and Kinetics *3 Credits*

2. Organic chemistry

- CM-GY 9033 Physical Organic Chemistry *3 Credits*

3. Analytical chemistry

(choose one of the following two)

- CM-GY 8023 Principles of Spectroscopy *3 Credits*
- CM-GY 8073 Organic Spectroscopy *3 Credits*

4. Inorganic chemistry, polymer chemistry, or biochemistry

(choose one of the following three)

- CM-GY 6013 Advanced Inorganic Chemistry *3 Credits*
- CM-GY 9413 Biochemistry I *3 Credits*
- CM-GY 7723 Synthesis of Macromolecules *3 Credits*

B. Seminar: 1.5 Credits

- CM-GY 9731 Seminar in Chemistry I *1.5 Credits*

C. Chemical Literature: 1.5 Credits

-
- CM-GY 5021 Information Sources for the Chemical Sciences *1.5 Credits*

D. Chemical Colloquium: 0 Credits

-
- CM-GY 9710 Chemical Colloquium *0 Credits*

E. Chemical Colloquium: 0 Credits

-
- CM-GY 9710 Chemical Colloquium *0 Credits*

F. Chemical Laboratory Safety: 0 Credits

-
- CM-GY 5040 Chemical Laboratory Safety *0 Credits*

G. Guided Studies Project: 3 Credits; or MS Thesis in Chemistry: 9 Credits

-
- CM-GY 8713 Guided Studies in Chemistry I *3 Credits*
or
 - CM-GY 997X MS Thesis in Chemistry *variable, 1-9 Credits*

H. Electives: 12 Credits, or 6 credits for students completing MS Thesis

At least two courses from CM listings, other courses from CM, BE, BT and CBE listings

Total: 30 Credits

Note:

To meet graduation requirements, students must have an overall B average in all courses (excluding seminar, chemical information and guided studies). Where CM-GY 9731 and CM-GY 5021 are not offered, they may be replaced by an elective course. Students must be in continuous attendance at the departmental colloquia (CM 9710).

Civil Engineering, M.S.

Master of Science Program in Civil Engineering

The Master of Science in Civil Engineering allows students to specialize in one of the following six areas of concentration:

- Construction Management and Engineering
- Structural Engineering
- Geotechnical Engineering
- Environmental and Water Resources Engineering
- Urban Systems Engineering and Management
- Highway and Traffic Engineering

Students also may elect to follow a general program by taking two courses across several areas of concentration. The Department of Civil and Urban Engineering also offers graduate programs in transportation planning and engineering and transportation management (see the Transportation section in this catalog), environmental science and engineering (see Environmental Engineering and Science section in this catalog), construction management and engineering (see the Construction Management section of this catalog), and urban systems engineering and management (see Urban Infrastructure Systems section in this catalog).

Goals and Objectives

The degree MS in Civil Engineering prepares graduates to practice their profession at an advanced level. Specific program objectives are to provide the skills and knowledge necessary to:

- Specialize in one of the primary subdisciplines of civil engineering or to achieve depth across a number of the subdisciplines;
- Design and analyze civil engineering infrastructure;
- Understand civil engineering materials, technologies and processes as applied to modern civil engineering infrastructure;
- Obtain civil engineering project management skills; and
- Provide a basis for continued, lifelong learning in the civil engineering profession.

Admission

Students seeking admission to the MS program should hold a bachelor's degree in civil engineering from a program accredited by the Accreditation Board for Engineering and Technology (ABET) and have a 3.0 GPA or better. Applicants lacking a BS from an ABET-accredited program in civil engineering (including those possessing undergraduate degrees in other engineering disciplines, engineering science, engineering technology and architecture, or from a foreign university) have their qualifications reviewed by a graduate adviser. Admission may be granted and may include the requirement for additional undergraduate courses to correct deficiencies. These additional courses are not counted toward the MS degree, nor are undergraduate courses included in computing graduate grade-point averages.

Applicants to the MS program should take the Graduate Record Examination (GRE Advanced Tests) and achieve a minimum grade of 155 (700 on the previous scale) on the quantitative section. Applicants from universities outside the United States must take the Test of English as a Foreign Language (TOEFL) and achieve a minimum grade of 80.

International candidates who meet all other admission requirements but who fail to satisfy the TOEFL requirement may be required to take remedial courses in English before admission.

Grade Requirements

To earn a MS degree from NYU Polytechnic School of Engineering, students must maintain a B average (3.0 GPA) or better in (1) all graduate courses taken at NYU Polytechnic School of Engineering, (2) all graduate courses taken in the Department of Civil Engineering and (3) all graduate guided studies (readings, project, thesis). Poor scholastic performance (under 3.0 GPA) may lead to a student being placed on graduate probation. If a student's grade do not improve, (s)he may be disqualified from further graduate study in the department.

In the event that an applicant is required to take undergraduate prerequisite courses as a condition of admission, a grade of B- or better is required for every prerequisite course taken, and the cumulative GPA of all required prerequisite courses must be at least 3.0.

Advising

Students are responsible for following the departmental rules outlined in this catalog. While academic advisers consult with and advise students, students are responsible for ensuring that all degree requirements are fulfilled and for submitting all proper forms and applications.

Students must meet with an academic adviser when they first enroll. Students must have a detailed program of study formally approved by an academic adviser before registration.

The academic adviser also handles requests for waivers of certain degree requirements, where warranted. Such waivers must be in writing and must be entered into the student's departmental record. Where specific courses are waived, approval of the course instructor may also be required. When waivers are granted, students may be required to take other specific courses in their place or to select additional electives. Students registering for guided studies (readings, projects, theses) are assigned advisers for each such activity. To register for guided study, students must submit written proposals for the topic(s) to be covered to such advisers before registration. To register, students must obtain written approval of the project adviser and the academic adviser.

Transfer Credits

The residency requirement for the MS degree is 24 credits. Students may transfer up to 6 credits of acceptable courses toward a MS degree, subject to their academic advisor's approval. To be transferred, the course(s) must relate to the student's program and be from an accredited institution. A grade of B or better is required for granting of transfer credit. Courses graded on a pass/fail basis are not considered for transfer unless accompanied by a detailed written evaluation by the course instructor. All transfer requests must be accompanied by an official transcript from the transferring

institution. Applications for transfer credits must be submitted for consideration before the end of the first semester of matriculation.

Validation credits by examination may not be used toward any civil engineering graduate degree program.

Degree Requirements

All MS (Civil Engineering) students must complete either the single area of concentration or general program requirements as described in Table 3:

Table 3: Avenues for Obtaining MS (Civil Engineering)

Students Selecting a Single Area of Concentration

Core Courses:	12 credits (min.)
Courses Within Concentration:	12 credits (min.)
Technical Electives:	6 credits

Students Selecting the General Program

Core Courses:	12 credits (min.)
Two Courses in each of 3 Concentration Areas:	18 credits (min.)

Credits Required for MS Degree: 30 credits

A. Core Courses: 12 Credits

Students must complete at least four of the following six core courses.

Table 4: Core Courses in Civil Engineering

- CE-GY 6023 Materials for Civil Engineers *3 Credits*
- CE-GY 6073 Instrumentation, Monitoring and Condition Assessment of Civil Infrastructure *3 Credits*
- CE-GY 7673 Environmental Impact Assessment *3 Credits*
- CE-GY 7843 Introduction to Urban Systems Engineering *3 Credits*
- CE-GY 8253 Project Management for Construction *3 Credits*
- CE-GY 8283 Risk Analysis *3 Credits*

B. Concentration Area Courses: 12 to 18 Credits

Students selecting a single area of concentration must complete: (1) at least one core course in their concentration area; and (2) at least four additional concentration area courses. The course requirements of various concentration areas are listed in Tables 5-10. All students must satisfy all course prerequisites.

C. Technical Electives: 0 to 6 Credits

Depending upon the choice of concentration area, a student may have up to an additional 6 credits of course work, which may be satisfied from the following:

Electives:

Electives are normally selected from the courses given by the Department of Civil and Urban Engineering. However, electives may be selected from courses offered by other departments with written consent of the graduate adviser.

Project:

- CE-GY 9963 MS Project in Civil & Urban Engineering *3 Credits*

Thesis:

- CE-GY 9973 Thesis for MS in Civil Engineering *6 Credits*

Table 5: Geotechnical Engineering Concentration

Select courses from:

- CE-GY 8423 Ground Improvement *3 Credits*
- CE-GY 8663 Advanced Foundation Design *3 Credits*
- CE-GY 8673 Excavation Support Systems *3 Credits*
- CE-GY 8403 Geotechnics and Geomaterials *3 Credits*
- CE-GY 8433 Urban Geotechnology *3 Credits*
- CE-GY 8493 Environmental Geotechnology *3 Credits*
- CE-GY 7233 Groundwater Hydrology and Pollution *3 Credits*
- CE-GY 8603 Selected Topics in Geotechnical Engineering *3 Credits*

Table 6: Structural Engineering Concentration

- CE-GY 6013 Theory of Structural Analysis and Design 3 Credits
- CE-GY 6163 Finite Element Methods 3 Credits
- CE-GY 6033 Selected Topics in Structural Analysis I 3 Credits
- CE-GY 6043 Selected Topics in Structural Analysis II 3 Credits
- CE-GY 6063 Bridge Engineering 3 Credits
- CE-GY 6133 Stability of Structures 3 Credits
- CE-GY 6143 Steel Structures 3 Credits
- CE-GY 6183 Concrete Structures 3 Credits
- CE-GY 6193 Wind and Earthquake Engineering 3 Credits

Table 7: Construction Management and Engineering Concentration

Graduate Construction Management and Engineering courses, including Exec 21 courses, listed are in the Construction Management section of this catalog.

Table 8: Environmental/Water Resources Engineering Concentration

Select courses from:

- CE-GY 6053 Monitoring Cities 3 Credits
- CE-GY 7223 Hydrology 3 Credits
- CE-GY 7233 Groundwater Hydrology and Pollution 3 Credits
- CE-GY 7373 Environmental Chemistry and Microbiology 3 Credits
- CE-GY 7423 Water and Wastewater Treatment 3 Credits
- CE-GY 7353 Selected Topics in Water Resources and Hydraulic Engineering I 3 Credits
- CE-GY 7393 Advanced Environmental Chemistry and Microbiology 3 Credits
- CE-GY 7433 Advanced Water and Wastewater Treatment 3 Credits
- CE-GY 7453 Water and Wastewater Treatment Laboratory 3 Credits
- CE-GY 7473 Modeling Fate and Transport of Surface Water Pollution 3 Credits
- CE-GY 7533 Hazardous/Toxic Waste Management 3 Credits
- CE-GY 7703 Solid Waste Management 3 Credits
- CE-GY 7753 Environmental Systems Management 3 Credits
- CE-GY 8493 Environmental Geotechnology 3 Credits

Table 9: Highway and Traffic Engineering Concentration

Select courses from:

- TR-GY 6313 Traffic Control and Signalization I 3 Credits
- TR-GY 6323 Traffic Control and Signalization II 3 Credits

- TR-GY 6013 Fundamental Concepts in Transportation 3 Credits
- TR-GY 6223 Intelligent Transportation Systems and Their Applications 3 Credits
- TR-GY 7033 Multimodal Transportation Safety 3 Credits
- TR-GY 7123 Management of Urban Traffic Congestion 3 Credits
- TR-GY 7323 Design of Parking and Terminal Facilities 3 Credits
- TR-GY 7343 Urban Freeways and Intercity Highways 3 Credits

Table 10: Urban Systems Engineering and Management Concentration

Select courses from:

- CE-GY 7813 Infrastructure Planning, Engineering and Economics 3 Credits
- CE-GY 7853 Concepts and Implementation of Infrastructure Management Systems 3 Credits
- CE-GY 6073 Instrumentation, Monitoring and Condition Assessment of Civil Infrastructure 3 Credits
- CE-GY 7753 Environmental Systems Management 3 Credits
- CE-GY 8713 Construction and the Law 3 Credits *
- CE-GY 8733 Infrastructure Financing: Structuring of a Deal 3 Credits *
- TR-GY 6223 Intelligent Transportation Systems and Their Applications 3 Credits

Footnote

* Students must meet the requirements for enrollment in Exec 21 courses.

Computer Engineering (Online), M.S.

Description

Computer engineers participate in some of the most forward-looking work in industry and government today, particularly telecommunications, computer networks and microelectronics. Students become resourceful experts in such dynamic fields as computer networks, VLSI design and testing, embedded systems design and computer architecture. Focusing on principles and concepts underlying the design and integration of hardware and software components and systems, this online master's in computer engineering gives students what they must know to become serious professionals, practitioners confident in electronically controlled systems and devices.

Group 1 (6 Credits): Required Courses

Core Courses-Choose 3 Out of Following

- EL-GY 6473 Introduction to VLSI System Design 3 Credits
- EL-GY 6463 Advanced Hardware Design 3 Credits
- CS-GY 6133 Computer Architecture I 3 Credits

Group 2 (21 Credits)

Other graduate ECE and CSE courses (courses with EL and CS prefixes). With adviser approval up to two courses pertinent to computer engineering can be taken from other departments at NYU.

Group 3 (3 Credits): Project Requirement

One 3-credit advanced project in ECE/CSE (EL-GY 9953 or CS-GY 9963) is required.

MS Thesis Option (6 Credits)

A thesis in ECE/CSE (EL-GY 997x/CS-GY 997X) may be selected to replace the 3-credit Advanced Project and a course from Group 2 above.

Transfer Credits

No transfer credits are accepted towards the MS degree.

Minimum Total: 30 Credits

Computer Engineering, M.S.

Degree Requirements

Entrance Requirements

Admission to the MS program requires a bachelor's degree in computer engineering, electrical engineering or computer science from an accredited institution. Students not meeting these requirements are considered for admission on an individual basis and may be admitted subject to the completion of appropriate undergraduate courses to remove any deficiencies in preparation. Topics in which deficiencies must be removed include logic circuits design, state analysis and synthesis techniques, computer architecture, data structures and algorithms and C or C++ programming.

Course Requirements

Core Courses (6 Credits):

The core courses cover fundamental material and should be taken as early as possible. An advanced course subsequent to a core course may be taken in lieu of the core course, upon approval by the program advisor. All students must choose two out of the following core courses:

- EL-GY 6473 Introduction to VLSI System Design *3 Credits*
- CS-GY 6133 Computer Architecture I *3 Credits*
- EL-GY 6463 Advanced Hardware Design *3 Credits*
- EL-GY 6523 Nanoelectronic Devices *3 Credits*

Electives (21 Credits):

Other graduate ECE and CSE courses (courses with EL and CS prefixes) including those in the core course listing that are not used to satisfy the core requirement. At least 15 out of 30 credits should be graduate ECE credits (EL numbered courses). Up to two graduate courses can be taken from other science, engineering, or management departments at NYU. The total number of credits for 5000-level EL courses and non-EL/CS courses cannot exceed 12 credits. Note that credits from 5000-level courses from other departments cannot be counted towards MS/EE degree, except with approval by the program director.

Project requirement (3 Credits):

One 3-credit advanced project in ECE/CSE (EL-GY 9953 or CS-GY 9963) is required. Certain courses with significant project component may be used to partially satisfy the project requirement, subject to approval by the program director.

MS Thesis Option (6 credits):

A thesis in ECE/CSE (EL-GY 997x/CS-GY 997X) may be selected to replace the 3-credit Advanced Project and 3 credits in the elective requirement.

Internships:

Up to 3 credits of approved internships (CP-GY 9911, CP-GY 9921, 1.5 credit each) can be applied towards the 30 credits MS degree requirement. For an internship to be approved for credits, the internship job must provide industry and/or research experience relevant to the Computer Engineering degree program. All internships must be approved and supervised by an ECE faculty member. Students must secure a faculty member's commitment for advising an internship. The internship supervisor should submit a midterm and a final term evaluation report to the advisor. The student must submit a project report to the advisor upon completion of the internship for the evaluation and grading of the internship course. The total credits for independent studies including MS thesis, projects, reading, and internship cannot exceed 9 credits within the 30 credits towards the MS degree.

Transfer Credits:

No transfer credits are accepted towards the MS degree.

GPA Requirements:

An overall GPA of 3.0 or above in all graduate courses taken at NYU is required. In addition, an average of 3.0 is required among the two core courses.

Computer Science, M.S.

Master's Degree Requirements

To satisfy the requirements for the master's degree, the student must complete 30 credits, as described below, with an overall average of B. In addition, a B average is required across the required algorithms course and the four core courses, and a grade of B or better is required for the capstone course, as indicated below. The master's curriculum has four components: 3 credits of algorithms, 12 credits of core elective courses (one of which may also count as the capstone course), one 3 credit capstone course, and 12 credits of general elective courses.

Required Course in Algorithms

Students are required to take CS-GY 6033 Design and Analysis of Algorithms I or CS-GY 6043 Design and Analysis of Algorithms II. Most students will take the Algorithms I course to satisfy the algorithms course requirement. Advanced students who have taken an equivalent Algorithms I course before with a grade of B or better will have the option of taking the Algorithms II course to satisfy the requirement.

Core Course Requirements

Students must take at least four courses from the list of core courses below. The list will be periodically updated by the CSE Department and certain courses may be substituted with departmental consent.

- CS-GY 6063 Software Engineering I *3 Credits*
- CS-GY 6083 Principles of Database Systems *3 Credits*
- CS-GY 6133 Computer Architecture I *3 Credits*
- CS-GY 6233 Introduction to Operating Systems *3 Credits*
- CS-GY 6313 Information Visualization *3 Credits*
- CS-GY 6373 Programming Languages *3 Credits*
- CS-GY 6533 Interactive Computer Graphics *3 Credits*
- CS-GY 6613 Artificial Intelligence I *3 Credits*
- CS-GY 6643 Computer Vision and Scene Analysis *3 Credits*
- CS-GY 6813 Information, Security and Privacy *3 Credits*
- CS-GY 6843 Computer Networking *3 Credits*
- CS-GY 6923 Machine Learning *3 Credits*
- CS-GY 9223 Selected Topics in Computer Science *3 Credits*

Capstone Course Requirement

Certain courses in our department will be designated as capstone courses. Capstone courses are drawn from key technical areas in the MS program and they involve a substantial amount of programming effort. Students are required to take at least one capstone course with a grade of B or better. The list of capstone courses will be posted by the department and will be updated from time to time. If a course is listed both as a capstone course and as a core course, the course can be used to satisfy both the capstone and core course requirements. An MS thesis can also be used to satisfy the capstone course requirement.

General Elective Requirements

In addition to the core electives, students are required to take four general elective courses with considerable flexibility; the only restriction is that no more than two of the courses may be taken from outside the Department of Computer Science and Engineering. In particular:

- Master's thesis (6 credits) and/or independent study courses may be part of a student's elective courses.
- Any of the courses in the 13 core areas may be chosen as electives.
- Graduate -level courses from outside of the department (at most two) may be chosen as electives.
- Any CS graduate course not included in the core areas may be chosen as electives.

These courses include (among others):

This list may be updated from time to time based on the current offerings of the department.

- CS-GY 6003 Foundations of Computer Science 3 Credits
- CS-GY 6033 Design and Analysis of Algorithms I 3 Credits
- CS-GY 6043 Design and Analysis of Algorithms II 3 Credits
- CS-GY 6063 Software Engineering I 3 Credits
- CS-GY 6073 Software Engineering II 3 Credits
- CS-GY 6083 Principles of Database Systems 3 Credits
- CS-GY 6093 Advanced Database Systems 3 Credits
- CS-GY 6133 Computer Architecture I 3 Credits
- CS-GY 6143 Computer Architecture II 3 Credits
- CS-GY 6233 Introduction to Operating Systems 3 Credits
- CS-GY 6243 Operating Systems II 3 Credits
- CS-GY 6253 Distributed Operating Systems 3 Credits
- CS-GY 6273 Performance Evaluation of Computer Systems 3 Credits
- CS-GY 6313 Information Visualization 3 Credits
- CS-GY 6323 Large-Scale Visual Analytics 3 Credits

- CS-GY 6373 Programming Languages 3 Credits
- CS-GY 6413 Compiler Design and Construction 3 Credits
- CS-GY 6533 Interactive Computer Graphics 3 Credits
- CS-GY 6543 Human Computer Interaction 3 Credits
- CS-GY 6553 Game Design 3 Credits
- CS-GY 6613 Artificial Intelligence I 3 Credits
- CS-GY 6643 Computer Vision and Scene Analysis 3 Credits
- CS-GY 6673 Neural Network Computing 3 Credits
- CS-GY 6703 Computational Geometry 3 Credits
- CS-GY 6753 Theory of Computation 3 Credits
- CS-GY 6813 Information, Security and Privacy 3 Credits
- CS-GY 6823 Network Security 3 Credits
- CS-GY 6843 Computer Networking 3 Credits
- CS-GY 6903 Applied Cryptography 3 Credits
- CS-GY 6913 Web Search Engines 3 Credits
- CS-GY 6923 Machine Learning 3 Credits
- CS-GY 6963 Digital Forensics 3 Credits
- CS-GY 9033 Web Services and SOA 3 Credits
- CS-GY 9053 Introduction to Java 3 Credits
- CS-GY 9093 Biometrics 3 Credits
- CS-GY 9103 Object Oriented Design with Java 3 Credits
- CS-GY 9133 Emerging Technology for IP 3 Credits
- CS-GY 9163 Application Security 3 Credits
- CS-GY 9223 Selected Topics in Computer Science 3 Credits

Construction Management, M.S.

Curriculum

A minimum of 15 credits (5 courses) must be selected from the following courses:

- CE-GY 7983 Selected Topics in Construction I *3 Credits*
- CE-GY 7993 Selected Topics in Construction II *3 Credits*
- CE-GY 8243 Construction Modeling Techniques *3 Credits*
- CE-GY 8253 Project Management for Construction *3 Credits*
- CE-GY 8263 Construction Cost Estimating *3 Credits*
- CE-GY 8273 Contracts and Specifications *3 Credits*
- CE-GY 8283 Risk Analysis *3 Credits*
- CE-GY 8293 Construction Operations Analysis *3 Credits*
- CE-GY 8303 Information Systems in Project Management *3 Credits*
- CE-GY 8313 Engineering for Construction I: Methods and Technologies *3 Credits*
- CE-GY 8323 Engineering for Construction II: Design *3 Credits*
- CE-GY 8333 Marketing for Construction Management and Engineering Services *3Credits*
- CE-GY 8343 Construction Site Safety *3 Credits*
- CE-GY 8353 Construction Scheduling *3 Credits*
- CE-GY 8363 Building Information Modeling Project Controls *3 Credits*
- CE-GY 8373 Construction Accounting and Finance *3 Credits*
- MG-GY 8203 Project Management *3 Credits*
- MG-GY 6013 Organizational Behavior *3 Credits*
- The following Exec21 Core Courses may be applied to the above Major Requirement by a student who is enrolled in or has completed the Exec21 Program, or by any other student with consent of a Construction Management Program Director.
 - CE 8703 Managing and Leading in the 21st Century *3 Credits*
 - CE 8713 Construction and the Law *3 Credits*
 - CE 8723 How to Succeed in Construction *3 Credits*
 - CE 8733 Infrastructure Financing: Structuring of a Deal *3 Credits*
 - CE 875X Employer Focused Residency *Up to 3 credits Credits*
 - CE 8763 Capital Program Management/Program Development *3 Credits*
 - CE 8773 Dispute Avoidance and Resolution *3 Credits*
 - CE 8783 Construction Management and Planning *3 Credits*
 - CE 8803 Infrastructure Planning for Public Works *3 Credits*

Note:

The above list is subject to change as courses are added to, or deleted from the Program.

All students must complete a minor concentration of study, which shall consist of a minimum of 6 credits (two courses), and not more than 9 credits (three courses), selected from courses in any

single graduate academic program at NYU Polytechnic School of Engineering, or any other concentrated area of study approved by a Construction Management Program Director. The selection of the minor concentration of study shall be made with the advisement and consent of a Construction Management Program Director.

A student may complete an up to three (3)-credit independent project to satisfy the Major Requirement: CE-GY 9963 MS Project in Civil & Urban Engineering.

The remaining courses needed to fulfill the 30-credit requirement shall be selected from the Civil Engineering, Transportation or Construction Management Programs (bearing a CE-GY xxxx or TR-GY xxxx designation), unless otherwise authorized by a Construction Management Program Director. However, if the minor area of study is from the Civil and Urban Engineering Department, up to two of the remaining courses may be selected from any other electives at NYU Polytechnic School of Engineering.

Note that some electives include prerequisites that not all program enrollees may have completed. Students cannot register for a course for which they have not satisfied the stated prerequisites unless they have the written permission of both the course instructor and a Construction Management Program Director.

Grade Requirements

To earn a Master of Science in Construction Management, students must maintain a B (3.0) cumulative average in all graduate courses taken at NYU Polytechnic School of Engineering.

Cybersecurity (Online), M.S.

Cybersecurity

As the demand for skilled information-security professionals continues to grow, computer and network professionals now can turn to this online, in-demand master's to emerge as sophisticated practitioners in cybersecurity, the science of protecting vital computer networks and electronic infrastructures from attack. Students acquire a solid foundation in key technologies-computer and network security, digital forensics, cryptography and biometrics. They study with internationally recognized faculty from the Information Systems and Internet Security (ISIS) Laboratory. With industry continuing to place top priority on safeguarding its data and information systems, students become well prepared for careers in developing security products, as security-application programmers, security analysts, penetration testers, vulnerability analysts and security architects.

Required Computer Science Courses: 3 Credits each

- CS-GY 6033 Design and Analysis of Algorithms I 3 Credits
- CS-GY 6233 Introduction to Operating Systems 3 Credits
- CS-GY 6843 Computer Networking 3 Credits

Required Security Core Courses: 3 Credits each

- CS-GY 6813 Information, Security and Privacy 3 Credits
- CS-GY 6823 Network Security 3 Credits
- CS-GY 6903 Applied Cryptography 3 Credits
- CS-GY 9163 Application Security 3 Credits

Select Any 3 Electives: 3 Credits each

- CS-GY 6573 Penetration Testing and Vulnerability Analysis 3 Credits
- CS-GY 6803 Information Systems Security Engineering and Management 3 Credits
- CS-GY 9093 Biometrics 3 Credits
- CS-GY 6963 Digital Forensics 3 Credits
- CS-GY 9963 Advanced Project in Computer Science 3 Credits (in the area of cybersecurity)
- CS-GY 6243 Operating Systems II 3 Credits
- CS-GY 6043 Design and Analysis of Algorithms II 3 Credits
- CS-GY 6133 Computer Architecture I 3 Credits
- **Research Project (Optional)**
- **Master's Thesis (Optional)**

Minimum Total: 30 Credits

Cybersecurity, M.S.

Master's Degree Requirements

Core Electives and Requirements

To satisfy the requirements for the Cybersecurity MS program, the student must complete 30 credits, as listed below, with an overall average of B. In addition, a B average is required across all the required core courses, as indicated below.

Computer Science Core Courses

- CS-GY 6233 Introduction to Operating Systems *3 Credits*
- CS-GY 6843 Computer Networking *3 Credits*
- CS-GY 6033 Design and Analysis of Algorithms I *3 Credits*

Security Core Courses

Most of the required Security Core courses have a project component.

- CS-GY 6813 Information, Security and Privacy *3 Credits*
- CS-GY 6823 Network Security *3 Credits*
- CS-GY 6903 Applied Cryptography *3 Credits*
- CS-GY 9163 Application Security *3 Credits*

Electives (3 courses)

Students may choose security-related courses from the NYU Tandon School of Engineering or from other schools of New York University, including courses in the psychology, law and sociology departments. Selected courses must be approved by the Program Committee. All of the following courses are preapproved; others must be approved by the Program Committee.

- CS-GY 6573 Penetration Testing and Vulnerability Analysis *3 Credits*
- CS-GY 6803 Information Systems Security Engineering and Management *3 Credits*
- CS-GY 9093 Biometrics *3 Credits*
- CS-GY 6963 Digital Forensics *3 Credits*
- CS-GY 9963 Advanced Project in Computer Science *3 Credits*
- CS-GY 6043 Design and Analysis of Algorithms II *3 Credits*
- CS-GY 6133 Computer Architecture I *3 Credits*

- CS-GY 6003 Foundations of Computer Science 3 *Credits*

Footnotes

* Any required Computer Science core courses may be replaced if the student has taken a similar class.

Research Project (Optional)

One goal of the MS in Cybersecurity is to introduce students to exciting research in cybersecurity and to attract some of them to pursue a PhD degree. To this end, NYU Tandon Online offers a semester-long Advanced Project in Computer Science (CS-GY 9963) in cybersecurity (as listed above), as an elective. Students selecting this option are guided by a research professor and gain invaluable research experience.

Preparatory Courses

We offer 3 preparatory bridge courses for students who do not have a working knowledge of a high level, general-purpose programming language or a background in sets, functions, relations, asymptotic notation, proof techniques, induction, combinatorics, discrete probability, recurrences, graphs, trees, mathematical models of computation and undecidability.

- CS-GY 5303 Introduction to Programming and Problem Solving 3 *Credits*
- CS-GY 5403 Data Structures and Algorithms 3 *Credits*
- CS-GY 6003 Foundations of Computer Science 3 *Credits*

Master's Thesis (optional)

In addition to the above semester-long, research experience for students, the program also offers research-oriented MS students the master's thesis option. With this option, a student takes 6 credits of CS-GY 997X MS Thesis in Computer Science working with a faculty adviser on a research problem in cybersecurity, in lieu of two out of the three required electives.

The research need not be original, but should demonstrate adequately the student's proficiency in the subject. An oral defense of the master's thesis before at least three professors is required. The 6 credits of master's thesis must span two consecutive semesters. Whenever relevant, 3 credits of CS-GY 9963 may be used as 3 credits of CS-GY 997X, subject to faculty-adviser approval.

Electrical Engineering (Online), M.S.

Description

Electrical engineers assume a principal role in implementing industrial infrastructure, from vast complexes to intricate applications on hand-held devices. This online Master of Science program in Electrical Engineering prepares students to embrace an advanced, highly sought-after professional career. It also gives them critical knowledge to pursue a PhD in electrical engineering. Students explore key subdisciplines in control, signal processing and computing to achieve a thorough command of the field.

Group 1: 9 Credits

Choose 2 out of following:

- EL-GY 6113 Digital Signal Processing I *3 Credits*
- EL-GY 6253 Linear Systems *3 Credits*
- EL-GY 6303 Probability and Stochastic Processes *3 Credits*
- EL-GY 6713 Electromagnetic Theory and Applications *3 Credits*

Group 2: 6-12 Credits

Choose 2 Sequences

- EL-GY 5373 Internet Architecture and Protocols *3 Credits*
- EL-GY 6013 Digital Communications *3 Credits*
- EL-GY 6023 Wireless Communications *3 Credits*
- EL-GY 6383 High-Speed Networks *3 Credits*
- EL-GY 7373 High Performance Switches and Routers *3 Credits*
- EL-GY 5673 Electronic Power Supplies *3 Credits*
- EL-GY 7133 Digital Signal Processing II *3 Credits*
- EL-GY 7353 Network Modeling and Analysis *3 Credits*

Group 3: 6-12 Credits

Approved electives may be chosen with advisor's approval from graduate offerings in EL, CS, and occasionally, pertinent courses from other departments. With adviser approval, students may select other groups or individual courses provided they relate to the various facets of computer engineering.

Minimum Total: 30 Credits

Electrical Engineering, M.S.

Requirements for the Master of Science

Entrance Requirements

Admission to the Master of Science in Electrical Engineering Program requires a Bachelor's in Electrical Engineering from an accredited institution, with a GPA of 3.0/4.0 or higher. The Graduate Record Exam (GRE) is required for all applicants.

Students not meeting these requirements will be considered for admission on an individual basis and may be admitted subject to the completion of appropriate undergraduate courses to remove deficiencies in preparation.

Course Requirements

To obtain the MS in Electrical Engineering degree, students must complete a total of 30 credits, with restrictions described below.

Degree Requirements

Core Courses:

The core courses cover fundamental material and should be taken as early as possible. An advanced course subsequent to a core course may be taken in lieu of the core course, upon approval by the MSEE program advisor. All students must choose two out of the following five core courses:

- EL-GY 6113 Digital Signal Processing I *3 Credits*
- EL-GY 6253 Linear Systems *3 Credits*
- EL-GY 6303 Probability and Stochastic Processes *3 Credits*
- EL-GY 6403 Fundamentals of Analog Integrated Circuit Design *3 Credits*
- EL-GY 6713 Electromagnetic Theory and Applications *3 Credits*

Concentration Areas:

Students are recommended to select courses to focus on one or two concentration areas, to obtain sufficient depth in the choose areas. To provide flexibility for course selection based on the student's interests, a student does not need to officially declare a concentration, and no specific number of

credits is required for each chosen concentration. For an up-to-date list of concentration areas and courses for each area, please visit the department webpage.

Thesis, project, reading:

Students are encouraged to participate in research by registering for a master's thesis (EL-GY 997x, minimal 6 credits), an advanced project (EL-GY 9953 or EL-GY 9963, 3 credits each, EL-GY 9941, 1.5 credits) or a reading course (EL-GY 9933, 3 credits). Students must secure a faculty member's commitment for advising such individual studies. Oral defense of the master's thesis with at least three professors (at least 2 ECE professors) in attendance is required. For the project and reading courses, a project report and an oral presentation is required. The total credits for thesis, projects, readings, and internships (see below) should not exceed 9 credits within the 30 credits required for the MS degree.

Internships:

Up to 3 credits of approved internships (CP-GY 9911, CP-GY 9921, 1.5 credits each) can be applied towards the 30 credits MS degree requirement. For an internship to be approved for credits, the internship job must provide industry and/or research experience relevant to the degree program. All internship must be approved and supervised by an ECE faculty member. Students must secure a faculty member's commitment for advising an internship. The internship supervisor should submit a midterm and a final term evaluation report to the advisor. The student must submit a project report to the advisor upon completion of the internship for the evaluation of the internship course. The total credits for independent studies including MS thesis, projects, reading, and internship cannot exceed 9 credits within the 30 credits towards the MS degree.

Out-of-department courses and 5000-level EL courses:

At least 24 credits should be EL-prefixed courses. A 3-credit course taken at other science or engineering departments of NYU that is closely related to electrical engineering may be used to substitute an EL course upon approval by the MSEE program advisor. The other 6 credits can be from any science, engineering or management departments. The total number of credits for 5000-level EL courses and non-EL courses cannot exceed 12 credits. Note that credits from 5000-level courses from other departments cannot be counted towards MS/EE degree, except with approval by the program director.

Transfer Credits:

No transfer credits are accepted towards the MS degree.

GPA requirements:

An overall GPA of 3.0 or above in all graduate courses taken at NYU is required. In addition, an average of 3.0 is required among the two core courses.

Environmental Engineering, M.S.

Goals and Objectives

The MS in Environmental Engineering prepares graduates to plan, functionally design, control, operate and manage municipal and industrial pollution-prevention systems. Students are exposed to a learning atmosphere that provides a mix of theoretical and practical approaches. Courses include a mix of presentations, project exercises and practical problem solutions.

Specific program objectives are to provide the skills necessary to:

- fundamentally understand the science and engineering of natural and man-made environmental systems;
- functionally design air, water and waste treatment systems and components;
- control and operate environmental facilities;
- understand the modeling and simulation of environmental systems; and
- participate actively in multidisciplinary teams to solve environmental problems.

Program Requirements

Core Courses: 12 Credits

- CE-GY 7373 Environmental Chemistry and Microbiology 3 Credits
- CE-GY 7423 Water and Wastewater Treatment 3 Credits

and select 2 of the following 4 courses:

- CE-GY 7223 Hydrology 3 Credits
- CE-GY 7233 Groundwater Hydrology and Pollution 3 Credits
- CE-GY 7753 Environmental Systems Management 3 Credits
- CE-GY 7673 Environmental Impact Assessment 3 Credits

Major Courses: 9 Credits

Select 3 of the following 5 courses:

- CE-GY 7393 Advanced Environmental Chemistry and Microbiology 3 Credits
- CE-GY 7433 Advanced Water and Wastewater Treatment 3 Credits
- CE-GY 7473 Modeling Fate and Transport of Surface Water Pollution 3 Credits
- CE-GY 8493 Environmental Geotechnology 3 Credits
- CE-GY 7703 Solid Waste Management 3 Credits

- CE-GY 8283 Risk Analysis *3 Credits*

Master Project or Thesis: 3-6 Credits

- CE-GY 9963 MS Project in Civil & Urban Engineering *3 Credits*
- CE-GY 9973 Thesis for MS in Civil Engineering
6 Credits

Electives: 3-6 Credits

3-6 credits of approved engineering and science electives

Total: 30 Credits

Environmental Science, M.S.

Goals and Objectives

The primary goal of the MS in Environmental Science is to prepare professionals to:

- fundamentally understand the science and applied engineering of natural and manmade environmental systems;
- evaluate the interactions between man and the environment and control adverse impacts of pollution on ecological systems;
- understand the monitoring and laboratory analysis of environmental systems; and
- participate actively in a multidisciplinary team of professionals to solve environmental problems.

Program Requirements

1. Core Courses: 9 Credits

- CE-GY 7373 Environmental Chemistry and Microbiology *3 Credits*
- CE-GY 7423 Water and Wastewater Treatment *3 Credits*
- CE-GY 7223 Hydrology *3 Credits*

2. Twelve credits of approved courses

Courses may be taken in Environmental Engineering, Chemical and Biological Engineering at NYU SOE, and NYU Environmental Health Science, including up to 6 approved transfer credits.

Suggested Courses:

- CE-GY 7233 Groundwater Hydrology and Pollution *3 Credits*
- CE-GY 7393 Advanced Environmental Chemistry and Microbiology *3 Credits*
- CE-GY 7433 Advanced Water and Wastewater Treatment *3 Credits*
- CE-GY 7473 Modeling Fate and Transport of Surface Water Pollution *3 Credits*
- CE-GY 7673 Environmental Impact Assessment *3 Credits*
- CE-GY 7703 Solid Waste Management *3 Credits*
- CE-GY 7753 Environmental Systems Management *3 Credits*
- CE-GY 7523 Air Pollution *3 Credits*
- CE-GY 7553 Environmental Toxicology *3 Credits*
- CE-GY 9963 MS Project in Civil & Urban Engineering *3 Credits*
- CE-GY 997X MS Thesis in Civil & Urban Engineering Department *6 Credits*

- BIOL-GA 1004 Environmental Health (NYU CAS) 3 Credits
- EHSC-GA 1010 Weather, Air pollution and Health (NYU CAS) 3 Credits
- EHSC-GA.1006 Toxicology (NYU CAS) 3 Credits
- CE-GY 6053 Monitoring Cities 3 Credits

3. Nine credits of approved elective courses

Total: 30 Credits

Financial Engineering, Computational Finance Track, M.S.

COMPUTATIONAL FINANCE TRACK

The Computational Finance Track emphasizes both financial quantitative theory and practice, bridging the two and using both the fundamental concepts of finance and the stochastic and optimization methods and software in finance. This track is meant for those individuals with a strong desire to become quantitative financial managers or to pursue applied finance research interests in cutting-edge investment science, trading and in financial risk management. Techniques such as quantitative finance, financial econometrics, stochastic modeling, simulation and optimization are part of a set of financial tools applied to the many problems of derivatives and options finance, arbitrage trading algorithms, asset pricing, credit risk and credit derivatives, developing new derivative products and the many areas where quant finance has a contribution to make.

Graduates of the Computational Finance Track will be qualified to work in pricing financial risk and their management, in credit risk and their derivatives, in cutting-edge institutions, in quant hedge funds and in research and advanced product development departments of financial and consulting firms. Graduates of the Risk Finance Track will have the qualification and abilities to become responsible specialists for positions in finance, credit granting firms, banks and insurance companies, as well as obtain the knowledge needed to face the upcoming complex problems arising by the increased use and centrality of financial insurance products (contributing to the development of complex financial products and a convergence) of finance and insurance. The complementary actuarial profession is a discipline that uses tools from statistics, probability theory and finance to analyze and solve practical problems in insurance and financial risk management. Actuaries assemble and analyze data to estimate the probability and likely cost of an event such as death, sickness, injury, disability or loss of property. Courses in risk finance provide the background for the first four actuarial examinations supervised by the Society of Actuaries and the Casualty Actuarial Society and cover additional educational experience requirements.

Required to Complete the Financial Engineering MS program

- 5 core courses, each 3 credits totaling 15 credits
- Track-required courses totaling 7.5 credits
- 1 required applied lab worth 1.5 credits
- 6 credits of electives
- 1 capstone experience of 3 credits
- Capstone assessment (0 credits)
- Bloomberg Certification (0 credits)

Total # of credits: 33

Core Courses (15 Credits)

- FRE-GY 6003 Financial Accounting 3 Credits
- FRE-GY 6023 Economic Foundations in Finance 3 Credits
- FRE-GY 6083 Quantitative Methods in Finance 3 Credits
- FRE-GY 6103 Corporate Finance 3 Credits
- FRE-GY 6123 Financial Risk Management and Asset Pricing 3 Credits

Track-Required Course

- FRE-GY 6233 Options Pricing & Stochastic Calculus 3 Credits

3 of the Following Courses

Students may choose from the courses below to fill the electives requirement in addition to the options in the Recommended Electives section.

- FRE-GY 6251 Numerical and Simulation Techniques in Finance 1.5 Credits
- FRE-GY 6311 Dynamic Assets and Options Pricing 1.5 Credits
- FRE-GY 6331 Financial Risk Management & Optimization 1.5 Credits
- FRE-GY 6351 Econometrics and Time Series Analysis 1.5 Credits
- FRE-GY 6491 Credit Risk & Financial Risk Management 1.5 Credits
- FRE-GY 6711 Quantitative Portfolio Management 1.5 Credits
- FRE-GY 6971 Selected Topics in Financial Engineering: FINANCIAL ANALYTICS 1.5Credits

Recommended Electives (6 Credits)

- FRE-GY 6041 Extreme Risk Analytics 1.5 Credits
- FRE-GY 6961 Selected Topics in Financial Engineering 1.5 Credits
- FRE-GY 7121 Statistical Arbitrage 1.5 Credits
- FRE-GY 7821 Topics in Risk Finance I 1.5 Credits
- FRE-GY 7831 Topics in Financial and Risk Engineering I: FINANCIAL ANALYTICS & BIG DATA 1.5 Credits
- FRE-GY 7851 Topics in Financial and Risk Engineering II 1.5 Credits

Recommended Lab

- FRE-GY 6831 Computational Finance Laboratory 1.5 Credits

Financial Engineering, Financial Markets and Corporate Finance Track, M.S.

The Financial Markets and Corporate Finance track focuses on how to structure, value, market and apply complex financial products in expanding global financial markets. You will learn to wield sophisticated trading and risk management strategies and engineer solutions to the host of financial problems faced by today's institutions. As a student in this track, you will learn a diverse array of skills to prepare you for wide-ranging positions in corporate financial analysis, financial planning, financial consulting, asset management, management consulting, private equity value creation and global financial advisory and foreign exchange trading.

Graduates of the Financial Markets and Corporate Finance Track are expected to seek positions in financial management groups, on trading and arbitrage desks, in product structuring groups, in derivatives groups, in investment banking departments and in the information-technology firms that support the trading operations of financial institutions.

Required to Complete the Financial Engineering MS program

- 5 core courses, each 3 credits totaling 15 credits
- Track-required courses totaling 7.5 credits
- 1 required applied lab worth 1.5 credits
- 6 credits of electives
- 1 capstone experience of 3 credits
- Capstone assessment (0 credits)
- Bloomberg Certification (0 credits)

Total # of credits: 33

Core Courses (15 Credits)

- FRE-GY 6003 Financial Accounting *3 Credits*
- FRE-GY 6023 Economic Foundations in Finance *3 Credits*
- FRE-GY 6083 Quantitative Methods in Finance *3 Credits*
- FRE-GY 6103 Corporate Finance *3 Credits*
- FRE-GY 6123 Financial Risk Management and Asset Pricing *3 Credits*

Track-Required Course

- FRE-GY 6273 Valuations & Corporate Finance *3 Credits*

3 of the Following Courses

Students may choose from the courses below to fill the electives requirement in addition to the options in the Recommended Electives section.

- FRE-GY 6031 Money, Banking and Financial Markets *1.5 Credits*
- FRE-GY 6091 Financial Econometrics *1.5 Credits*
- FRE-GY 6351 Econometrics and Time Series Analysis *1.5 Credits*
- FRE-GY 6361 Corporate and Financial Strategy *1.5 Credits*
- FRE-GY 6391 Mergers & Acquisitions *1.5 Credits*
- FRE-GY 6411 Fixed Income Securities and Interest Rate Derivatives *1.5 Credits*
- FRE-GY 6671 Global Finance *1.5 Credits*
- FRE-GY 6711 Quantitative Portfolio Management *1.5 Credits*

Recommended Electives (6 Credits)

- FRE-GY 6041 Extreme Risk Analytics *1.5 Credits*
- FRE-GY 6111 Investment Banking and Brokerage *1.5 Credits*
- FRE-GY 6211 Financial Market Regulation *1.5 Credits*
- FRE-GY 6291 Applied Derivative Contracts *1.5 Credits*
- FRE-GY 6371 Contract Economics *1.5 Credits*
- FRE-GY 6451 Behavioral Finance *1.5 Credits*
- FRE-GY 6491 Credit Risk & Financial Risk Management *1.5 Credits*
- FRE-GY 6571 Asset-Backed Securities and Securitization *1.5 Credits*
- FRE-GY 6951 Selected Topics in Financial Engineering *1.5 Credits*
- FRE-GY 7241 Algorithmic Portfolio Management *1.5 Credits*
- FRE-GY 7801 Topics in Finance and Financial Markets I *1.5 Credits*
- FRE-GY 7831 Topics in Financial and Risk Engineering I: FINANCIAL ANALYTICS & BIG DATA *1.5 Credits*
- FRE-GY 7851 Topics in Financial and Risk Engineering II *1.5 Credits*

Recommended Lab

- FRE-GY 6821 Financial Econometric Laboratory *1.5 Credits*

Financial Engineering, M.S.

The Master of Science Program

The Master of Science in Financial Engineering (FE) is a 33-credit program designed to provide students with the skills required to operate at the cutting-edge of financial engineering in today's financial services industry. The program is rigorous, demanding and selective. The MS in Financial Engineering is a well-established program with a diverse curriculum. Our faculty are recognized leaders in their fields, all with extensive practical expertise. They produce world-class research while teaching both introductory and advanced courses in small class settings. The financial and practical components of the educational program have been further strengthened by developing a large and versatile body of adjunct faculty consisting of leading financial market practitioners from major Wall Street firms as well as international affiliated faculty. These adjunct faculty members work closely with full-time faculty emphasizing both applied and theoretical research in bringing to financial engineering students a greater sensitivity to the needs and the demands of financial markets and the management of financial services and institutions.

To earn a Master of Science in Financial Engineering, students must complete 33 credits to qualify for graduation. The structure of the program is as follows:

- 5 core courses, each 3 credits
- Track-required courses totaling 7.5 credits
- 1 required applied lab worth 1.5 credits
- 4 general elective courses, each 1.5 credits
- 1 capstone experience of 3 credits
- Bloomberg certification (0 credits)
- Capstone assessment (0 credits)
- Total # of credits: 33

Students may choose from one of following tracks, or create their own, as they earn their degree:

- Financial Markets and Corporate Finance
- Computational Finance
- Technology and Algorithmic Finance
- Risk Finance

The program prepares its graduates to enter fast-moving, highly rewarding careers spanning the many occupations prevalent in financial services and related industries. The educational program is continuously updated and adapted to the changing financial environment.

Admissions

The Department receives a large number of applications every year. To be considered for admission into the MS in Financial Engineering program, students must have a Bachelor's Degree from an accredited institution and proven mathematical mastery of:

- Linear Algebra
- Probability Theory
- Calculus (Advanced)

- Applied Statistics
- Computer Programming

Applicants must submit official transcripts from each institution attended as well as GRE test scores. When applicable, applicants must also demonstrate English language proficiency to be determined by the TOEFL score.

The FRE department does not accept change-of- major requests. In all instances, students must formally apply to the program. Applicants must have demonstrated proficiency in the mathematical areas listed to be considered for admission. The Department offers optional refresher courses for students who would like to brush up on their skills and to serve the population of students who have been out of academia prior to matriculating into this program.

For questions about the application process, application status or to talk to an admissions counselor, please contact:

Office of Graduate Enrollment Management and Admissions

NYU Tandon School of Engineering

Six MetroTech Center

Brooklyn, NY 11201

engineering.gradinfo@nyu.edu

Phone: 646.997.3182

Fax: 646.997.3624

Financial Engineering, Risk Track, M.S.

The Risk track presents a comprehensive approach to managing risk in the context of globalized markets, financial compliance, multi-dimensional regulatory environments and industry convergence across the financial spectrum. This specialization will prepare you for a challenging career in risk finance, insurance, credit risk and derivatives or financial risk management.

Challenges faced by practitioners of risk include:

1. Managing financial, extreme and cyber risks in an era of uncertainty and global markets in turmoil and out of equilibrium.
2. Developing financial products that are robust and anti-fragile to value risks and allow the safe transfer and the securitization of risks to better access financial liquidity and financial risk exchanges. Both, optional financial products such as credit derivatives and financial insurance products are introduced, priced and managed to prevent financial losses and to hedge trading bets.
3. Corporate Finance Risk Management, embedded in financial risk management of banks and other industrial and financial institutions.
4. Financial regulation to better comprehend the complexity and complying to multiple regulation agencies as well as global regulation currently at the forefront of financial authorities.
5. Financial Analytics to better measure risks, price and manage trading risks in an environment where stealth trading, high frequency trading, uncertainty and multi-agents finance prevail. In such an environment a greater appreciation of out-of- equilibrium (incomplete) finance, statistical tools, big-data finance and financial technology to track, assess and control become essential tools to engineer financial risk management.
6. Market Risk Analytics in banks, investment management firms and hedge funds.
7. Operational Risk Management to implement the company's operational risk framework.
8. Quantitative Model Risk and model validation including the implementation process, reviewing model standards, assessing risk mitigation policies and monitoring risk events.

The job opportunities open to graduates in the Risk Finance Track are expanding and may include jobs in Credit Risk, Derivatives and Management in Loan Firms and Banks, Insurance and their use of financial Instruments, Regulation, within Agencies with responsibilities over Financial Institutions (such as the Treasury-The OCC, The SEC, etc. As well as Compliance Management, in particular in the Banking sector, in Hedge Funds and in numerous Regulated Institutions, Investment and Hedge funds and Corporate Financial Risk Management.

Required to Complete the Financial Engineering MS program

- 5 core courses, each 3 credits totaling 15 credits
- Track-required courses totaling 7.5 credits
- 1 required applied lab worth 1.5 credits
- 6 credits of electives
- 1 capstone experience of 3 credits
- Capstone assessment (0 credits)

- Bloomberg Certification (0 credits)

Total # of credits: 33

Core Courses (15 Credits)

- FRE-GY 6003 Financial Accounting *3 Credits*
- FRE-GY 6023 Economic Foundations in Finance *3 Credits*
- FRE-GY 6083 Quantitative Methods in Finance *3 Credits*
- FRE-GY 6103 Corporate Finance *3 Credits*
- FRE-GY 6123 Financial Risk Management and Asset Pricing *3 Credits*

7.5 credits are required from the following

Students may choose from the courses below to fill the electives requirement in addition to the options in the Recommended Electives section.

- FRE-GY 6041 Extreme Risk Analytics *1.5 Credits*
- FRE-GY 6131 Clearing and Settlement and Operational Risk *1.5 Credits*
- FRE-GY 6141 Static and Dynamic Hedging *1.5 Credits*
- FRE-GY 6211 Financial Market Regulation *1.5 Credits*
- FRE-GY 6223 Actuarial Models *3 Credits*
- FRE-GY 6351 Econometrics and Time Series Analysis *1.5 Credits*
- FRE-GY 6731 Basel 3 & Banking Assets Management *1.5 Credits*
- FRE-GY 6941 Special Topics in Applied Credit Derivatives & Securitization *1.5 Credits*

Recommended Electives (6 credits)

- FRE-GY 6051 Insurance Finance and Actuarial Science *1.5 Credits*
- FRE-GY 6091 Financial Econometrics *1.5 Credits*
- FRE-GY 6291 Applied Derivative Contracts *1.5 Credits*
- FRE-GY 6331 Financial Risk Management & Optimization *1.5 Credits*
- FRE-GY 6411 Fixed Income Securities and Interest Rate Derivatives *1.5 Credits*
- FRE-GY 6491 Credit Risk & Financial Risk Management *1.5 Credits*
- FRE-GY 6971 Selected Topics in Financial Engineering: FINANCIAL ANALYTICS *1.5Credits*

Lab Requirement

Students must choose one lab from the following:

- FRE-GY 6811 Financial Software Laboratory *1.5 Credits*
- FRE-GY 6821 Financial Econometric Laboratory *1.5 Credits*
- FRE-GY 6831 Computational Finance Laboratory *1.5 Credits*

- FRE-GY 6861 Financial Software Engineering Laboratory *1.5 Credits*
- FRE-GY 6871 R in Finance *1.5 Credits*
- FRE-GY 6883 Financial Computing *3 Credits*
- Please note: for FRE-GY 6883, 1.5 credits count as lab and 1.5 credits as elective.

Financial Engineering, Technology and Algorithmic Finance Track, M.S.

Graduates of the Technology and Algorithmic Finance Track are actively involved in the development and implementation of the entire spectrum of algorithmic trading strategies, software applications, databases and networks used in modern financial services firms. The techniques it applies bridge computer science and finance to prepare graduate to participate in large-scale and mission-critical projects. Applications include high frequency finance, behavioral finance, agent-based modeling and algorithmic trading and portfolio management.

Upon graduation, students of the Technology and Algorithmic Finance track will have developed software projects ranging from behavioral models to bespoke derivative valuations to financial trading, information management and tools and financial platforms. Students would be familiar with the use and role of technology in front, middle, and back offices; common trading strategies and how to implement and back-test them; and how to create new models and build new useful tools quickly.

Required to Complete the Financial Engineering MS program

- 5 core courses, each 3 credits totaling 15 credits
- Track-required courses totaling 7.5 credits
- 1 required applied lab worth 1.5 credits
- 6 credits of electives
- 1 capstone experience of 3 credits
- Capstone assessment (0 credits)
- Bloomberg Certification (0 credits)

Total # of credits: 33

Core Courses (15 Credits)

- FRE-GY 6003 Financial Accounting *3 Credits*
- FRE-GY 6023 Economic Foundations in Finance *3 Credits*
- FRE-GY 6083 Quantitative Methods in Finance *3 Credits*
- FRE-GY 6103 Corporate Finance *3 Credits*
- FRE-GY 6123 Financial Risk Management and Asset Pricing *3 Credits*

Track-Required Course

- FRE-GY 6153 Foundations of Financial Technology *3 Credits*

3 Courses from the Following

Students may choose from the courses below to fill the electives requirement in addition to the options in the Recommended Electives section.

- FRE-GY 6131 Clearing and Settlement and Operational Risk *1.5 Credits*
- FRE-GY 6883 Financial Computing *3 Credits*
- FRE-GY 7121 Statistical Arbitrage *1.5 Credits*
- FRE-GY 7211 Forensic Financial Technology and Regulatory Systems *1.5 Credits*
- FRE-GY 7221 Big Data in Finance *1.5 Credits*
- FRE-GY 7251 Algorithmic Trading & High-Frequency Finance *1.5 Credits*
- FRE-GY 7261 News Analytics and Strategies *1.5 Credits*

Recommended Electives (6 Credits)

- FRE-GY 6041 Extreme Risk Analytics *1.5 Credits*
- FRE-GY 7831 Topics in Financial and Risk Engineering I: FINANCIAL ANALYTICS & BIG DATA *1.5 Credits*
- FRE-GY 7851 Topics in Financial and Risk Engineering II *1.5 Credits*
- FRE-GY 6251 Numerical and Simulation Techniques in Finance *1.5 Credits*
- FRE-GY 6451 Behavioral Finance *1.5 Credits*
- FRE-GY 7241 Algorithmic Portfolio Management *1.5 Credits*
- FRE-GY 7801 Topics in Finance and Financial Markets I *1.5 Credits*
- FRE-GY 6511 Derivatives Algorithms *1.5 Credits*

Recommended Lab (1.5 credits)

The following are recommended labs for this track:

- FRE-GY 6883 Financial Computing *3 Credits*
- For FRE-GY 6883, 1.5 credits count as lab and 1.5 credits as elective.
- FRE-GY 6871 R in Finance *1.5 Credits*

Industrial Engineering (Online), M.S.

Description

Industrial engineers are key professionals who explore how industrial systems work and spearhead effective and efficient delivery of quality products and services. In this online Master of Science in Industrial Engineering, students learn to exploit analytic modeling, system simulation, queuing systems, work design, project planning, facilities design and quality management and control, practices that are fast becoming essential in global industry.

Required Core Courses: 12 Credits

- IE-GY 6113 Quality Control and Improvement *3 Credits*
- IE-GY 6213 Facility Planning and Design *3 Credits*
- IE-GY 6823 Factory Simulation *3 Credits*
- MN-GY 7893 Production Science *3 Credits*

Additional Requirements

- 9 Credits with Either IE or MN Designation
- Elective 9 credits (course selection optional)

Minimum Total: 30 Credits

Industrial Engineering, M.S.

Requirements for the Master of Science

The general Polytechnic requirements for the degree Master of Science are stated in this catalog under "Graduate Degrees and Advanced Certificates". Detailed requirements for this degree are shown below.

Admission to the Master of Science program requires a bachelor's degree in a related discipline from an accredited institution. Applicants should have a superior undergraduate academic record. Students who do not meet these requirements are considered individually for admission and may be admitted subject to their completion of courses to remove deficiencies. Students are encouraged to seek waivers (and have approved substitutes designated) for all required courses in which they can demonstrate competence, thereby using their time effectively.

Prerequisite Courses (or equivalent knowledge)

Students must have knowledge of engineering economics and probability and statistics. Prospective students lacking the relevant knowledge may satisfy the requirement by taking probability and statistics (MA-GY 6513 or equivalent).

Up to 3 credits of graduate courses in this category of prerequisite knowledge can be counted toward the degree as electives, although the electives needed for the student's concentration also must be satisfied.

Required Core Courses: 12 Credits

- IE-GY 6113 Quality Control and Improvement *3 Credits*
- IE-GY 6213 Facility Planning and Design *3 Credits*
- IE-GY 6823 Factory Simulation *3 Credits*
- MN-GY 7893 Production Science *3 Credits*

Other Courses: 18 Credits

Students must take three electives from manufacturing or industrial engineering for a total of 9 credits.

The following courses can be used to fulfill the elective requirements for the Masters in Industrial (IE) engineering. Students can also elect to take an additional three courses/nine credits outside of the MN/IE curriculum with approval from their academic advisor.

- MG-GY 6303 Operations Management 3 Credits
- MG-GY 6343 Human Capital Engineering & Analytics 3 Credits
- MG-GY 6361 Managing Business Process Reengineering 1.5 Credits
- MG-GY 6293 Managing Technical Professionals 3 Credits
- MG-GY 6353 Quality Management 3 Credits
- MG-GY 6463 Supply Chain Management 3 Credits
- MG-GY 8573 Managing Cleantech and Renewable Energy Innovation 3 Credits
- MG-GY 8643 New Product Development 3 Credits
- MG-GY 8653 Managing Technological Change and Innovation 3 Credits

Total: 30 Credits

Note:

Students should elect other courses in consultation with their adviser. Concentrations in areas suited to students' career interest are encouraged (e.g., manufacturing, mechanical engineering, operations management, construction management and management of technology). Courses from computer science or management may supplement such a concentration.

Integrated Digital Media, M.S.

Degree Requirements for the Master of Science

Students must complete 30 credits in a minimum of three semesters, but no more than ten to obtain a Master of Science in Integrated Digital Media. Students typically take a four course load (3 credits per course) in the fall and spring of their first year. Students must enroll in MS Pre-Thesis and MS Thesis in their final two consecutive semesters (not simultaneously). Below is the distribution of credit requirements.

Typical Course of Study for the Master of Science in Integrated Digital Media (POSSIBLE OUTLINE)

First Semester, Fall

- DM-GY 6043 Theories and Cultural Impact of Media & Technology *3 Credits*
- DM-GY 6053 Ideation & Prototyping *3 Credits*
- DM-GY 6063 Creative Coding *3 Credits*
- Elective
- DM-GY 9990 Graduate Colloquium *0 Credits*

Second Semester, Spring

- DM-GY 7033 Media Law *3 Credits*
- DM-GY 9963 MS Pre-Thesis in Digital Media: Research Methods *3 Credits*
- DM-GY 9990 Graduate Colloquium *0 Credits*
- Elective
- Elective or Internship

Third Semester, Fall

- DM-GY 9990 Graduate Colloquium *0 Credits*
- Elective
- DM-GY 997X MS Thesis in Integrated Digital Media *3 Credits*

If beginning in a Spring Term (POSSIBLE OUTLINE):

First Semester, Spring

- DM-GY 7033 Media Law *3 Credits*
- DM-GY 9990 Graduate Colloquium *0 Credits*
- DM-GY 6053 Ideation & Prototyping *3 Credits*
- Elective
- Elective

Second Semester, Fall

- DM-GY 6043 Theories and Cultural Impact of Media & Technology *3 Credits*
- DM-GY 6063 Creative Coding *3 Credits*
- Elective
- DM-GY 9990 Graduate Colloquium *0 Credits*
- DM-GY 9963 MS Pre-Thesis in Digital Media: Research Methods *3 Credits*

Third Semester, Spring

- DM-GY 9990 Graduate Colloquium *0 Credits*
- Elective
- DM-GY 997X MS Thesis in Integrated Digital Media *3-6 Credits*

Management (MSM), Construction Management Concentration, M.S.

For further information, consult the [Master of Science in Management Program](#) page.

The MS Management Curriculum

1. Core Courses

The six required core courses shown below provide an 18 credit foundation upon which students can pursue cutting-edge specializations within the degree program. These core courses expose students to the disciplines required of a professional manager. Students who have taken these courses elsewhere or previously at the NYU Tandon School of Engineering, or who have had equivalent experience, may apply to substitute elective courses for such core courses; however, all students are required to complete the MSM degree's 36 credits.

- MG-GY 6013 Organizational Behavior 3 Credits
- MG-GY 6073 Marketing 3 Credits
- MG-GY 6083 Economics 3 Credits
- MG-GY 6093 Accounting and Finance 3 Credits
- MG-GY 6503 Management of Information Technology and Information Systems 3Credits
- MG-GY 8673 Technology Strategy 3 Credits

Note:

Core courses should be taken as early in the program as possible.

2. Areas of Concentration

Students must formally choose and declare a 15 credit area of concentration, which can be from among those listed below or, with the MSM Program Director's pre-approval, a set of courses that meet individual needs through a custom MSM concentration. A minimum of four courses must be selected in any one concentration area. Courses in all the available concentrations are shown below.

3. Capstone Project Course

This required, integrating three-credit course, MG-GY 9703 Project in Strategy and Innovation, is recommended for a student's final semester. In special cases, MG-GY 997X MS Thesis in Technology Management may be substituted for students wishing to produce a major dissertation in a specialty with the permission of the MSM Program Director and the TM&I Chair. Such a student must follow the Master's Thesis course requirements.

Concentration Course Requirements

Each MSM concentration sequence comprises a minimum of five courses totaling 15 credits. Substitutions may be made with the MSM Program Director's pre-approval in any concentration area.

Construction Management

The Concentration in Construction Management enables engineers and other construction-industry professionals to understand relevant managerial and physical, infrastructural-technological developments. The concentration also helps students become effective and innovative by integrating construction and management.

Required:

- MG-GY 6303 Operations Management *3 Credits*
- MG-GY 8203 Project Management *3 Credits*

Select Three:

Three 3 credit Construction Management Electives (CE-GY XXXX), which satisfy the major requirement for the Construction Management, M.S., are required as courses of interest. One optional minimum 3 credit MSM Restricted Concentration Elective is permitted as a course of interest selection.

Note:

** For complete Construction Management course descriptions please see course listings in the NYU Tandon School of Engineering Bulletin section of the Construction Management Program. Registration may require permission from a Construction Management adviser.

Management (MSM), Design Innovation Concentration, M.S.

For further information, consult the [Master of Science in Management Program](#) page.

The MS Management Curriculum

1. Core Courses

The six required core courses shown below provide an 18 credit foundation upon which students can pursue cutting-edge specializations within the degree program. These core courses expose students to the disciplines required of a professional manager. Students who have taken these courses elsewhere or previously at the NYU Tandon School of Engineering, or who have had equivalent experience, may apply to substitute elective courses for such core courses; however, all students are required to complete the MSM degree's 36 credits.

- MG-GY 6013 Organizational Behavior 3 Credits
- MG-GY 6073 Marketing 3 Credits
- MG-GY 6083 Economics 3 Credits
- MG-GY 6093 Accounting and Finance 3 Credits
- MG-GY 6503 Management of Information Technology and Information Systems 3Credits
- MG-GY 8673 Technology Strategy 3 Credits

Note:

Core courses should be taken as early in the program as possible.

2. Areas of Concentration

Students must formally choose and declare a 15 credit area of concentration, which can be from among those listed below or, with the MSM Program Director's pre-approval, a set of courses that meet individual needs through a custom MSM concentration. A minimum of four courses must be selected in any one concentration area. Courses in all the available concentrations are shown below.

3. Capstone Project Course

This required, integrating three-credit course, MG-GY 9703 Project in Strategy and Innovation, is recommended for a student's final semester. In special cases, MG-GY 997X MS Thesis in Technology Management may be substituted for students wishing to produce a major dissertation in a specialty with the permission of the MSM Program Director and the TM&I Chair. Such a student must follow the Master's Thesis course requirements.

Concentration Course Requirements

Each MSM concentration sequence comprises a minimum of five courses totaling 15 credits. Substitutions may be made with the MSM Program Director's pre-approval in any concentration area.

Design Innovation

This is an inter-disciplinary, multi-department MSM Concentration which is configured for students and professionals alike interested in pursuing management positions in industrial design environments. There is an emphasis on product design. This MSM Concentration is coordinated jointly with the MS in Management and the MS in Industrial Engineering and Manufacturing Engineering Programs of TM&I. To follow this Concentration, prior approval from both MSM and IE/MN Program Directors is required. Students are advised that modules should be followed in sequence (module 1, 2, and then 3).

Required: 9 Credits (Design Foundations: Module 1)

- MN-GY 6513 Design Strategies 3 Credits
- IE-GY 7653 Human Factors in Engineering Design Credits
- MG-GY 9013 Design Thinking for Creative Problem Solving 3 Credits
Or with permission of MSM & MN/IE & IDM Program Directors:
- DM-GY 6053 Ideation & Prototyping 3 Credits ¹

Required: 3 Credits (Specialization: Module 2)

Students must select one 3-credit course from the list below.

- MG-GY 8643 New Product Development 3 Credits
- MN-GY 7943 Physical Design of Products 3 Credits ²
- MN-GY 7713 Product Realization Process 3 Credits
- IE-GY 7923 Design for Manufacturability 3 Credits
Or
An MSM Restricted Elective as a Specialization Module 2 Course 3 Credits ³

Required: 3 Credits (Experiential: Module 3)

Students must select one 3-credit course from the list below.

- MG-GY 9753 Selected Topics in Management *3 Credits*
- DM-GY 9103 Special Topics in Digital Media *3 Credits* (Topic: Digital Fabrication) ¹
- MG-GY 9683 Internship and Action Learning *3 Credits*

Footnotes

¹ May require special pre-approval from Integrated Digital Media Program Director. This course currently is NOT cross-listed with Management.

² This course may be selected only with the permission of MSM & MN/IE Program Directors.

³ MSM students are permitted to choose one optional MSM Restricted Concentration Elective in their MSM Concentration course-of-interest selection as per the following guidelines: An MSM Restricted Concentration Elective is defined as any graduate management course of at least 3.0 credits from any NYU School. The student's course selection requires written pre-approval of the MSM Program Director.

Management (MSM), Electronic Business Concentration, M.S.

For further information, consult the [Master of Science in Management Program](#) page.

The MS Management Curriculum

1. Core Courses

The six required core courses shown below provide an 18 credit foundation upon which students can pursue cutting-edge specializations within the degree program. These core courses expose students to the disciplines required of a professional manager. Students who have taken these courses elsewhere or previously at the NYU Tandon School of Engineering, or who have had equivalent experience, may apply to substitute elective courses for such core courses; however, all students are required to complete the MSM degree's 36 credits.

- MG-GY 6013 Organizational Behavior *3 Credits*
- MG-GY 6073 Marketing *3 Credits*
- MG-GY 6083 Economics *3 Credits*
- MG-GY 6093 Accounting and Finance *3 Credits*
- MG-GY 6503 Management of Information Technology and Information Systems *3 Credits*
- MG-GY 8673 Technology Strategy *3 Credits*

Note:

Core courses should be taken as early in the program as possible.

2. Areas of Concentration

Students must formally choose and declare a 15 credit area of concentration, which can be from among those listed below or, with the MSM Program Director's pre-approval, a set of courses that meet individual needs through a custom MSM concentration. A minimum of four courses must be selected in any one concentration area. Courses in all the available concentrations are shown below.

3. Capstone Project Course

This required, integrating three-credit course, MG-GY 9703 Project in Strategy and Innovation, is recommended for a student's final semester. In special cases, MG-GY 997X MS Thesis in Technology Management may be substituted for students wishing to produce a major dissertation in a specialty with the permission of the MSM Program Director and the TM&I Chair. Such a student must follow the Master's Thesis course requirements.

Concentration Course Requirements

Each MSM concentration sequence comprises a minimum of five courses totaling 15 credits. Substitutions may be made with the MSM Program Director's pre-approval in any concentration area.

Electronic Business

The Electronic Business Management Concentration focuses on the arena of electronic business and the Internet. Students study the process of digital-intensive market creation and the key aspects for managing a firm that operates increasingly in digital space. Relevant methods and concepts for effective electronicbusiness decision making are explored and applied.

Required:

- MG-GY 7173 Enterprise Data Systems *3 Credits*
- MG-GY 7503 Electronic Business Management *3 Credits*

Select Three:

Select three 3 credit courses of interest (for nine credits) with an "MG-GY" or "FRE-GY" or "IE-GY" or "MN-GY" prefix. FRE-GY courses may require pre-approval from the FRE Department. IE-GY and MN-GY courses may require pre-approval from the MS in IE and MS in MN Program Director. One optional minimum 3 credit MSM Restricted Concentration Elective is permitted as a course of interest selection.

Management (MSM), Entrepreneurship Concentration, M.S.

For further information, consult the [Master of Science in Management Program](#) page.

The MS Management Curriculum

1. Core Courses

The six required core courses shown below provide an 18 credit foundation upon which students can pursue cutting-edge specializations within the degree program. These core courses expose students to the disciplines required of a professional manager. Students who have taken these courses elsewhere or previously at the NYU Tandon School of Engineering, or who have had equivalent experience, may apply to substitute elective courses for such core courses; however, all students are required to complete the MSM degree's 36 credits.

- MG-GY 6013 Organizational Behavior *3 Credits*
- MG-GY 6073 Marketing *3 Credits*
- MG-GY 6083 Economics *3 Credits*
- MG-GY 6093 Accounting and Finance *3 Credits*
- MG-GY 6503 Management of Information Technology and Information Systems *3Credits*
- MG-GY 8673 Technology Strategy *3 Credits*

Note:

Core courses should be taken as early in the program as possible.

2. Areas of Concentration

Students must formally choose and declare a 15 credit area of concentration, which can be from among those listed below or, with the MSM Program Director's pre-approval, a set of courses that meet individual needs through a custom MSM concentration. A minimum of four courses must be selected in any one concentration area. Courses in all the available concentrations are shown below.

3. Capstone Project Course

This required, integrating three-credit course, MG-GY 9703 Project in Strategy and Innovation, is recommended for a student's final semester. In special cases, MG-GY 997X MS Thesis in Technology Management may be substituted for students wishing to produce a major dissertation in a specialty with the permission of the MSM Program Director and the TM&I Chair. Such a student must follow the Master's Thesis course requirements.

Concentration Course Requirements

Each MSM concentration sequence comprises a minimum of five courses totaling 15 credits. Substitutions may be made with the MSM Program Director's pre-approval in any concentration area.

Entrepreneurship

The Entrepreneurship Concentration is offered for the manager, professional or specialist interested in entrepreneurial management—as an entrepreneur starting a new business, as an “intrapreneur” in a large, established firm, or as a professional (e.g., venture capitalist) interested in playing a role in new enterprises. This concentration develops a valuable entrepreneurial state of mind for any business setting. Modern entrepreneurial concepts and cases are learned and applied.

Required:

- MG-GY 7703 Entrepreneurship 3 Credits
- MG-GY 8653 Managing Technological Change and Innovation 3 Credits

Select Two:

- MG-GY 7873 Managing Intellectual Property and Intellectual Capital 3 Credits
- MG-GY 8713 Entrepreneurial Finance 3 Credits
- MG-GY 8723 Managing Growing Enterprises 3 Credits
- MG-GY 8733 Corporate Entrepreneurship 3 Credits
- MG-GY 8743 Entrepreneurial Marketing and Sales 3 Credits

Select One:

Select one 3 credit course of interest with an “MG-GY” or “FRE-GY” or “IE-GY” or “MN-GY” prefix. FRE-GY courses may require pre-approval from the FRE Department. IE-GY and MN-GY courses may require pre-approval from the MS in IE and MS in MN Program Director. One optional minimum 3 credit MSM Restricted Concentration Elective is permitted as a course of interest selection.

Management (MSM), Human Resource Management Concentration, M.S.

For further information, consult the [Master of Science in Management Program](#) page.

The MS Management Curriculum

1. Core Courses

The six required core courses shown below provide an 18 credit foundation upon which students can pursue cutting-edge specializations within the degree program. These core courses expose students to the disciplines required of a professional manager. Students who have taken these courses elsewhere or previously at the NYU Tandon School of Engineering, or who have had equivalent experience, may apply to substitute elective courses for such core courses; however, all students are required to complete the MSM degree's 36 credits.

- MG-GY 6013 Organizational Behavior *3 Credits*
- MG-GY 6073 Marketing *3 Credits*
- MG-GY 6083 Economics *3 Credits*
- MG-GY 6093 Accounting and Finance *3 Credits*
- MG-GY 6503 Management of Information Technology and Information Systems *3Credits*
- MG-GY 8673 Technology Strategy *3 Credits*

Note:

Core courses should be taken as early in the program as possible.

2. Areas of Concentration

Students must formally choose and declare a 15 credit area of concentration, which can be from among those listed below or, with the MSM Program Director's pre-approval, a set of courses that meet individual needs through a custom MSM concentration. A minimum of four courses must be selected in any one concentration area. Courses in all the available concentrations are shown below.

3. Capstone Project Course

This required, integrating three-credit course, MG-GY 9703 Project in Strategy and Innovation, is recommended for a student's final semester. In special cases, MG-GY 997X MS Thesis in

Technology Management may be substituted for students wishing to produce a major dissertation in a specialty with the permission of the MSM Program Director and the TM&I Chair. Such a student must follow the Master's Thesis course requirements.

Concentration Course Requirements

Each MSM concentration sequence comprises a minimum of five courses totaling 15 credits. Substitutions may be made with the MSM Program Director's pre-approval in any concentration area.

Human Resource Management

The Concentration in Human Resource Management prepares professionals for today's technology-intensive environment. The program provides the knowledge and techniques to deal with human-resource issues and to achieve high-quality innovation and productivity in often-turbulent organizational settings. The changing nature of work and shifting professional expectations are explored.

Required:

- MG-GY 6123 Human Resource Management *3 Credits*

Choose One:

- MG-GY 6173 Performance Management and Reward Systems *3 Credits*
- MG-GY 6223 Staffing Systems in Organizations *3 Credits*

Select Three:

Select three 3-credit courses of interest (for nine credits) with an "MG-GY" or "FRE-GY" or "IE-GY" or "MN-GY" prefix. FRE-GY courses may require pre-approval from the FRE Department. IE-GY and MN-GY courses may require pre-approval from the MS in IE and MS in MN Program Director. One optional minimum 3 credit MSM Restricted Concentration Elective is permitted as a course of interest selection. However, it is recommended that students select courses from the Department of Technology Management & Innovation's MS in Organizational Behavior & Systems Analytics Program.

Management (MSM), Industrial and Manufacturing Engineering Concentration, M.S.

For further information, consult the [Master of Science in Management Program](#) page.

The MS Management Curriculum

1. Core Courses

The six required core courses shown below provide an 18 credit foundation upon which students can pursue cutting-edge specializations within the degree program. These core courses expose students to the disciplines required of a professional manager. Students who have taken these courses elsewhere or previously at the NYU Tandon School of Engineering, or who have had equivalent experience, may apply to substitute elective courses for such core courses; however, all students are required to complete the MSM degree's 36 credits.

- MG-GY 6013 Organizational Behavior 3 Credits
- MG-GY 6073 Marketing 3 Credits
- MG-GY 6083 Economics 3 Credits
- MG-GY 6093 Accounting and Finance 3 Credits
- MG-GY 6503 Management of Information Technology and Information Systems 3Credits
- MG-GY 8673 Technology Strategy 3 Credits

Note:

Core courses should be taken as early in the program as possible.

2. Areas of Concentration

Students must formally choose and declare a 15 credit area of concentration, which can be from among those listed below or, with the MSM Program Director's pre-approval, a set of courses that meet individual needs through a custom MSM concentration. A minimum of four courses must be selected in any one concentration area. Courses in all the available concentrations are shown below.

3. Capstone Project Course

This required, integrating three-credit course, MG-GY 9703 Project in Strategy and Innovation, is recommended for a student's final semester. In special cases, MG-GY 997X MS Thesis in Technology Management may be substituted for students wishing to produce a major dissertation in a specialty with the permission of the MSM Program Director and the TM&I Chair. Such a student must follow the Master's Thesis course requirements.

Concentration Course Requirements

Each MSM concentration sequence comprises a minimum of five courses totaling 15 credits. Substitutions may be made with the MSM Program Director's pre-approval in any concentration area.

Industrial and Manufacturing Engineering

This multi-disciplinary industrial engineering MSM Concentration is designed for students and professionals interested in pursuing management positions directly related to industrial and/or manufacturing environments. This concentration is coordinated jointly with the Industrial and Manufacturing Engineering and MSM Programs in the Technology Management and Innovation Department.

Required:

- MG-GY 8203 Project Management 3 Credits
or
- IE-GY 6203 Project Planning and Control (Project Management) 3 Credits
and
- IE-GY 7883 Manufacturing Systems Engineering 3 Credits
- IE-GY 7993 Supply Chain Engineering 3 Credits

Select Two:

- MG-GY 6103 Management Science 3 Credits
 - MG-GY 8643 New Product Development 3 Credits
 - MG-GY 9683 Internship and Action Learning 3 Credits **
 - MN-GY 7893 Production Science 3 Credits
 - MN-GY 7713 Product Realization Process 3 Credits
 - IE-GY 7923 Design for Manufacturability 3 Credits
 - IE-GY 7873 Lean Manufacturing 3 Credits
 - IE-GY 7653 Human Factors in Engineering Design Credits
 - IE-GY 6823 Factory Simulation 3 Credits
 - MN-GY 7503 Introduction to Target Costing—Customer Driven Product Design 3Credits
- **= Only with express written pre-approvals by both MSM and IE/MN Program Directors.

Management (MSM), Information Management and Telecommunications Management Concentration, M.S.

For further information, consult the [Master of Science in Management Program](#) page.

The MS Management Curriculum

1. Core Courses

The six required core courses shown below provide an 18 credit foundation upon which students can pursue cutting-edge specializations within the degree program. These core courses expose students to the disciplines required of a professional manager. Students who have taken these courses elsewhere or previously at the NYU Tandon School of Engineering, or who have had equivalent experience, may apply to substitute elective courses for such core courses; however, all students are required to complete the MSM degree's 36 credits.

- MG-GY 6013 Organizational Behavior *3 Credits*
- MG-GY 6073 Marketing *3 Credits*
- MG-GY 6083 Economics *3 Credits*
- MG-GY 6093 Accounting and Finance *3 Credits*
- MG-GY 6503 Management of Information Technology and Information Systems *3Credits*
- MG-GY 8673 Technology Strategy *3 Credits*

Note:

Core courses should be taken as early in the program as possible.

2. Areas of Concentration

Students must formally choose and declare a 15 credit area of concentration, which can be from among those listed below or, with the MSM Program Director's pre-approval, a set of courses that meet individual needs through a custom MSM concentration. A minimum of four courses must be selected in any one concentration area. Courses in all the available concentrations are shown below.

3. Capstone Project Course

This required, integrating three-credit course, MG-GY 9703 Project in Strategy and Innovation, is recommended for a student's final semester. In special cases, MG-GY 997X MS Thesis in Technology Management may be substituted for students wishing to produce a major dissertation in a specialty with the permission of the MSM Program Director and the TM&I Chair. Such a student must follow the Master's Thesis course requirements.

Concentration Course Requirements

Each MSM concentration sequence comprises a minimum of five courses totaling 15 credits. Substitutions may be made with the MSM Program Director's pre-approval in any concentration area.

Information Management and Telecommunications Management

The Concentration in Information Management and Telecommunications Management is for professionals in information technology (IT), telecom and networking, programmers, systems experts and others with IT-related career goals and experience. Students learn to understand how IT and networking enhance the effectiveness of modern firms and the ability to manage creative and professional people.

Required:

- MG-GY 6553 Telecommunications Management I 3 Credits
- MG-GY 7173 Enterprise Data Systems 3 Credits

Select Three:

Select three 3 credit courses of interest (for nine credits) with an "MG-GY" or "FRE-GY" or "IE-GY" or "MN-GY" prefix. FRE-GY courses may require pre-approval from the FRE Department. IE-GY and MN-GY courses may require pre-approval from the MS in IE and MS in MN Program Director. One optional minimum 3 credit MSM Restricted Concentration Elective is permitted as a course of interest selection.

Management (MSM), M.S.

Academic and Administrative Director: [Bohdan Hoshovsky](#)

Introduction

The Department of Technology Management and Innovation at NYU Tandon School of Engineering is the New York City/Tri-State region's academic hub for technology and innovation management.

The Master of Science in Management degree (MSM) is recognized by the Graduate Management Admission Council as a graduate professional-management degree. NYU Tandon School of Engineering's modern MSM curriculum prepares working and aspiring professionals for increasing knowledge and responsibility in management in technology-intensive settings and entrepreneurial venues. Unlike longer and more general management programs elsewhere, the MSM is structured so that students, without losing needed breadth, can more quickly concentrate on their specialized areas of interest—all within the larger technology and innovation management domain. In short, the MSM represents an efficient, focused, up-to-date and unique professional learning experience.

The program has been thoroughly designed to develop competencies in modern decision making and to select, allocate and direct human, financial, physical, technological and organizational resources during rapid, technology-driven change. These management skills can be applied in a broad range of professional settings in the private and public sectors, in production and service-oriented activities, and in traditional and high-technology environments.

The MSM program in management takes a pragmatic, modern, results-oriented approach that emphasizes integrating technology, people and advanced managerial approaches to create value in the marketplace and in modern organizations. Unlike a traditional MBA, the MSM possesses an efficiently designed curriculum, wherein students specialize quickly. Even subjects such as finance and marketing are taught not as special areas of expertise, but as basic tools for managerial decision making in a technology-intensive and knowledge-based environment. NYU Tandon School of Engineering supports these courses with a modern, Web-based infrastructure. The program continually introduces state-of-the-art material in paper and digital format. MSM graduates are ready to advance swiftly in a competitive business world.

The department tailors class schedules and teaching to the specific needs of its students, many of whom are working professionals or engaged at internships. Classes are typically offered after regular office hours. Class structure enables participants to receive individual attention and to work closely with faculty. The course of study is for those aspiring to work in, or currently working in, technology-intensive industries and in companies that depend on technology and innovation for products and services.

Overview of the MS in Management (MSM) Curriculum

1. Core MSM Courses

The six required core courses shown below provide an 18 credit foundation upon which students can pursue cutting edge specializations within the degree program. These core courses expose students to the disciplines required of a professional manager. Students who have taken these courses

elsewhere or previously at the NYU Tandon School of Engineering, or who have had equivalent experience, may apply to substitute elective courses for such core courses; however, all students are required to complete the MSM degree's 36 credits.

- MG-GY 6013 Organizational Behavior
- MG-GY 6073 Marketing
- MG-GY 6083 Economics
- MG-GY 6093 Accounting and Finance
- MG-GY 6503 Management of Information Technology and Information Systems
- MG-GY 8673 Technology Strategy

Core courses should be taken as early in the program as possible.

2. Areas of Concentration

After completing the core courses, MSM degree candidates build further managerial skills by formally choosing and declaring from the following 15 credit area of MSM Concentrations, all of which are designed for success in a global economy in which on-going innovation is required. (With the MSM Program Director's pre-approval, a set of courses that meet individual needs through a custom MSM concentration may be chosen). A minimum of four courses must be selected in any one concentration area. MSM concentrations include:

- Management (MSM), Entrepreneurship Concentration, M.S.
- Management (MSM), Electronic Business Concentration, M.S.
- Management (MSM), Project Management Concentration, M.S.
- Management (MSM), Technology Management Concentration, M.S.
- Management (MSM), Information Management and Telecommunications Management Concentration, M.S.
- Management (MSM), Human Resource Management Concentration, M.S.
- Management (MSM), Construction Management Concentration, M.S.
- Management (MSM), Industrial and Manufacturing Engineering Concentration, M.S.
- Management (MSM), Design Innovation Concentration, M.S.
- Custom Concentration (only with preapproval of the MSM Program Director)

MSM students are permitted to choose one optional **MSM Restricted Concentration Elective** in their MSM Concentration course-of-interest selection as per the following guidelines: An MSM Restricted Concentration Elective is defined as any graduate management course of at least 3.0 credits from any NYU School. The student's Restricted Concentration Elective course selection requires written pre-approval of the MSM Program Director.

3. Capstone Project Course

The MSM program concludes with an overarching capstone project course. The required, integrating three-credit course, MG-GY 9703 Project in Strategy and Innovation, is recommended for a student's final semester. In special cases, MG-GY 997X MS Thesis in Technology Management may be substituted for students wishing to produce a major dissertation in a specialty with the permission of the MSM Program Director and the TM&I Chair. Such a student must follow the Master's Thesis course requirements.

Goals and Objectives

The goal of the Master of Science in Management is to provide the highest quality and most effectively designed learning experience that centers broadly on modern managerial arenas encompassing innovation, technology and information management, e-business and entrepreneurship in the New York City/Tri-State Region and beyond.

We encourage NYU Tandon School of Engineering graduate students to broaden their knowledge through our technology management and innovation course offerings. The MSM Program espouses a synergistic approach with several NYU Tandon School of Engineering Graduate degree programs outside of TM&I, which have incorporated MSM courses in their curricula.

Admission and Degree Requirements

Criteria for admission include a bachelor's degree with at least a B average from an accredited college or university and demonstrated evidence of motivation, maturity, and the ability to benefit from and contribute to professional graduate studies. Students must exhibit a strong desire to make a difference in fields associated with innovation, technology and modern change. Satisfactory scores on the Graduate Record Examination (GRE) or an acceptable equivalent test, such as the Graduate Management Admission Test (GMAT), is required to support admission.

The MSM requires completion of 12 courses, as described above in the MSM curriculum, for 36 credits with a B average or better. A maximum of nine transfer credits may be granted for graduate courses taken elsewhere prior to enrollment in MSM after they are evaluated by the MSM Program Director.

Notes:

The MSM program requires some fundamental knowledge of probability and statistics. Students without such a background are required to take a managerial probability and statistics course such as MA-UY 2054, MG-GY 5050, or its equivalent. Students with this background may apply to waive this requirement.

Undergraduates in Graduate MSM Classes

With three exceptions, undergraduates may not enroll in graduate MSM classes. The exceptions are: (1) undergraduate students enrolled in a joint BS-MS program associated with the Technology Management and Innovation Department, with the approval of an adviser in the Technology Management Department, may register for Graduate Management courses; (2) undergraduate seniors with a 3.0 GPA or better, with the signature of the MSM program director, may register for MSM core courses: MG-GY 6013, MG-GY 6073, MG-GY 6083, MG-GY 6093, MG-GY 6503 and MG-GY 8673; and (3) undergraduate seniors majoring in BTM with a 3.0 GPA or better, with the signature of the MSM program director, may register for any MSM course.

Advanced Certificate Programs

The Department of Technology Management and Innovation offers an advanced certificate program for professionals with work experience. Applicants for the advanced certificate program must hold bachelor's degrees. Matriculation in the advanced certificate program requires formal application and acceptance to one of the Advanced Certificate Programs. The Advanced Certificate Program

described here is comprised of five courses (totaling 15 credits) that meet individual needs and meet the certificate's requirements, as indicated below.

Students are issued a certificate after they complete a sequence with an average grade of B or better. Those who choose to apply for a Master of Science in Management are able, upon admission, to apply 9 credits completed for a certificate toward fulfillment of the graduate degree requirements. Additional information can be obtained from the TM&I department.

An Advanced Technology Management Certificate is offered in the following field:

- Project Management (Online) Advanced Certificate

Management (MSM), Project Management Concentration, M.S.

For further information, consult the [Master of Science in Management Program](#) page.

The MS Management Curriculum

1. Core Courses

The six required core courses shown below provide an 18 credit foundation upon which students can pursue cutting-edge specializations within the degree program. These core courses expose students to the disciplines required of a professional manager. Students who have taken these courses elsewhere or previously at the NYU Tandon School of Engineering, or who have had equivalent experience, may apply to substitute elective courses for such core courses; however, all students are required to complete the MSM degree's 36 credits.

- MG-GY 6013 Organizational Behavior *3 Credits*
- MG-GY 6073 Marketing *3 Credits*
- MG-GY 6083 Economics *3 Credits*
- MG-GY 6093 Accounting and Finance *3 Credits*
- MG-GY 6503 Management of Information Technology and Information Systems *3Credits*
- MG-GY 8673 Technology Strategy *3 Credits*

Note:

Core courses should be taken as early in the program as possible.

2. Areas of Concentration

Students must formally choose and declare a 15 credit area of concentration, which can be from among those listed below or, with the MSM Program Director's pre-approval, a set of courses that meet individual needs through a custom MSM concentration. A minimum of four courses must be selected in any one concentration area. Courses in all the available concentrations are shown below.

3. Capstone Project Course

This required, integrating three-credit course, MG-GY 9703 Project in Strategy and Innovation, is recommended for a student's final semester. In special cases, MG-GY 997X MS Thesis in Technology Management may be substituted for students wishing to produce a major dissertation in a specialty with the permission of the MSM Program Director and the TM&I Chair. Such a student must follow the Master's Thesis course requirements.

Concentration Course Requirements

Each MSM concentration sequence comprises a minimum of five courses totaling 15 credits. Substitutions may be made with the MSM Program Director's pre-approval in any concentration area.

Project Management

The Concentration in Project Management is for managers who manage, finance or facilitate projects in modern enterprises. This concentration provides managers with the latest managerial knowledge and methods to manage an array of projects effectively.

Required:

- MG-GY 6303 Operations Management 3 Credits
- MG-GY 8203 Project Management 3 Credits

Select Three:

Select three 3 credit courses of interest (for nine credits) with an "MG-GY" or "FRE-GY" or "IE-GY" or "MN-GY" prefix. FRE-GY courses may require pre-approval from the FRE Department. IE-GY and MN-GY courses may require pre-approval from the MS in IE and MS in MN Program Director. One optional minimum 3 credit MSM Restricted Concentration Elective is permitted as a course of interest selection.

Management (MSM), Technology Management Concentration, M.S.

For further information, consult the [Master of Science in Management Program](#) page.

The MS Management Curriculum

1. Core Courses

The six required core courses shown below provide an 18 credit foundation upon which students can pursue cutting-edge specializations within the degree program. These core courses expose students to the disciplines required of a professional manager. Students who have taken these courses elsewhere or previously at the NYU Tandon School of Engineering, or who have had equivalent experience, may apply to substitute elective courses for such core courses; however, all students are required to complete the MSM degree's 36 credits.

- MG-GY 6013 Organizational Behavior *3 Credits*
- MG-GY 6073 Marketing *3 Credits*
- MG-GY 6083 Economics *3 Credits*
- MG-GY 6093 Accounting and Finance *3 Credits*
- MG-GY 6503 Management of Information Technology and Information Systems *3Credits*
- MG-GY 8673 Technology Strategy *3 Credits*

Note:

Core courses should be taken as early in the program as possible.

2. Areas of Concentration

Students must formally choose and declare a 15 credit area of concentration, which can be from among those listed below or, with the MSM Program Director's pre-approval, a set of courses that meet individual needs through a custom MSM concentration. A minimum of four courses must be selected in any one concentration area. Courses in all the available concentrations are shown below.

3. Capstone Project Course

This required, integrating three-credit course, MG-GY 9703 Project in Strategy and Innovation, is recommended for a student's final semester. In special cases, MG-GY 997X MS Thesis in

Technology Management may be substituted for students wishing to produce a major dissertation in a specialty with the permission of the MSM Program Director and the TM&I Chair. Such a student must follow the Master's Thesis course requirements.

Concentration Course Requirements

Each MSM concentration sequence comprises a minimum of five courses totaling 15 credits. Substitutions may be made with the MSM Program Director's pre-approval in any concentration area.

Technology Management

The Technology Management Concentration is for managers, engineers and other professionals in technology-intensive environments and for those involved with technology-intensive products, processes or services. The program provides the modern methods and concepts necessary to make strategic technology-investment decisions; to understand technology and innovation strategy, product-life cycles and competitive factors; and to develop special skills need to manage creative people and professionals.

Required:

-
- MG-GY 8203 Project Management 3 *Credits*
 - MG-GY 8653 Managing Technological Change and Innovation 3 *Credits*

Select Three:

Select three 3 credit courses of interest (for nine credits) with an "MG-GY" or "FRE-GY" or "IE-GY" or "MN-GY" prefix. FRE-GY courses may require pre-approval from the FRE Department. IE-GY and MN-GY courses may require pre-approval from the MS in IE and MS in MN Program Director. One optional minimum 3 credit MSM Restricted Concentration Elective is permitted as a course of interest selection.

Management of Technology (Online)

If you are looking to make a difference in the new digital economy, where bridging the gap between management and technology is crucial, you should enroll in NYU School of Engineering's online Master's in Management of Technology (MOT). If you are a mid-career manager or member of a technical staff, the program is technology based and industry-driven, allowing you to create and deliver value to your organization.

MOT is your unique path to management, leadership, innovation, entrepreneurship, design thinking, and creativity for 21st century leaders. Encompassing a broad range of industry sectors, the degree is your fast track to high-tech leadership. It also features IBM-requested course electives, focusing on communication and design of technology.

Core Courses (27 Credits)

Mandatory Core Courses (18 Credits)

- MG-GY 6013 Organizational Behavior 3 Credits
- MG-GY 6073 Marketing 3 Credits
- MG-GY 6083 Economics 3 Credits
- MG-GY 6093 Accounting and Finance 3 Credits
- MG-GY 7953 Global Innovation 3 Credits
- MG-GY 8653 Managing Technological Change and Innovation 3 Credits

Tech Management Tools (9 Credits)

Choose any three courses:

- MG-GY 6933 Information Technologies, Systems and Management in Organizations 3Credits
- MG-GY 8203 Project Management 3 Credits
- MG-GY 9753 Selected Topics in Management 3 Credits

Elective Courses (6 Credits)

Any MG-GY graduate level course offered at the NYU Tandon School of Engineering.

Capstone Experience (3 Credits)

You must complete one of the following:

- MG-GY 9503 eMOT Capstone Project Course *3 Credits*
- MG-GY 9703 Project in Strategy and Innovation *3 Credits*
- MG-GY 9753 Selected Topics in Management *3 Credits*
- MG-GY 997X MS Thesis in Technology Management *3 Credits*

Management of Technology, M.S.

Program Description and Purpose

Effective use of technology, leadership, innovation practice and management and entrepreneurship increasingly determine success in business. The Department of Technology Management and Innovation is an acknowledged pioneer and leader in the New York City/tri-state region and beyond in offering courses and programs about these increasingly critical arenas. The department serves a diverse and broad range of professionals, and its faculty and students compose a vital and forward-thinking research and learning community. The department's research and educational offerings focus on a broad range of industry sectors, including financial and professional services; information technology, renewable energy and clean technology as well as non-profits and government-all constituting areas of greatest growth and opportunity in the modern economy, especially in New York City, the nation's foremost global city.

The NYU Polytechnic School of Engineering Master's Degree Program in Management of Technology (MOT) was created for professionals who aim to make a difference in an economy where connecting the technology and business worlds is crucial. It introduces participants to the latest thinking and best practices in technology management and innovation. For forward-thinking managers, the MOT Program is a proven and unique path to leadership, innovation, entrepreneurship, design thinking, and creativity in the Twenty-First Century.

The department also offers the MOT program in an Executive format with classes held on a biweekly basis. This eMOT format focuses on students with more professional experience. It is characterized by having cohort groups that focus on improving teamwork and facilitating student networking with technology managers in the New York City/tri-state region.

Program Structure and Curriculum

The MOT Program comprises 12 courses (see listing below) totaling 36 credits. Courses for the MOT program are held on weekday evenings and on Saturdays at 55 Broad Street in Lower Manhattan and on weekday evenings at the Brooklyn campus of the School of Engineering. Fulltime students may complete this MS program in 10 calendar months by completing 4 courses per semester for 3 semesters, or in 15 calendar months by completing 3 courses per semester for 4 semesters. Part-time students may take from one to two courses per semester, completing the program in 22 to 44 calendar months. Participants who complete the MOT Program receive a Master of Science degree in Management of Technology.

For the most current information: www.mot.poly.edu

For additional descriptive information: [Downloadable brochure](#)

The MOT program's series of required courses provide participants with a deep understanding of the foundations of managerial competencies needed to manage innovation in the evolving business

environment. In addition, participants can choose electives from the Department of Technology Management and Innovation or from other areas of the School that can enhance their understanding of a particular area of interest in the broadly defined arena of technology management.

Courses

The MS MOT 36-credit curriculum consists of 12 three-credit courses:

- Management Core courses (15 credits)
- Technology and Innovation Core (15 credits)
- Elective courses (6 credits)

MS MOT Executive format students may, with written permission from the MOT Program Director, replace the required courses in Operations Management and/or Project Management with any approved elective.

Required Courses (30 Credits)

Management Core (15 Credits)

- MG-GY 6013 Organizational Behavior 3 Credits
 - MG-GY 6073 Marketing 3 Credits
 - MG-GY 6093 Accounting and Finance 3 Credits
 - MG-GY 6083 Economics 3 Credits
- and
- MG-GY 6703 Operations Management for knowledge-Based Enterprises 3 Credits
- or
- MG-GY 6303 Operations Management

Technology and Innovation Core (15 Credits)

- MG-GY 6503 Management of Information Technology and Information Systems 3 Credits
- or
- MG-GY 6933 Information Technologies, Systems and Management in Organizations 3 Credits
- and
- MG-GY 7953 Global Innovation 3 Credits
 - MG-GY 8203 Project Management 3 Credits
 - MG-GY 8653 Managing Technological Change and Innovation 3 Credits
- and

- MG-GY 9503 eMOT Capstone Project Course *3 Credits*
or
MG-GY 9703 Project in Strategy and Innovation *3 Credits*
or
MG-GY 997X MS Thesis in Technology Management *3 Credits*

Elective Courses (6 Credits)

With the MOT Program Director's permission, MOT students may choose any elective 3.0 credit graduate courses offered by the Department of Technology Management and Innovation, or any 3.0 credit graduate course offered by any other NYU School of Engineering department.

List of Possible Elective Courses:

- MG-GY 6043 Innovation Management in Money, Banking and Financial Markets *3Credits*
- MG-GY 6153 Leadership Development and Team Building *3 Credits*
- MG-GY 7703 Entrepreneurship *3 Credits*
- MG-GY 7733 Services Innovation *3 Credits*
- MG-GY 7743 Advanced Trends in Technology Management and Innovation *3 Credits*
- MG-GY 7963 Modern Financial Institutions and Their Competitive Environment *3Credits*
- MG-GY 7983 Managing Technological Innovation and Emerging Technologies in Financial Services *3 Credits*
- MG-GY 8573 Managing Cleantech and Renewable Energy Innovation *3 Credits*
- MG-GY 8783 Managing Cloud Computing *3 Credits*
- MG-GY 9683 Internship and Action Learning *3 Credits*
- MG-GY 9753 Selected Topics in Management *3 Credits*

Sample Curriculum

First Semester

- MG-GY 6013 Organizational Behavior *3 Credits*
- MG-GY 6093 Accounting and Finance *3 Credits*
- MG-GY 8653 Managing Technological Change and Innovation *3 Credits*

Second Semester

- MG-GY 6083 Economics *3 Credits*
- MG-GY 6933 Information Technologies, Systems and Management in Organizations *3Credits*
- MG-GY 6303 Operations Management *3 Credits*

Third Semester

- MG-GY 6073 Marketing 3 *Credits*
- Elective
- Elective

Fourth Semester

- MG-GY 7953 Global Innovation 3 *Credits*
- MG-GY 9503 eMOT Capstone Project Course 3 *Credits*
- MG-GY 8203 Project Management 3 *Credits* or Elective

Manufacturing Engineering, M.S.

Graduate Program

The Master of Science in Manufacturing Engineering can be taken full time or part time. Students are drawn from a wide variety of manufacturing firms, large and small. This program:

- Enables graduates to identify, evaluate and implement production improvements by applying new methods;
- Provides experience in design and production through internships and projects;
- Provides hands-on experience in using software for design and simulation;
- Equips program graduates with a working knowledge of advanced methods and techniques used worldwide in manufacturing;
- Provides graduates with sufficient knowledge and hands-on experience to contribute significantly to productivity improvement and to provide the leadership required, thereby positioning them to advance their careers.

Desirable Backgrounds for Graduate Students

Admission to this graduate program is open to those holding an accredited engineering degree (BS or BE), to graduates in physics, chemistry, materials science and the biological sciences, and to those holding an MBA. International students with equivalent backgrounds are eligible for the program.

Requirements for the Master of Science

The degree program requires 30 credits, 9 of which may be granted for up to three relevant graduate-level courses completed elsewhere with a grade of B or better. Issues relating to the transfer of courses are at the discretion of the Program Director.

Manufacturing Engineering Program

Prerequisite Courses (or equivalent knowledge)

- Computer literacy
- Knowledge of engineering economics
- Understanding of probability and statistics

Students lacking the relevant knowledge must complete additional courses to satisfy these prerequisites.

Required Core Courses: 12 Credits

- MN-GY 7893 Production Science 3 Credits

- MN-GY 6113 Quality Control and Improvement *3 Credits*
- MN-GY 7923 Design for Manufacturability *3 Credits*
- MN-GY 7993 Supply Chain Engineering *3 Credits*

Other Courses: 18 Credits

Students are required to take three electives from Manufacturing or Industrial Engineering for a total of 9 credits.

The following courses can be used to fulfill the elective requirements for the Masters in Manufacturing (MN) engineering. Students can also elect to take an additional three courses/nine credits outside of the MN/IE curriculum with the approval of their academic advisor.

- MG-GY 6303 Operations Management *3 Credits*
- MG-GY 6343 Human Capital Engineering & Analytics *3 Credits*
- MG-GY 6361 Managing Business Process Reengineering *1.5 Credits*
- MG-GY 6293 Managing Technical Professionals *3 Credits*
- MG-GY 6353 Quality Management *3 Credits*
- MG-GY 6463 Supply Chain Management *3 Credits*
- MG-GY 8573 Managing Cleantech and Renewable Energy Innovation *3 Credits*
- MG-GY 8643 New Product Development *3 Credits*
- MG-GY 8653 Managing Technological Change and Innovation *3 Credits*

Total: 30 Credits

Students are encouraged to organize their electives into “concentrations.” These concentrations satisfy the needs of students’ careers and, for those who are working, the needs of the firm.

Master's Report

MN-GY 9963 MS Report I is normally 3 credits and may be expanded to 6 credits by using MN-GY 9973 as an elective. The master’s report is done in an industrial lab setting whenever possible. Local industries with plants accessible to campus offer internships in many types of manufacturing.

Part-time students may draw upon their work to provide pertinent master’s reports. Full-time students also may work on theoretical or experimental research projects at Polytechnic. In all cases, a faculty adviser is assigned. Written project proposals are required at the start of the work. A written summary and report are required upon completion of the project.

Mathematics, Examination Option and Designated Subspecialty Option, M.S.

Requirements for the Master of Science

A Bachelor's Degree in Mathematics is required for admission to this program. Students with degrees in other fields may possibly be admitted, with undergraduate deficiencies, at the discretion of departmental advisers. Before beginning graduate studies, students are expected to have completed a one-year course in advanced calculus.

Thirty credits are required. Six credits may be devoted to a thesis.

Required (core) courses, 12 credits, 3 credits each:

- MA-GY 7033 Linear Algebra I 3 Credits
- MA-GY 7043 Linear Algebra II 3 Credits
- MA-GY 6213 Elements of Real Analysis I 3 Credits
- MA-GY 6223 Elements of Real Analysis II 3 Credits

By Examination Option + Designated Sub-specialty Option:

Elective: 18 credits. At least 9 credits in courses approved for specialization by Department.

Note:

Includes a comprehensive oral examination before the degree is awarded. Examinations cover the student's program of study and are scheduled towards the end of the semester in which the work is completed.

Total: 30 Credits

Mathematics, Examination Option, M.S.

Requirements for the Master of Science

A Bachelor's Degree in Mathematics is required for admission to this program. Students with degrees in other fields may possibly be admitted, with undergraduate deficiencies, at the discretion of departmental advisers. Before beginning graduate studies, students are expected to have completed a one-year course in advanced calculus.

Thirty credits are required. Six credits may be devoted to a thesis.

Required (core) courses, 12 credits, 3 credits each:

- MA-GY 7033 Linear Algebra I 3 Credits
- MA-GY 7043 Linear Algebra II 3 Credits
- MA-GY 6213 Elements of Real Analysis I 3 Credits
- MA-GY 6223 Elements of Real Analysis II 3 Credits

Electives:

18 credits, possibly with up to 9 from approved subspecialties in other departments.

Note:

Includes a comprehensive oral examination before the degree is awarded. Examinations cover the student's program of study and are scheduled towards the end of the semester in which the work is completed.

Total: 30 Credits

Mathematics, Thesis Option, M.S.

Requirements for the Master of Science

A Bachelor's Degree in Mathematics is required for admission to this program. Students with degrees in other fields may possibly be admitted, with undergraduate deficiencies, at the discretion of departmental advisers. Before beginning graduate studies, students are expected to have completed a one-year course in advanced calculus.

Thirty credits are required. Six credits may be devoted to a thesis.

Required (core) courses, 12 credits, 3 credits each:

- MA-GY 7033 Linear Algebra I 3 Credits
- MA-GY 7043 Linear Algebra II 3 Credits
- MA-GY 6213 Elements of Real Analysis I 3 Credits
- MA-GY 6223 Elements of Real Analysis II 3 Credits

Thesis Option:

Electives: *12 credits*

Master's Thesis: *6 credits*

Note:

Requires an examination of the thesis material by faculty advisers and certification that the work is satisfactory.

Total: 30 Credits

Mechanical Engineering, Controls and Dynamic Systems Specialty, M.S.

Requirements for the Master of Science

Course requirements for the MS in Mechanical Engineering are suited to the applicant's specialty, which is specified by the student in the admissions process or during the first advising session. Students must take at least 21 credits out of the 30 credits needed for the degree at the NYU Tandon School of Engineering. No more than 6 credits in "Guided Reading" courses are allowed. Validation credit is not allowed, but the graduate adviser may waive specific requirements (and substitute designated ones), based upon the student's prior studies or experience. Transfer credits are not granted for:

- undergraduate courses;
- courses counted toward satisfying undergraduate degree requirements;
- courses not related to the graduate program as stated in this catalog;
- courses that received a grade lower than B.

The degree requirements are:

- ME-GY 6003 Applied Mathematics in Mechanical Engineering *3 Credits*
- ME-GY 6043 Thermal Engineering Fundamentals *3 Credits*
- ME-GY 6213 Introduction to Solid Mechanics *3 Credits*
- ME-GY 6603 Digital Control Systems *3 Credits*
- or
- ME-GY 6703 Linear Control Theory and Design I *3 Credits*
- ME xxxx Required for Specialty Area (see below) *6 Credits*
- ME xxxx Electives, approved by graduate adviser *6 Credits*
- Free Electives *6 Credits*

Total: 30 Credits

Note:

If students decide to do a ME 997x Master Thesis (9 credits) as part of their work for the degree, these 9 credits will be counted against 3 credits out of the 6 credits in ME electives, 3 credits out of the 6 credits in ME Required for the Specialty Area credits and 3 credits out of the 6 credits of Free Electives. Students are not allowed to submit more than three courses (9 credits) starting with a 5 for MS degree requirements satisfaction. Departmental electives include courses with a mechanical

(ME), aerospace (AE) or materials (MT) prefix, plus departmental thesis or project credits. All courses and program details are subject to adviser approval.

Controls and Dynamic Systems Specialty

In the Controls and Dynamic Systems area, at least three graduate courses come from the list of courses under this heading. See courses below.

Required Courses

3 courses from

- ME-GY 5643 Mechatronics *3 Credits*
- ME-GY 5653 Microelectromechanical Systems *3 Credits*
- ME-GY 6603 Digital Control Systems *3 Credits*
- ME-GY 6613 Sensor Based Robotics *3 Credits*
- ME-GY 6703 Linear Control Theory and Design I *3 Credits*
- ME-GY 6713 Linear Control Theory and Design II *3 Credits*
- ME-GY 7613 Nonlinear Systems: Analysis and Control *3 Credits*
- ME-GY 7623 Cooperative Control *3 Credits*
- ME-GY 7703 Optimal Robust Control *3 Credits*

Contact Information:

Departmental Adviser: Iskender Sahin

iskender.sahin@nyu.edu

Please note that the adviser (or lead faculty in specializations) also has some latitude for approving specialty courses.

Mechanical Engineering, Energy Engineering and Policy, M.S.

Requirements for the Master of Science

Course requirements for the MS in Mechanical Engineering are suited to the applicant's specialty, which is specified by the student in the admissions process or during the first advising session. Students must take at least 21 credits out of the 30 credits needed for the degree at the NYU Tandon School of Engineering. No more than 6 credits in "Guided Reading" courses are allowed. Validation credit is not allowed, but the graduate adviser may waive specific requirements (and substitute designated ones), based upon the student's prior studies or experience. Transfer credits are not granted for:

- undergraduate courses;
- courses counted toward satisfying undergraduate degree requirements;
- courses not related to the graduate program as stated in this catalog;
- courses that received a grade lower than B.

The degree requirements are:

- ME-GY 6003 Applied Mathematics in Mechanical Engineering *3 Credits*
 - ME-GY 6043 Thermal Engineering Fundamentals *3 Credits*
 - ME-GY 6213 Introduction to Solid Mechanics *3 Credits*
 - ME-GY 6603 Digital Control Systems *3 Credits*
- OR**
- ME-GY 6703 Linear Control Theory and Design I *3 Credits*
 - ME xxxx Required for Specialty Area (see below) *9 Credits*
 - ME xxxx Electives, approved by graduate adviser *6 Credits*
 - Free Elective *3 Credits*

Total: 30 Credits

Note:

If students decide to do a ME-GY 997X MS Thesis (9 credits) as part of their work for the degree, these 9 credits will be counted against 6 credits out of the 6 credits in ME Required for the Specialty Area credits and 3 credits out of the 3 credits of Free Electives. Students are not allowed to submit more than three courses (9 credits) starting with a 5 for MS degree requirements satisfaction. All courses and program details are subject to adviser approval.

Energy Engineering and Policy Specialty

Additional Required Energy Courses

- ME-GY 6813 Energy Conversion Systems *3 Credits*
- ME-GY 6823 Energy Policy, Regulations, and Incentives *3 Credits*
- ME-GY 6833 Energy Project Financing *3 Credits*

Additional Electives

Two Energy Related Electives (6 Credits) from

- ME-GY 7063 Convective Heat Transfer *3 Credits*
- ME-GY 7083 Radiative Heat Transfer *3 Credits*
- ME-GY 6153 Thermodynamics of HVAC Systems *3 Credits*
- ME-GY 6163 Fluid Mechanics for HVAC Systems *3 Credits*
- ME-GY 6173 Heat Transfer for HVAC Systems *3 Credits*
- ME-GY 6183 Design of HVAC Systems *3 Credits*
- Other electives per Advisor's approval *3 Credits*

Free Elective (3 Credits)

Contact Information:

Departmental Adviser: Iskender Sahin

iskender.sahin@nyu.edu

Please note that the adviser (or lead faculty in specializations) also has some latitude for approving specialty courses.

Mechanical Engineering, Mechanics and Structural Systems Specialty, M.S.

Requirements for the Master of Science

Course requirements for the MS in Mechanical Engineering are suited to the applicant's specialty, which is specified by the student in the admissions process or during the first advising session. Students must take at least 21 credits out of the 30 credits needed for the degree at the NYU Tandon School of Engineering. No more than 6 credits in "Guided Reading" courses are allowed. Validation credit is not allowed, but the graduate adviser may waive specific requirements (and substitute designated ones), based upon the student's prior studies or experience. Transfer credits are not granted for:

- undergraduate courses;
- courses counted toward satisfying undergraduate degree requirements;
- courses not related to the graduate program as stated in this catalog;
- courses that received a grade lower than B.

The degree requirements are:

- ME-GY 6003 Applied Mathematics in Mechanical Engineering *3 Credits*
- ME-GY 6043 Thermal Engineering Fundamentals *3 Credits*
- ME-GY 6213 Introduction to Solid Mechanics *3 Credits*
- ME-GY 6603 Digital Control Systems *3 Credits*
- or
- ME-GY 6703 Linear Control Theory and Design I *3 Credits*
- ME xxxx Required for Specialty Area (see below) *6 Credits*
- ME xxxx Electives, approved by graduate adviser *6 Credits*
- Free Electives *6 Credits*

Total: 30 Credits

Note:

If students decide to do a ME 997x Master Thesis (9 credits) as part of their work for the degree, these 9 credits will be counted against 3 credits out of the 6 credits in ME electives, 3 credits out of the 6 credits in ME Required for the Specialty Area credits and 3 credits out of the 6 credits of Free Electives. Students are not allowed to submit more than three courses (9 credits) starting with a 5 for MS degree requirements satisfaction. Departmental electives include courses with a mechanical

(ME), aerospace (AE) or materials (MT) prefix, plus departmental thesis or project credits. All courses and program details are subject to adviser approval.

Mechanics and Structural Systems Specialty

In the Mechanics and Structural Systems area, at least three graduate courses come from the list of courses under this heading. See courses below.

- ME-GY 5243 Composite Materials 3 Credits
- ME-GY 5443 Vibrations 3 Credits
- ME-GY 6213 Introduction to Solid Mechanics 3 Credits
- ME-GY 6223 Advanced Mechanics of Materials 3 Credits
- ME-GY 6253 Mechanics of Nanomaterials 3 Credits
- ME-GY 6513 Advanced Dynamics 3 Credits
- ME-GY 7213 Elasticity I 3 Credits
- ME-GY 7243 Advanced Composite Materials 3 Credits
- ME-GY 7323 Failure Mechanics 3 Credits
- ME-GY 7333 Non-Destructive Evaluation (NDE) 3 Credits
- ME-GY 7353 Fracture Mechanics 3 Credits
- ME-GY 7443 Advanced Vibrations 3 Credits
- ME-GY 8213 Elasticity II 3 Credits
- ME-GY 8273 Mechanics of Cellular Materials 3 Credits

Contact Information:

Departmental Adviser: Iskender Sahin

iskender.sahin@nyu.edu

Please note that the adviser (or lead faculty in specializations) also has some latitude for approving specialty courses.

Mechatronics and Robotics, M.S.

Requirements for the Master of Science

To complete this M.S. degree, 30 credits as specified below must be completed.

- four 3 credit core courses that will introduce students to fundamental elements of modeling, hardware, and software relevant to mechatronics and robotics
- one 3 credit course will introduce students to fundamentals of entrepreneurship and innovation to enable them to link their technical education with potential to launch businesses
- two 3 credit project courses will allow students to acquire hands-on learning and experience in integrating their coursework to create concrete illustrations of mechatronics and robotic devices (alternatively, 6 credit thesis research)
- to specialize in a focused area of mechatronics and robotics, students will select up to two 3 credit courses from a list of elective courses
- one 3 credit free elective course with advisor approval

Core Mechatronics and Robotics Courses

Students must complete all four Mechatronics and Robotics core courses.

- ME-GY 5913 Mechatronics *Credits*
- ME-GY 6913 Introduction to Robot Mechanics *3 Credits*
- ME-GY 6923 Simulation Tools for Robotics *3 Credits*
- ME-GY 6933 Advanced Mechatronics *3 Credits*

Entrepreneurship and Innovation Course

Students may select from the following courses:

- MG-GY 7703 Entrepreneurship *3 Credits*
- MG-GY 7743 Advanced Trends in Technology Management and Innovation *3 Credits*
- MG-GY 7861 High-technology Entrepreneurship *1.5 Credits*
- MG-GY 7871 Intellectual Property for Technology and Information Managers *1.5Credits*
- MG-GY 8653 Managing Technological Change and Innovation *3 Credits*

Project Courses

Students must complete either two 3-credit project courses or they can enroll in one 6-credit thesis course.

Electives

Students must complete two elective courses from the list below to develop specializations.

Assistive Mechatronic and Robotic Technologies

- ME-GY 7913 Robots for Disability *3 Credits*
- ME-GY 7923 Robotic Gait and Manipulation *3 Credits*

Mobile Robotics

- ME-GY 7933 Fundamentals of Robot Mobility *3 Credits*
- ME-GY 7943 Networked Robotics Systems, Cooperative Control and Swarming *3Credits*

Microrobotics

- ME-GY 7953 Introduction to Smart Materials and Structures *3 Credits*
- ME-GY 7963 Design and Simulation of Microelectromechanical Systems *3 Credits*

Organizational Behavior, Systems, and Analytics, Human Capital Engineering & Analytics Concentration, M.S.

The concentration in human capital engineering and analytics will provide the latest innovations in HR management systems that integrate workforce analytics, information technology, knowledge management, process re-engineering, job/workplace design and other applications of organization science as well as industrial engineering to more effectively recruit, develop and retain talent for attaining organizational effectiveness.

The Curriculum

In any concentration there are four components to the Master of Science in Organizational Behavior degree:

1. Core Courses (required)
2. Concentration Courses (required & electives)
3. Free Electives (optional)
4. Research Project (required)

A total of 12 courses (36 credits) are required in these four components, as described below.

1. Core Courses

Core courses provide an introduction to the theory, research and practice basic to the field of organizational behavior. This scientific foundation consists of three core courses upon which the student can build a more applied cutting-edge specialization within the degree program.

Students who have previously completed courses as undergraduates in any of these areas may be excused from taking them by presenting proof of competence and receiving waivers from the Academic Director. Other courses must be substituted with permission of the Academic Director. Some core courses should be taken as early as possible in the program.

Required Core Courses: 9 Credits

- MG-GY 6013 Organizational Behavior *3 Credits*
- MG-GY 6313 Organization Theory and Design *3 Credits*
- MG-GY 6333 Research Methods in Organizational Behavior & Human Capital Systems *3 Credits*

2. Areas of Concentration

Students are expected to choose at least one of 5 areas of concentration, representing the applications or technologies, built on the scientific foundations from the field of Organizational Behavior. With the Academic Director's approval, a concentration may be revised to meet a student's special professional needs.

Each concentration consists of 9 credits of required courses plus at least 9 credits of elective courses selected from a list in each concentration. These may consist of 3 credit and 1.5 credit courses.

Students who have previously completed a specific course as undergraduates in any of the areas of concentration may be excused from taking that course by presenting proof of competence and receiving a waiver from the Academic Director. Other courses must be substituted, with permission of the Academic Director.

Courses in the aforementioned concentration are listed below:

3. Free Electives (optional): 6 Credits Maximum

Up to 6 credits of related graduate courses may be chosen from any program at the School of Engineering with the Academic Director's permission.

4. Research Project: 3 Credits

All students must submit an independent research project, typically during the final semester.

- MG-GY 9343 Research Project in Organizational Behavior *3 Credits*

Human Capital Engineering & Analytics Concentration: 18 Credits (minimum)

Required Courses: 9 Credits

- MG-GY 6181 Talent Management Systems *1.5 Credits*
- MG-GY 6343 Human Capital Engineering & Analytics *3 Credits*
- MG-GY 6361 Managing Business Process Reengineering *1.5 Credits*
- MG-GY 6391 Managing Knowledge-Based Enterprises *1.5 Credits*

Electives: Select 9 Credits (minimum)

- IE-GY 6453 Productivity Management *3 Credits*
- IE-GY 7653 Human Factors in Engineering Design *Credits*
- IE-GY 7933 Environmental Health and Safety *3 Credits*
- MA-GY 6853 Multivariate Analysis *3 Credits*
- MA-GY 6863 Regression and Analysis of Variance *3 Credits*
- MG-GY 6123 Human Resource Management *3 Credits*
- MG-GY 6163 Job and Workplace Design *3 Credits*
- MG-GY 6201 Consulting in Organizations *1.5 Credits*
- MG-GY 6211 Outsourcing: A Human Capital Strategy *1.5 Credits*
- MG-GY 6263 Human Resource Information Systems *3 Credits*
- MG-GY 6283 Web-Based Human Resource Management *3 Credits*
- MG-GY 6293 Managing Technical Professionals *3 Credits*
- MG-GY 6173 Performance Management and Reward Systems *3 Credits*
- MG-GY 6223 Staffing Systems in Organizations *3 Credits*
- MG-GY 6271 Managing Human Resource Technology in Organizations *1.5 Credits*
- MG-GY 6321 Global Human Resource Management *1.5 Credits*
- MG-GY 8203 Project Management *3 Credits*
- MG-GY 8653 Managing Technological Change and Innovation *3 Credits*
- MG-GY 8783 Managing Cloud Computing *3 Credits*

Organizational Behavior, Systems and Analytics, Human Resource Information Systems Concentration, M.S.

The concentration in human resource information systems integrates knowledge and skills in information systems and web-based technologies together with human resource management to achieve organizational effectiveness.

The Curriculum

In any concentration there are four components to the Master of Science in Organizational Behavior degree:

1. Core Courses (required)
2. Concentration Courses (required & electives)
3. Free Electives (optional)
4. Research Project (required)

A total of 12 courses (36 credits) are required in these four components, as described below.

1. Core Courses

Core courses provide an introduction to the theory, research and practice basic to the field of organizational behavior. This scientific foundation consists of three core courses upon which the student can build a more applied cutting-edge specialization within the degree program.

Students who have previously completed courses as undergraduates in any of these areas may be excused from taking them by presenting proof of competence and receiving waivers from the Academic Director. Other courses must be substituted with permission of the Academic Director. Some core courses should be taken as early as possible in the program.

Required Core Courses: 9 Credits

- MG-GY 6013 Organizational Behavior 3 *Credits*
- MG-GY 6313 Organization Theory and Design 3 *Credits*
- MG-GY 6333 Research Methods in Organizational Behavior & Human Capital Systems 3 *Credits*

2. Areas of Concentration

Students are expected to choose at least one of 5 areas of concentration, representing the applications or technologies, built on the scientific foundations from the field of Organizational Behavior. With the Academic Director's approval, a concentration may be revised to meet a student's special professional needs.

Each concentration consists of 9 credits of required courses plus at least 9 credits of elective courses selected from a list in each concentration. These may consist of 3 credit and 1.5 credit courses.

Students who have previously completed a specific course as undergraduates in any of the areas of concentration may be excused from taking that course by presenting proof of competence and receiving a waiver from the Academic Director. Other courses must be substituted, with permission of the Academic Director.

Courses in the aforementioned concentration are listed below:

3. Free Electives (optional): 6 Credits Maximum

Up to 6 credits of related graduate courses may be chosen from any program at the School of Engineering with the Academic Director's permission.

4. Research Project: 3 Credits

All students must submit an independent research project, typically during the final semester.

- MG-GY 9343 Research Project in Organizational Behavior *3 Credits*

Human Resource Information Systems Concentration: 18 Credits (minimum)

Required Courses: 9 Credits

- MG-GY 6123 Human Resource Management *3 Credits*
- MG-GY 6263 Human Resource Information Systems *3 Credits*
- MG-GY 6283 Web-Based Human Resource Management *3 Credits*

Electives: Select 9 Credits (minimum)

- MG-GY 6163 Job and Workplace Design *3 Credits*
- MG-GY 6173 Performance Management and Reward Systems *3 Credits*
- MG-GY 6181 Talent Management Systems *1.5 Credits*
- MG-GY 6223 Staffing Systems in Organizations *3 Credits*
- MG-GY 6271 Managing Human Resource Technology in Organizations *1.5 Credits*
- MG-GY 6293 Managing Technical Professionals *3 Credits*
- MG-GY 6343 Human Capital Engineering & Analytics *3 Credits*
- MG-GY 6361 Managing Business Process Reengineering *1.5 Credits*
- MG-GY 6391 Managing Knowledge-Based Enterprises *1.5 Credits*
- MG-GY 6503 Management of Information Technology and Information Systems *3Credits*
- MG-GY 7173 Enterprise Data Systems *3 Credits*
- MG-GY 8653 Managing Technological Change and Innovation *3 Credits*

Organizational Behavior, Systems and Analytics, Human Resources Management Concentration, M.S.

The concentration in human resource management prepares professionals to deal with the critical human issues involved in staffing, evaluating and rewarding employees in an era of rapidly changing work environments.

The Curriculum

In any concentration there are four components to the Master of Science in Organizational Behavior degree:

1. Core Courses (required)
2. Concentration Courses (required & electives)
3. Free Electives (optional)
4. Research Project (required)

A total of 12 courses (36 credits) are required in these four components, as described below.

1. Core Courses

Core courses provide an introduction to the theory, research and practice basic to the field of organizational behavior. This scientific foundation consists of three core courses upon which the student can build a more applied cutting-edge specialization within the degree program.

Students who have previously completed courses as undergraduates in any of these areas may be excused from taking them by presenting proof of competence and receiving waivers from the Academic Director. Other courses must be substituted with permission of the Academic Director. Some core courses should be taken as early as possible in the program.

Required Core Courses: 9 Credits

- MG-GY 6013 Organizational Behavior 3 *Credits*
- MG-GY 6313 Organization Theory and Design 3 *Credits*
- MG-GY 6333 Research Methods in Organizational Behavior & Human Capital Systems 3 *Credits*

2. Areas of Concentration

Students are expected to choose at least one of 5 areas of concentration, representing the applications or technologies, built on the scientific foundations from the field of Organizational Behavior. With the Academic Director's approval, a concentration may be revised to meet a student's special professional needs.

Each concentration consists of 9 credits of required courses plus at least 9 credits of elective courses selected from a list in each concentration. These may consist of 3 credit and 1.5 credit courses.

Students who have previously completed a specific course as undergraduates in any of the areas of concentration may be excused from taking that course by presenting proof of competence and receiving a waiver from the Academic Director. Other courses must be substituted, with permission of the Academic Director.

Courses in the aforementioned concentration are listed below:

3. Free Electives (optional): 6 Credits Maximum

Up to 6 credits of related graduate courses may be chosen from any program at the School of Engineering with the Academic Director's permission.

4. Research Project: 3 Credits

All students must submit an independent research project, typically during the final semester.

- MG-GY 9343 Research Project in Organizational Behavior *3 Credits*

Human Resource Management Concentration: 18 Credits (minimum)

Required Courses: 9 Credits

- MG-GY 6123 Human Resource Management *3 Credits*
- MG-GY 6173 Performance Management and Reward Systems *3 Credits*
- MG-GY 6223 Staffing Systems in Organizations *3 Credits*

Electives: Select 9 Credits (minimum)

- MG-GY 6113 Career Management *3 Credits*

- MG-GY 6131 Labor Relations *1.5 Credits*
- MG-GY 6141 Conflict Management *1.5 Credits*
- MG-GY 6181 Talent Management Systems *1.5 Credits*
- MG-GY 6191 Coaching in Organizations *1.5 Credits*
- MG-GY 6211 Outsourcing: A Human Capital Strategy *1.5 Credits*
- MG-GY 6253 Seminar in Organization and Career Change *3 Credits*
- MG-GY 6263 Human Resource Information Systems *3 Credits*
- MG-GY 6271 Managing Human Resource Technology in Organizations *1.5 Credits*
- MG-GY 6283 Web-Based Human Resource Management *3 Credits*
- MG-GY 6293 Managing Technical Professionals *3 Credits*
- MG-GY 6321 Global Human Resource Management *1.5 Credits*
- MG-GY 6343 Human Capital Engineering & Analytics *3 Credits*
- MG-GY 6361 Managing Business Process Reengineering *1.5 Credits*
- MG-GY 8653 Managing Technological Change and Innovation *3 Credits*
- IE-GY 7933 Environmental Health and Safety *3 Credits*

Organizational Behavior, Systems and Analytics, Management of Change Concentration, M.S.

The concentration in management of change provides human resource professionals and managers with the latest tools and techniques necessary to guide organizations and their employees through periods of rapid, potentially disruptive change, especially transitions created by changing technologies.

The Curriculum

In any concentration there are four components to the Master of Science in Organizational Behavior degree:

1. Core Courses (required)
2. Concentration Courses (required & electives)
3. Free Electives (optional)
4. Research Project (required)

A total of 12 courses (36 credits) are required in these four components, as described below.

1. Core Courses

Core courses provide an introduction to the theory, research and practice basic to the field of organizational behavior. This scientific foundation consists of three core courses upon which the student can build a more applied cutting-edge specialization within the degree program.

Students who have previously completed courses as undergraduates in any of these areas may be excused from taking them by presenting proof of competence and receiving waivers from the Academic Director. Other courses must be substituted with permission of the Academic Director. Some core courses should be taken as early as possible in the program.

Required Core Courses: 9 Credits

- MG-GY 6013 Organizational Behavior 3 *Credits*
- MG-GY 6313 Organization Theory and Design 3 *Credits*
- MG-GY 6333 Research Methods in Organizational Behavior & Human Capital Systems 3 *Credits*

2. Areas of Concentration

Students are expected to choose at least one of 5 areas of concentration, representing the applications or technologies, built on the scientific foundations from the field of Organizational Behavior. With the Academic Director's approval, a concentration may be revised to meet a student's special professional needs.

Each concentration consists of 9 credits of required courses plus at least 9 credits of elective courses selected from a list in each concentration. These may consist of 3 credit and 1.5 credit courses.

Students who have previously completed a specific course as undergraduates in any of the areas of concentration may be excused from taking that course by presenting proof of competence and receiving a waiver from the Academic Director. Other courses must be substituted, with permission of the Academic Director.

Courses in the aforementioned concentration are listed below:

3. Free Electives (optional): 6 Credits Maximum

Up to 6 credits of related graduate courses may be chosen from any program at the School of Engineering with the Academic Director's permission.

4. Research Project: 3 Credits

All students must submit an independent research project, typically during the final semester.

- MG-GY 9343 Research Project in Organizational Behavior *3 Credits*

Management of Change Concentration: 18 Credits (minimum)

Required Courses: 9 Credits

- MG-GY 6163 Job and Workplace Design *3 Credits*
- MG-GY 6243 Change Management Systems in Organizations *3 Credits*
- MG-GY 6253 Seminar in Organization and Career Change *3 Credits*

Electives: Select 9 Credits (minimum)

- MG-GY 6113 Career Management *3 Credits*
- MG-GY 6123 Human Resource Management *3 Credits*

- MG-GY 6141 Conflict Management *1.5 Credits*
- MG-GY 6153 Leadership Development and Team Building *3 Credits*
- MG-GY 6181 Talent Management Systems *1.5 Credits*
- MG-GY 6191 Coaching in Organizations *1.5 Credits*
- MG-GY 6201 Consulting in Organizations *1.5 Credits*
- MG-GY 6211 Outsourcing: A Human Capital Strategy *1.5 Credits*
- MG-GY 6233 Training Systems in Organizations *3 Credits*
- MG-GY 6271 Managing Human Resource Technology in Organizations *1.5 Credits*
- MG-GY 6321 Global Human Resource Management *1.5 Credits*
- MG-GY 6343 Human Capital Engineering & Analytics *3 Credits*
- MG-GY 6361 Managing Business Process Reengineering *1.5 Credits*
- MG-GY 6391 Managing Knowledge-Based Enterprises *1.5 Credits*
- MG-GY 8653 Managing Technological Change and Innovation *3 Credits*

Organizational Behavior, Systems and Analytics, Training and Development Concentration, M.S.

The concentration in training and development prepares human resource professionals to design, administer and evaluate complex training and development programs, particularly in organizations affected by the introduction of new technology.

The Curriculum

In any concentration there are four components to the Master of Science in Organizational Behavior degree:

1. Core Courses (required)
2. Concentration Courses (required & electives)
3. Free Electives (optional)
4. Research Project (required)

A total of 12 courses (36 credits) are required in these four components, as described below.

1. Core Courses

Core courses provide an introduction to the theory, research and practice basic to the field of organizational behavior. This scientific foundation consists of three core courses upon which the student can build a more applied cutting-edge specialization within the degree program.

Students who have previously completed courses as undergraduates in any of these areas may be excused from taking them by presenting proof of competence and receiving waivers from the Academic Director. Other courses must be substituted with permission of the Academic Director. Some core courses should be taken as early as possible in the program.

Required Core Courses: 9 Credits

- MG-GY 6013 Organizational Behavior 3 Credits
- MG-GY 6313 Organization Theory and Design 3 Credits
- MG-GY 6333 Research Methods in Organizational Behavior & Human Capital Systems 3 Credits

2. Areas of Concentration

Students are expected to choose at least one of 5 areas of concentration, representing the applications or technologies, built on the scientific foundations from the field of Organizational Behavior. With the Academic Director's approval, a concentration may be revised to meet a student's special professional needs.

Each concentration consists of 9 credits of required courses plus at least 9 credits of elective courses selected from a list in each concentration. These may consist of 3 credit and 1.5 credit courses.

Students who have previously completed a specific course as undergraduates in any of the areas of concentration may be excused from taking that course by presenting proof of competence and receiving a waiver from the Academic Director. Other courses must be substituted, with permission of the Academic Director.

Courses in the aforementioned concentration are listed below:

3. Free Electives (optional): 6 Credits Maximum

Up to 6 credits of related graduate courses may be chosen from any program at the School of Engineering with the Academic Director's permission.

4. Research Project: 3 Credits

All students must submit an independent research project, typically during the final semester.

- MG-GY 9343 Research Project in Organizational Behavior *3 Credits*

Training and Development Concentration: 18 Credits (minimum)

Required Courses: 9 Credits

- MG-GY 6113 Career Management *3 Credits*
- MG-GY 6233 Training Systems in Organizations *3 Credits*
- MG-GY 6243 Change Management Systems in Organizations *3 Credits*

Electives: Select 9 Credits (minimum)

- MG-GY 6123 Human Resource Management *3 Credits*
- MG-GY 6141 Conflict Management *1.5 Credits*

- MG-GY 6153 Leadership Development and Team Building *3 Credits*
- MG-GY 6163 Job and Workplace Design *3 Credits*
- MG-GY 6181 Talent Management Systems *1.5 Credits*
- MG-GY 6191 Coaching in Organizations *1.5 Credits*
- MG-GY 6201 Consulting in Organizations *1.5 Credits*
- MG-GY 6253 Seminar in Organization and Career Change *3 Credits*
- MG-GY 6271 Managing Human Resource Technology in Organizations *1.5 Credits*
- MG-GY 6321 Global Human Resource Management *1.5 Credits*
- MG-GY 6343 Human Capital Engineering & Analytics *3 Credits*
- MG-GY 6391 Managing Knowledge-Based Enterprises *1.5 Credits*
- MG-GY 8653 Managing Technological Change and Innovation *3 Credits*

Translational Surface Engineering, M.S.

Requirements for the Master of Science

Candidates for the MS in Translational Surface Engineering should plan their program in accordance with the list of requirements below. 34 credits are required to complete the program.

Required Courses (16 Credits)

Core Courses

- CBE-GY 6153 Applied Mathematics in Engineering 3 Credits
- CBE-GY 7043
- CBE-GY 6413
- CBE-GY 6333 Transport Phenomena 3 Credits
- CBE-GY 6412

Seminars

- CBE-GY 9711
- CBE-GY 9721

Electives

All students can select from electives, as long as they select engineering courses to satisfy the minimum of 24 engineering credits.

Science/Engineering Courses

- ME-GY 5243 Composite Materials 3 Credits
- CBE-GY 7443
- CBE-GY 7413
- CBE-GY 7423
- CBE-GY 7443
- CBE-GY 7453
- CBE-GY 9463

Management/Finance Courses

- MG-GY 8203 Project Management *3 Credits*
- MG-GY 6083 Economics *3 Credits*
- MG-GY 8653 Managing Technological Change and Innovation *3 Credits*
- MG-GY 7873 Managing Intellectual Property and Intellectual Capital *3 Credits*

Thesis/Project Options

- CBE-GY 9973
- CBE-GY 9023

Transportation Management, M.S.

Master of Science in Transportation Management

The program is for practicing professionals who deal with a public transit system, and agency and/or facility management. It combines basic management skills with a working knowledge of techniques and approaches to optimize transportation system results.

Goals and Objectives

The primary goal of the MS in Transportation Management is to prepare professionals to effectively and efficiently manage various transportation enterprises. The emphasis is on agencies, facilities and services in the public sector. Specific objectives of the program are to provide:

- a basic background in management skills and techniques, specifically as applied to public and private transportation organizations;
- basic understanding of the economic aspects of the transportation sector;
- an understanding of the importance of national, state and local transportation policy on public and private sector organizations;
- fundamental knowledge on some specific issues and problems in managing and operating public transportation facilities.

Program Requirements

Required Courses: 18 Credits

The following courses are required of all students:

- TR-GY 6011 Fundamental Concepts in Transportation *1.5 Credits*
- TR-GY 6211 Economic Analysis of Transportation Alternatives *1.5 Credits*
- TR-GY 6223 Intelligent Transportation Systems and Their Applications *3 Credits*
- TR-GY 7223 Management of Transit Maintenance and Operations *3 Credits*
- TR-GY 7213 Transportation Management *3 Credits*
- TR-GY 7133 Urban Public Transportation Systems *3 Credits*

Electives: 12 Credits

Students will take elective courses in the following areas:

- Management Electives (MG, subject to prerequisites), *6 credits*

- Transportation Electives (TR, subject to prerequisites), *6 credits*
- One (1) Elective in either Management or Transportation, *3 credits*

Transportation Planning and Engineering, M.S.

Master of Science in Transportation Planning and Engineering

The MS program has a strong foundation in traffic engineering, transportation planning, transportation economics, public transportation systems and intelligent transportation systems. Students are exposed to a learning atmosphere that provides a meaningful combination of theoretical and practical approaches. Courses include a mix of presentations, workshop and project exercises, and practical problem solutions.

The program focuses on (1) material suited to the issues and projects students will face on the job, so that they are immediately productive; (2) material packaged by the course so that each course provides specific skills and knowledge, enabling the student to be immediately productive; (3) project-based learning in multiple courses, as an underlying approach to teaching the courses and the program; (4) modern tools integrated into the courses, including, but not limited to: Synchro and SIM-Traffic and HCS+; (5) design problems taught through a project/case studies approach; (6) statistics integrated into courses, with moderately advanced skills in Excel and Word expected in all courses (but not explicitly taught).

The program includes a strong focus on the rapidly emerging field of intelligent transportation systems. This field applies telecommunications and information technology to solving a variety of transportation functions, from route guidance systems to automated toll collection systems to the automated highway.

Goals and Objectives

The primary goal of the MS in Transportation Planning and Engineering is to prepare transportation professionals to plan, functionally design, control and operate facilities, systems and services that satisfy the demand for passenger and freight transportation. Specific objectives of the program are to provide the skills necessary to:

- Fundamentally understand the nature and generation of transportation AIMSUN demands;
- Understand the political, policy and economic forces that affect transportation demands and the public framework in which they are addressed;
- Control and operate traffic and other transportation facilities; and
- Apply information technologies to intelligent transportation systems.

Program Requirements

Required Courses: 21 Credits

- TR-GY 6011 Fundamental Concepts in Transportation *1.5 Credits*

- TR-GY 6021 Quantitative Analysis in Transportation *1.5 Credits*
- TR-GY 6113 Forecasting Urban Travel Demand *3 Credits*
- TR-GY 6211 Economic Analysis of Transportation Alternatives *1.5 Credits*
- TR-GY 6223 Intelligent Transportation Systems and Their Applications *3 Credits*
- TR-GY 6231 Transportation Planning Principles and Practice *1.5 Credits*
- TR-GY 6333 Transportation and Traffic Concepts, Characteristics, and Studies *3Credits*
- TR-GY 6343 Traffic Operations & Control *3 Credits*
- TR-GY 6403 Transportation and Traffic Project *3 Credits*

Electives: Select 9 Credits

- TR-GY 7033 Multimodal Transportation Safety *3 Credits*
- TR-GY 7123 Management of Urban Traffic Congestion *3 Credits*
- TR-GY 7133 Urban Public Transportation Systems *3 Credits*
- TR-GY 7213 Transportation Management *3 Credits*
- TR-GY 7223 Management of Transit Maintenance and Operations *3 Credits*
- TR-GY 7243 Intelligent Transportation Systems: Deployments and Technologies *3Credits*
- TR-GY 7323 Design of Parking and Terminal Facilities *3 Credits*
- TR-GY 7353 Adaptive Control, Simulation, and Software *3 Credits*
- TR-GY 8013 Selected Topics in Transportation I *3 Credits*
- and/or
- TR-GY 8023 Selected Topics in Transportation II *3 Credits*
- TR-GY 8011 Special Topics in Transportation A *1.5 Credits*
- and/or
- TR-GY 8021 Special Topics in Transportation B *1.5 Credits*
- TR-GY 900X Readings in Transportation *Variable Credits*
- TR-GY 997X MS Thesis in Transportation *3 Each Credits*

Note:

MS students in the Transportation Planning and Engineering program may take 3 credits of free electives from any graduate course offering at NYU SOE, assuming that the student has the necessary prerequisites. Adviser approval is required for all elective selections.

Urban Infrastructure Systems, M.S.

With the fast growth of urban population local governments, public service agencies, and urban utilities presently face increasing public demand for greater reliability, safety, affordability and resiliency of the aging urban infrastructure systems. These systems have to be continuously adapted and upgraded (often with technology-driven solutions) to efficiently support the essential public services, urban development and economic growth.

The infrastructure systems support a variety of urban sectors, including transportation, energy & water supply, sanitation & wastewater management, public buildings, district heating, public health & safety, waste management, telecommunication and other essential services. Their sustainable development engages a wide variety of public and private sector stakeholders and greatly depends on a broad range of institutional, environmental, economic, societal and operational factors. Such factors include public policy objectives, land use and geo-physical system characteristics, regulatory requirements, environmental issues, availability of renewable resources, customers' awareness and culture, management capabilities, and other operational state variables. With rising societal concerns with regard to climate change impact, environmental sustainability and economic viability of the fast-growing urban centers, both Government and Industry presently face increasing needs for innovative capabilities of dynamic monitoring and "smart" system control to effectively meet the challenge of upgrading the aging urban infrastructure systems.

Facing these urban sustainability challenges, recent developments of Information Technology based "smart" infrastructure monitoring and control capabilities have been increasingly integrated in operation system optimization, early incident detection and proactive mitigation, for upgrading the operational efficiency, safety and service quality of the infrastructure systems. These innovative solutions are currently driving a significant paradigm shift from reactive to preemptive engineering and management of these urban systems, across the wide array of public service sectors that they support. The infrastructure industry development goal is to provide the engineers and managers of the urban systems with upgraded decision making capabilities to better cope with the growing environmental risks, economic constraints, and complex operational uncertainties and effectively respond to the growing societal demand.

The interdisciplinary MS Program in Urban Infrastructure Systems targets the development of a broad understanding of the infrastructure management challenges facing metropolitan governments and urban utilities. Cutting across different disciplines of engineering, infrastructure financing, environmental policy and planning, the program is focused on the needs and methodologies for integrating policy decision making, intelligent technology solutions, and risk-based system analysis in urban infrastructure systems management to effectively meet the emerging challenges of sustainable urban developments. Following five core courses, students may select an area of specialization in a specific urban sector, as indicated in the list of proposed majors. They are also required to complete a 3-credit Capstone project or a 6-credit Master Thesis.

With specialized faculty members from Government, Industry and Academia, the program is designed for professionals, with both engineering and non-engineering backgrounds, who are involved and/or interested in the fast growing interdisciplinary field of urban systems management and career opportunities with government agencies, public and private sector utilities, and service industries across the wide array of the metropolitan sectors.

To accomplish these objectives the program includes:

- Core courses (5 courses, 3 credits each) related to challenges of infrastructure management strategies across the sectors.
- Majors (3 to 4 courses, 3 credits each) related to infrastructure management strategies for selected urban sectors, including: Urban Transportation Planning & Management, Urban Water Supply & Environmental Systems management, Smart Building & Energy Supply, Urban Construction Engineering & Management and Infrastructure Systems Planning & Management.
- Interdisciplinary Capstone Project (3 credits) or MS Research Thesis (6 credits) on a selected topic.

Requirements for the Master of Science

Program Core: 15 Credits

All students must complete the following five courses¹:

- CE-GY 7813 Infrastructure Planning, Engineering and Economics *3 Credits*
- CE-GY 7843 Introduction to Urban Systems Engineering *3 Credits*
- CE-GY 7853 Concepts and Implementation of Infrastructure Management Systems *3Credits*
- CE-GY 7673 Environmental Impact Assessment *3 Credits*
- CE-GY 8733 Infrastructure Financing: Structuring of a Deal *3 Credits*²

Note:

¹ Core courses can be substituted by other selected courses upon approval of the academic advisor.

² Course is part of the Exec 21 program; special requirements (see Construction Management Program) or permission of adviser required.

Minor, Technical and Free Electives:

Each minor area of study includes: (1) three minor courses, required for the minor; and (2) two to three technical electives, available to all program students.

Students may elect not to take a specified minor area. They may, instead, take five or six technical electives from the approved list in any specified area. The number of technical electives is influenced by whether the student elects to do a 3-credit case study report or a 6-credit MS thesis, as described in a later section.

Minor Areas of Concentration

- Transportation Systems Management (TSM)
- Construction Management (CM)
- Environmental Systems Management (ESM)
- Civil Infrastructure Systems Management (CISM)

Because of course content, students selecting the CISM minor should hold a BS in Civil Engineering or the equivalent.

Minor in Transportation Systems Management

Credits required in the minor:

- TR-GY 7223 Management of Transit Maintenance and Operations *3 Credits*
- TR-GY 6223 Intelligent Transportation Systems and Their Applications *3 Credits*
- TR-GY 7133 Urban Public Transportation Systems *3 Credits*

Approved Technical Electives in Transportation

- TR 6133 Travel Demand Forecasting *3 Credits*
- TR-GY 7123 Management of Urban Traffic Congestion *3 Credits*

Note:

Additional electives may be approved by the adviser.

Minor in Construction Management

Required in Minor:

- CE-GY 8253 Project Management for Construction *3 Credits*
- CE-GY 8713 Construction and the Law *3 Credits*²

- CE-GY 8723 How to Succeed in Construction 3 Credits²

Note:

² Course is part of the Exec 21 program; special requirements (see Construction Management Program) or permission of adviser required.

Approved Technical Electives in Construction:

- CE-GY 8273 Contracts and Specifications 3 Credits
- CE-GY 8783 Construction Management and Planning 3 Credits²
- CE-GY 8703 Managing and Leading in the 21st Century 3 Credits²

Note:

Additional electives may be approved by the adviser.

² Course is part of the Exec 21 program; special requirements (see Construction Management Program) or permission of adviser required.

Minor in Environmental Systems Management

Credits required in the minor:

- CE-GY 7753 Environmental Systems Management 3 Credits
- CE-GY 7533 Hazardous/Toxic Waste Management 3 Credits
- CE-GY 7563 Environmental Law 3 Credits

Approved Technical Electives in Environmental Studies:

- CE-GY 7473 Modeling Fate and Transport of Surface Water Pollution 3 Credits
- CE-GY 7523 Air Pollution 3 Credits
- CE-GY 7543 Site Remediation 3 Credits
- CE-GY 6053 Monitoring Cities 3 Credits

Note:

Additional electives may be approved by the adviser.

Minor in Civil Infrastructure Systems Management

Recommended courses which can be substituted upon approval of the academic advisor:

- CE-GY 7863 Infrastructure Monitoring and Performance Assessment *3 Credits*
- CE-GY 6063 Bridge Engineering *3 Credits*
- CE-GY 8433 Urban Geotechnology *3 Credits*

Approved Technical Electives in Infrastructure Systems:

- CE-GY 6143 Steel Structures *3 Credits*
- CE-GY 8433 Urban Geotechnology *3 Credits*
- CE-GY 8493 Environmental Geotechnology *3 Credits*

Note:

Additional electives may be approved by the adviser.

Capstone Experience

Students fulfill the requirement for a meaningful Capstone experience by completing an independent case study in urban infrastructure systems (3 credits) or a master's thesis on a topic of independent study (6 credits).

All course descriptions for Urban Infrastructure Systems are found in the Civil Engineering section of this catalog.

Doctor of Philosophy Programs

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Biomedical Engineering, Ph.D.

The primary goal of the PhD in Biomedical Engineering [BME] is to provide students with an in-depth, advanced education that will give them the tools needed to perform fundamental and applied research in biomedical engineering. Alternatively, students will gain the requisite technical knowledge that they may wish to apply to management, marketing, sales, and other entrepreneurial activities related to biomedical engineering.

Specific Objectives include:

- To provide students that have either a BS or an advanced degree in any engineering; mathematics; or natural science discipline with a tailored program of study that will ensure their competency and competitiveness in BME.
- To provide students with a cutting edge program that integrates engineering, biological and medical sciences such that students will acquire the requisite skills to participate in technological innovations that provide people with longer, healthier and more productive lives.
- To better accomplish the above, to merge the leadership and talents found at NYU Tandon in chemistry, engineering and computer science with the expertise in medical sciences at the Health Sciences Center at SUNY Downstate Medical Center.
- To give students an opportunity to focus on topics that include: 1) Biomaterials and Polymer Therapeutics; 2) Bio-imaging and Neuro-engineering.
- To give students the option of doing research in the laboratories at NYU Tandon or SUNY Downstate Medical Center. Students may also substitute research units with course electives.

STRUCTURE AND REQUIREMENTS FOR DEGREE COMPLETION:

The PhD degree in Biomedical Engineering is awarded to a student upon successful completion of 75 credits and the defense of a comprehensive thesis research project. The credits are broken down as 39 course credits and 36 doctoral thesis research credits. A maximum of 30 course credits may be transferred from previous graduate course work. Thesis credits can only be taken upon passing the qualifying exam.

The program has three separate, entry-level pathways to accommodate students entering with a bachelor's degree in any of the following disciplines: (1) chemical engineering; (2) mechanical engineering, electrical engineering, computer science engineering or physics; and (3) chemistry, biology or premedical studies. By accommodating these students with varying academic backgrounds, we intend to further encourage communication, in keeping with the interdisciplinary nature of biomedical engineering. Students will be required to take at least one, but not more than two, of NYU Tandon School of Engineering's management of technology courses. Students will be obliged to participate in

BE-GY 9753 Bioethics Seminar, a course on responsible conduct in research, as required by the National Institutes of Health (NIH) for training grant funding joint institutionally; to participate in Journal Clubs; and to attend the jointly sponsored SUNY/NYU Tandon Biomedical Engineering Seminar Series. The required PhD thesis research may be conducted under the supervision of a faculty member from either institution. We expect that these students will need four to six years to complete the doctoral program, depending upon their admission status.

Candidates whose thesis research advisors are NYU Tandon faculty will be required to register at NYU Tandon and will accumulate a minimum total of 75 credits; whereas those candidates whose thesis research advisers are SUNY Downstate [SGS] faculty will be required to register at Downstate and will accumulate the requisite number of credits specified by SGS's degree requirement. The same joint PhD degree will be conferred regardless of the campus at which the student registers; the research requirements for all graduate students in the program are identical.

Each student will be required to register for all of the courses through the standard registration process at student's home institution, irrespective of where the courses are actually held. The Registrars at each institution will keep accounts of the numbers of credits taken by their BME PhD students at the alternate institution. Those credits will be tallied at the close of every two academic years, or every other June.

Passing a doctoral qualifying examination, scheduled within the first two years, is required to advance to candidacy for the PhD degree. Students are directed to read the information within the **Qualifying Examination Guidelines**, below. In the case of failure, the right to a second examination is at the discretion of the examination committee in consultation with the BME program directors at NYU Tandon and SUNY Downstate, and the graduate dean or associate dean from the campus at which the BME student is enrolled. The results of each student's examination will be delivered to the Registrar of the NYU Tandon and SGS, in writing, no later than one week following the exam.

PROGRAM ADMISSION

An admission committee composed of faculty from both SGS and NYU Tandon will review BME PhD applications. Requirements for acceptance to the program will include (1) academic excellence, (2) interests congruent with those of program faculty, and (3) positive recommendations from former research advisors. Admissions committee member and faculty members whose research interests match those of the candidate, either in person or by a conference call, will interview all viable candidates.

Bachelor's level students accepted into the BME PhD program will be expected to register at the campus where the faculty research best matches their own interests. While this early commitment to a research area is dissimilar to other doctoral programs at SGS, it is essential given the early tuition and stipend obligations at NYU Tandon. A faculty thesis advisor must accept students with an MS who wish to enter the BME PhD before they will be allowed to enroll.

Thesis Research: Procedures for academic advising, and for supervision and evaluation of students' progress through degree completion.

Members of the student's thesis/advisory committee, with the participation of the BME program director, will monitor the individual student's progression through the BME PhD program, as in the other doctoral programs at SGS and NYU Tandon. To accommodate the changing needs of each student based upon his or her research project, the composition of the committee is designed for flexibility. At each stage of a student's career it is important to determine if they are progressing at a rate sufficient for success as a doctoral candidate. This includes the successful and timely completion of course work and examinations. The following schedule is suggested:

Year 1: Both BS or MS level students are expected to register for course work to prepare for their doctoral qualifying examination.

Year 2: The qualifying examination committee will be formed and consist of three members; one must hold a PhD in an engineering discipline. Student will take the doctoral qualifying examination. Those that pass are allowed to continue to year 3 as doctoral candidates and will be allowed to register for BE-GY 999X PhD Thesis Research in Biomedical Engineering

Year 3: The thesis/advisory committee will be formed. This committee will consist of six members, selection of which will be primarily based on the area of the student's research. All attempts should be made to include a least two members from the student's qualifying exam committee, one member should have expertise within the track focus chosen by the student; one member should have a PhD in engineering; two members should be from a department other than the one in which the thesis advisor is affiliated. The sixth member, an outside examiner, should be selected and be present at the thesis pre-defense, and may also become involved in the proposal defense, at the student and advisor's invitation.

Year 4: The thesis/advisory committee, including the external member, will monitor student progress during the thesis pre-defense. Internal members of the thesis research advisory committee monitor the thesis defense; attendance by the external member at the thesis defense is optional.

Below is a chronological description of the process by which a student will progress from thesis proposal to thesis defense.

Student submits written version of thesis proposal to the committee two weeks in advance of the Oral Proposal defense.

1. Oral Proposal Defense. This is a formal presentation by the student before the program's students and faculty.
2. Chair of committee writes a letter to the student containing the committee's determination of the proposal defense (Acceptable, Acceptable with Modifications or Unacceptable). The letter should describe what experiments are required for completion of the thesis work. This is a contract with the student.
3. Student submits written thesis to committee, including to the outside examiner, two weeks in advance of the Pre-defense of the thesis.
4. Pre-defense. Student must defend a written document and respond to questions regarding research. (The format is oral. A formal presentation on the part of the student is discouraged; a brief informal presentation may occur if desired by the chairman.)
5. Chair of committee writes a letter to student containing the committee's determination of what changes are required for the final document.
6. Student submits final document to committee members two weeks prior to the defense, or one week if agreed upon by all committee members.
7. Defense. First there is a formal, public presentation by the student, with questions from the audience. Following the public presentation, the student meets privately with the committee members for questions. The committee makes a decision that is then transmitted, in writing, to the Registrar.

QUALIFYING EXAM GUIDELINES

A two-part qualifying examination, scheduled for no later than the fall semester of the second year, is required to advance to candidacy for the Ph.D. degree. Students must submit a formal application to take the exam during registration for the spring semester of that year. The application should include the names of three or more faculty who are willing to serve on the qualifying examination committee; these must be approved by the Program Director of the student's home campus. The committee must have at least one faculty member from the campus not directly sponsoring the student, and a member or designee of the executive committee.

The purpose of the qualifying examination is to test general knowledge of Bioengineering, and in particular knowledge that is pertinent to the track in which the student is enrolled, and is intended to discern the student's ability to communicate ideas and concepts. While the exam is a test of general knowledge, students are expected to be especially knowledgeable in the scientific area related to their proposed research.

The format of the examination is in two parts. In part one the student will receive one essay question from each of the examiners that they will have one week to answer. The thesis examining committee will either pass or fail the student on this written part. If this part of the examination is passed, the student will be allowed to take the oral part of the examination.

During the oral part of the examination, questions from the committee will not necessarily be limited to the student's essay questions, but may cover other aspects of the student's academic training up to that point. The intent is to focus the committee's attention, and to make the members aware of the areas of interest in which the student might be expected to have particular knowledge.

The examination will be graded as pass or fail by majority vote. In the case of failure, the right to a second examination is at the discretion of the executive committee and the Graduate Dean or Associate Dean for Biomedical Engineering of the campus at which the student is enrolled. An unsatisfactory performance in the qualifying examination may result in cancellation of the student's registration in the sponsoring program. The decision of whether to cancel registration in the program or to offer an opportunity for reexamination is made by the Executive Committee of the Program on the basis of the student's overall academic performance. This decision is not subject to formal appeal.

The result of each student's examination will be delivered to the Graduate School, in writing, no later than one week following the exam.

Chemical Engineering, Ph.D.

Requirements for the Doctor of Philosophy in Chemical Engineering

Students must pass a comprehensive qualifying examination in chemical engineering and present a doctoral dissertation. The qualifying exam is given once a year. Additional details on the qualifying examination should be obtained from the graduate adviser. Each doctoral candidate must complete a minimum of 75 credits of academic work past the bachelor's degree, including a minimum of 45 credits of dissertation research. Although the student may elect to take more than 45 credits of PhD thesis, only 45 of those credits can be counted in the required 75 credits. Furthermore, of those 45 credits, at least 36 must be taken beyond MS thesis and at the NYU Tandon School of Engineering. A minimum of 30 graduate credits beyond the bachelor's degree (not including PhD or MS thesis credits) are required in chemical engineering subjects and related subjects, of which at least 12 must be taken at the NYU Tandon School of Engineering. Attendance is required at departmental seminars for at least four semesters.

To meet graduation requirements, students must have an overall B average in all courses, excluding thesis, and must not obtain more than two grades of C in required subjects. Candidates for the degree Doctor of Philosophy in Chemical Engineering should plan their programs in accordance with the following requirements:

Required Subjects: 12 credits, 3 credits each

- CBE-GY 6153 Applied Mathematics in Engineering 3 Credits
- CBE-GY 6333 Transport Phenomena 3 Credits
- CBE-GY 6813 Chemical Reactor Analysis and Design 3 Credits
- CBE-GY 9910 Seminar in Chemical and Biomolecular Engineering 0 Credits *
- CBE-GY 9920 Seminar in Chemical and Biomolecular Engineering 0 Credits *
- CM-GY 7043 Statistical Thermodynamics and Kinetics 3 Credits

Electives: 18 Credits

At least three electives (9 credits) must be chosen from approved CBE courses, 6000-level and above.

The remaining courses may be chosen from other graduate programs with the approval of the graduate adviser in chemical engineering.

Thesis: 45 Credits

-
- CBE-GY 999X PhD Dissertation in Chemical & Biological Engineering *45 Credits total, each 3 Credits*

Note:

Up to 9 credits of Master's Thesis can be included here.

Total: 75 Credits

Note:

* CBE-GY 9910/CBE-GY 9920 must be taken for two years.

Civil Engineering, Ph.D.

Doctoral Program in Civil Engineering

The Department of Civil and Urban Engineering currently offers two doctoral degree programs: PhD in Civil Engineering and PhD in Transportation Planning and Engineering. Requirements for the Civil Engineering degree are detailed here. For information on the Transportation Planning and Engineering program, see the “Transportation” section of this catalog.

Goals and Objectives

The PhD in Civil Engineering is research-oriented and intended for those whose goal is a career in civil engineering research and/or teaching at the university level or in private research organizations. Specific doctoral program objectives are to develop the skills and knowledge necessary to:

- Specialize within one of the subdisciplines of civil engineering;
- Perform independent fundamental research in one of the subdisciplines of civil engineering;
- Produce a piece of fundamental research that advances meaningfully the state of the art of one of the subdisciplines of civil engineering and is publishable in a first-tier refereed civil engineering related journal.

A PhD is granted for the invention or creation of new knowledge in civil engineering. This knowledge may result from analytical, numerical or experimental research. The knowledge may be practical or fundamental in nature.

Areas of Concentration

Students pursuing the PhD in Civil Engineering must choose to specialize in one of the following subdisciplines of civil engineering:

- Structural Materials and Engineering
- Geotechnical and Geo-environmental Engineering
- Environmental and Water Resources Engineering
- Construction Management and Engineering
- Highway and Traffic Engineering
- Urban Infrastructure Systems Engineering and Management

Other focus areas are possible and can be developed with the assistance of faculty advisers. All subject areas must be relevant to the degree sought, and a faculty member must be willing and able to guide the student’s research.

Program Administration

The Department of Civil and Urban Engineering has five graduate program coordinators:

- Graduate Program Coordinator for Civil Engineering (MS and PhD)
- Graduate Program Coordinator for Environmental Engineering/ Environmental Science (MS)
- Graduate Program Coordinator for Urban Systems Engineering and Management (MS)

- Graduate Program Coordinator for Transportation (MS and PhD)
- Graduate Program Coordinator for Construction Management and Engineering (MS)

The graduate coordinators form the departmental Graduate Committee. The Committee reviews all PhD applications and makes admissions decisions, which are implemented by a graduate coordinator. For each registration, the student's program must be approved by the academic adviser and signed by the graduate coordinator.

Admission Criteria

1. Admission to the PhD in Civil Engineering requires an MS in Civil Engineering or equivalent with a GPA of 3.5 or better (on a 0-4 scale).
2. All applicants are required to submit GRE scores for consideration.
3. International applicants must take the TOEFL examination and submit the results for consideration.

In criterion 1 above, the "equivalent" can be achieved in several ways. The candidate may have a MS degree with a different title that covers substantially the same material. In more general terms, the applicant must demonstrate that he or she has the equivalent of all undergraduate and master's-level course work to be able to pursue doctoral-level work in the chosen major area, as well as in a minor area within the umbrella of civil engineering. Further, "equivalence" is evaluated based on the totality of the student's undergraduate and graduate record, not course by course. Thus, an applicant who wishes to pursue doctoral work in Environmental Engineering, for example, must have the entire undergraduate and master's-level course background expected in Environmental Engineering, but need not demonstrate such a background in structures. Because admission to a PhD program requires a relevant MS (or equivalent), an applicant who has not yet earned a master's degree will be admitted as MS student and is expected to earn an MS degree while completing the major and minor course requirements. In rare cases, an applicant with only a BS degree may be directly admitted into the PhD program with the written approval of the department head.

Doctoral Program of Study

Every PhD student upon admission is assigned an academic adviser, who is designated by the department head. Any member of the civil engineering faculty may be an academic adviser to a PhD student. The first meeting should take place shortly after receiving an acceptance letter from the Admissions Office. During this first meeting the student's Program of Study should be established. The Program of Study should include a list of the fundamental and advanced topics that will comprise the specific courses, the subject matter for the qualifying exam and possible research areas.

In cases where a student is supported on a research contract, the principal investigator of the contract will normally be the student's academic adviser. Where a student has a particular research interest and is working with a particular faculty member, the student may request that faculty member for his or her academic adviser. In rare cases, when a PhD student enters the program without a prior selection of a major area of study, the initial academic adviser will be the graduate coordinator of the program area. Each PhD candidate reports to two advisory committees: an Academic Advisory Committee and a Dissertation Committee.

Academic Advisory Committee

The student's academic adviser plans a program to fulfill major and minor requirements for the PhD degree. The Academic Advisory Committee generally consists of the academic adviser and one faculty member for each minor area of study. The Academic Advisory Committee guides the PhD student's work through the successful completion of a qualifying examination. A letter signed by the academic adviser and approved by the department head is placed in the student's file indicating the composition of the Academic Advisory Committee.

Doctoral Degree Requirements

To earn a doctoral degree in Civil Engineering, the following requirements must be met:

1. 54 credits of graduate course work (not including the PhD dissertation) in relevant major and minor areas of study beyond the bachelor's degree, with an average grade of B or better (cumulative average of 3.0 or better on a 0-4 scale). Up to 6 credits of the 54 credits may be satisfied by individual guided studies, readings, projects and theses.
2. Completion and successful defense of a 21-credit dissertation related to the major area of study. Dissertations must consist of original research that meaningfully advances the state of the art in the research subject area and should result in the publication of at least one paper in a strictly peer-reviewed technical journal related to the subject. A grade of B or better must be achieved for the dissertation. There are two types of dissertation credits:
 - CE 9998: Independent original investigation demonstrating creativity and scholarship worthy of publication in a recognized engineering journal. Registration for a minimum of 6 credits is required before registering for CE-GY 999X
 - CE-GY 999X: Independent original investigation demonstrating creativity and scholarship worthy of publication in a recognized engineering journal. Candidates must successfully defend dissertations orally. Registration for 3 to 6 credits per semester is permitted after successfully completing the doctoral qualifying examination, but a minimum of 12 credits must be completed before the defense. Registration must be continuous (excluding summer semesters), unless a formal leave of absence is requested and approved. Registration for 3 to 12 credits per semester is permitted. In the final semester of work, registration for credit is permitted with the approval of the department head. *Prerequisites: CE 9998 (6 credits), degree status, successful completion of doctoral qualifying examinations and approval of the dissertation adviser.*
3. Completion of two minor areas of study, as follows:
 - Out of Department Minor: Completion of 9 credits of graduate or undergraduate course work in one or two technical areas of study.
 - In-Department Minor: Completion of 6 credits of graduate course work in a minor area outside the major subdiscipline in civil engineering.
4. Residency requirements for the PhD in Civil Engineering include the 21-credit dissertation plus a minimum of 15 credits of applicable graduate course work taken at NYU Polytechnic School of Engineering.
5. In satisfying the 54-credit course requirement (requirement 1), the student must satisfy all requirements for the major and minor areas selected, or their equivalents.

6. In satisfying these basic PhD requirements, students also must satisfy one of the two following conditions:
 - 48 credits of relevant graduate course work, not including individual guided studies (readings, projects, theses, etc.) beyond the bachelor's degree, with an average grade of B or better (cumulative average of 3.0 or better on a 0-4 scale).
 - 24 credits of approved graduate course work, not including individual guided studies (readings, projects and theses) beyond the master's degree, with an average grade of B or better (cumulative average of 3.0 or better on a 0-4 scale). Satisfying condition 6b requires that the department accept the student's MS degree *in toto* without regard to its specific content. This acceptance requires a recommendation from the department's Graduate Committee and department head approval.
7. Although publication is not required as a condition for graduation at this time, journal publication is strongly encouraged. Every PhD candidate is expected to generate knowledge worthy of publication in two or more reputable journals.

Transfer Credits

A maximum of 39 credits of approved graduate work may be transferred. Transfer credits for PhD students may be awarded on a course-by-course basis or by the transfer of a MS degree from another institution in satisfaction of 30 graduate credits. The latter requires a recommendation from the department's Graduate Committee and the approval of the department head. Transfer credits are generally awarded at the time of admission and must be approved by the academic adviser, the graduate coordinator and the department head.

Qualifying Examination

A student must register for RE-GY 9990 PhD Examination in the semester in which the qualifying exam will be taken. This course carries no credit, and the student incurs no fees. It provides a place in the student's official transcript to record when the qualifying exam was taken and the result.

Every student pursuing a PhD must pass a qualifying examination before becoming a candidate for the PhD. The qualifying examination consists of a six-hour written portion (generally given in two three-hour blocks on the same day), and an oral portion which may be given before or after the written portion. Both written and oral portions focus on fundamental and advanced civil engineering topics relevant to the student's specific program of study.

The oral portion may also explore specific skill areas required to conduct successful independent research. Students are deemed to have passed the examination based upon an overall evaluation of both the written and oral portions of the examination.

The qualifying examination is a pass/fail milestone in the PhD process. A letter indicating the result of each examination is placed in the student's graduate file. In rare cases, a student may be deemed to have conditionally passed the qualifying exam. This may occur when the student does extremely well in all but one area. Such a student must follow a prescribed plan to strengthen his or her knowledge and skills in the weak area and pass a special examination in the weak area within one calendar year. A student who conditionally passes the qualifying exam may register for dissertation credits and may form a Dissertation Committee.

While each student will take a different qualifying examination based upon an individual program of study, the exam is considered a departmental examination. All department faculty members in each civil engineering subdiscipline may participate in submitting written problems. Each student's academic advisory committee will review the entire exam before it is administered, and may suggest changes if it deems the examination, as presented, to be an inequitable test of the student's abilities. Recommendations on examination results are submitted by each student's Academic Advisory Committee. The departmental faculty, acting as a whole, votes to accept or reject such recommendations at a meeting scheduled for this purpose. Additionally:

1. According to NYU Polytechnic School of Engineering policy, students should take the qualifying exam within their first year of study at NYU Polytechnic School of Engineering.
2. A student may take the qualifying exam twice. A third attempt is permitted only with written permission from the Academic Advisory Committee and the approval of the department head. Under no circumstances may a student take the examination more than three times.
3. No student may register for CE 999X Dissertation credits until passing the qualifying exam.
4. A Dissertation Committee cannot be formed until the student passes the qualifying exam.
5. Any student who cannot pass the qualifying exam will be disqualified from the program.

Dissertation Committee

A Dissertation Committee is formed immediately after a student passes the qualifying exam to guide the student's course of study and research work. This committee will serve as a panel of experts to aid the candidate throughout his or her research.

The Dissertation Committee shall have no less than five members, including a chairperson, a major adviser, and an adviser for each minor the student is pursuing, one of whom must be on the faculty in another NYU Polytechnic School of Engineering department. One external member who is either a faculty member at another academic institution or a noted PhD-level practitioner is encouraged. Additional faculty members may also serve on the Dissertation Committee.

The members of the Academic Advisory Committee may also serve on the Dissertation Committee. The membership of the Dissertation Committee must be approved by the department head and recorded with the Office of Graduate Academics.

The major adviser, who may also serve as chairperson, must be a full-time faculty member of the Department of Civil and Urban Engineering.

Dissertation Proposal

Upon passing the qualifying exam and the appointment of a Dissertation Committee, the PhD candidate must submit a written Dissertation Proposal outlining the subject of the proposed research. This proposal should be 15 to 20 pages long and should address the following specific items:

1. Description of the topic;
2. Literature review sufficient to ensure original work;
3. Method(s) for the research;
4. Data and/or laboratory needs and their availability; and
5. Anticipated outcomes.

The Dissertation Proposal must be submitted within one semester of full-time study after passing the qualifying exam, or before 9 credits of dissertation credit are completed.

The Dissertation Proposal is presented orally and defended before the Dissertation Committee and other interested departmental faculty. The date of the oral defense and copies of the draft Dissertation Proposal must be available to departmental faculty at least two weeks (14 calendar days) before the defense.

When the Dissertation Proposal is formally accepted and defended successfully, the chairperson of the Dissertation Committee shall enter a letter into the student's graduate file, indicating this acceptance, together with a copy of the Dissertation Proposal. While the Dissertation Committee has reasonable flexibility to modify the Dissertation Proposal during the research, any significant change in focus area or methodology requires submission of an amended Dissertation Proposal and formal acceptance as described herein.

Dissertation Defense

The culmination of the student's PhD work is the oral presentation and defense of the final draft dissertation. A defense is generally scheduled after the Dissertation Committee reviews the draft dissertation and determines that it is complete and of sufficient quality to be presented and defended.

The defense is organized and scheduled by the Dissertation Committee. All Institute faculty members may observe and ask questions at all NYU Polytechnic School of Engineering dissertation defenses. Therefore, the date of the defense must be announced Institute-wide at least one month before the event, and copies of the draft dissertation must be available to any faculty member who requests one in a timely fashion and in no case less than two weeks before the defense.

Computer Science, Ph.D.

Requirements for PhD in Computer Science

Summary

To receive a PhD in Computer Science at the NYU Tandon School of Engineering, a student must:

- satisfy a breadth course requirement, intended to ensure broad knowledge of computer science,
- satisfy a depth requirement, consisting of an oral qualifying exam presentation with a written report, to ensure the student's ability to do research,
- submit a written thesis proposal and make an oral presentation about the proposal,
- write a PhD thesis that must be approved by a dissertation guidance committee and present an oral thesis defense, and
- satisfy all requirements for the PhD degree, as described in the NYU Tandon School of Engineering bulletin, including graduate study duration, credit points, GPA, and time-to-degree requirements.

Upon entering the program, each student will be assigned an advisor who will guide them in formulating an individual study plan directing their course choice for the first two years. The department will hold an annual PhD Student Assessment Meeting, in which all PhD students will be formally reviewed.

1. Credits Requirements and Transfer Credits

In order to obtain a PhD degree, a student must complete a minimum of 75 credits of graduate work beyond the BS degree, including at least 21 credits of dissertation. A Master of Science in Computer Science may be transferred as 30 credits without taking individual courses into consideration. Other graduate coursework in Computer Science may be transferred on a course-by-course basis. Graduate coursework in areas other than Computer Science can be transferred on a course-by-course basis with approval of the PhD Committee (PHDC). The NYU Tandon School of Engineering places some limits on the number and types of transfer credits that are available. Applications for transfer credits must be submitted for consideration before the end of the first semester of matriculation. Further details can be found in the NYU Tandon School of Engineering bulletin.

2. Individual Study Plan

Each incoming PhD student will be assigned to a research advisor, or to an interim advisor, who will provide academic advising until the student has a research advisor. The advisor will meet with the student when the student enters the program to guide the student in formulating an Individual Study Plan. The purpose of the plan is to guide the student's course choice for the first two years in the program and to ensure that the student meets the breadth requirements. The plan may also specify additional courses to be taken by the student in order to acquire necessary background and expertise. Subsequent changes to the plan must be approved by the advisor.

3. Breadth Requirement

Each PhD student must complete a breadth requirement consisting of 6 courses. To remain in good academic standing, students must fulfill the breadth requirement within 24 months of entering the PhD program.

Students who do not fulfill the breadth requirement within 24 months will be dismissed from the program, unless an exception is granted by the PHDC. The PHDC will consult with the student's research advisor to decide whether an exception is granted and to determine the conditions the student needs to meet.

Details of Breadth Requirement

The courses used to fulfill the breadth requirement must satisfy the following:

(a) Approved list courses: At least 4 of the courses must be taken from the approved list of courses given in the appendix. The 4 courses must satisfy the following two requirements:

i) Theory requirement: At least one of the 4 courses must be taken in the Theory area.

ii) Systems & Applications Requirement: At least two of the 4 courses must be taken in Systems & Applications.

Exemptions from approved list courses: Students who have previously received a grade of A or A- in a graduate course similar to one on the approved list, while enrolled in a graduate program at a university with standards comparable to those at NYU, can use that course in lieu of taking the course on the approved list. The determination of whether a previously taken course can be used in this way will be made by the PHDC. However, any student who uses courses taken in another university to fulfill one or both of the Systems & Applications course requirements must work on a medium-size or larger software project at NYU. This project can be part of coursework or the student's research. A brief report on the project must be produced and approved by the PHDC.

Approved Course List: The list of approved courses will be reviewed regularly by the PHDC and is subject to change. Any changes must be approved by the CSE Department. In order for a course to be considered for inclusion in the list, the course must be rigorous and the students in it must be evaluated individually. Examples of inappropriate courses include those in which students are traditionally not differentially evaluated (e.g., all students receive A's or "pass") and courses in which grades are based on attendance or making a presentation of someone else's work, rather than on tests and assignments.

Students, under their advisors' guidance, should select their courses from the approved list so that they are exposed to a broad set of topics in computer science.

(b) Free choice courses: Students must take 2 free choice courses in addition to the 4 required courses from the approved list. Students can use any graduate course at NYU as free choice courses, but must obtain advisor approval to use a course not on the approved list. Students cannot use independent study courses (such as Advanced Project CS-GY 9963 or Readings in Computer Science, CS-GY 9413 and CS-GY 9423) or dissertation. No exemptions are available for free choice courses.

(c) GPA requirement: Students must receive a grade of at least B in each of the six courses used to fulfill the breadth requirement. The average in the 4 approved list courses used to fulfill the breadth requirement must be at least 3.5. (For students who receive exemptions allowing them to take fewer than 4 approved list courses, the average will be calculated over those courses.) The average in the 2 free choice courses must also be at least 3.5.

(d) Requirement for Students who have never taken an Algorithms Course: Any student who has not taken a course in Algorithms prior to entering the PhD program, at either the undergraduate or the graduate level, must take a graduate course in algorithms while in the PhD program. Students may take CS-GY 6033 (Design and Analysis of Algorithms I), CS-GY 6043 (Design and Analysis of Algorithms II), or CSCI-GA.3520 (Honors Analysis of Algorithms) to fulfill this requirement. The department may revise this list in the future depending on course offerings. Alternatively, students may petition the PHDC to use another course. The grade received in the course must be at least B.

Certification of Completion of Breadth Requirement

Once a student has fulfilled the breadth requirements, the student must fill out a Completion of Breadth Requirement form, listing the 6 courses taken to fulfill the requirement and specifying which ones are being used to meet the Theory requirement and the Systems & Applications requirement. Documentation for exemptions, if any, must be included. The student's advisor will verify that the breadth requirement rules were followed before signing the form. It is the student's responsibility to submit a Completion of Breadth Requirement form, with documentation of any exemptions, to the PHDC chair or designated assistant by the beginning of the semester that follows the student's completion of the breadth requirement.

4. Depth Requirement

By the end of a student's third semester in the program, at the latest, the student must be involved in a research project under the guidance of a faculty research advisor. It is the responsibility of each student to find a faculty advisor and a research project, and to inform the PHDC Chair about his/her choice of advisor. Students must inform the PHDC chair if they change their research advisor.

To satisfy the depth requirement, students must take a qualifying exam (QE) based on their research. The QE must be taken before the start of the student's fifth semester in the program. Students are required to form a QE committee, select an exam topic, and a tentative date approved by the advisor and committee, by the end of their third semester.

The QE committee must consist of the advisor and at least two other members. The committee must be approved by the advisor and the PHDC. The advisor is the designated chair of the committee. All members of the QE committee must be CSE faculty, faculty from other departments at NYU, or individuals of like standing from outside the university. At least two of the QE committee members must be tenured or tenure-track members of the CSE department, unless permission is obtained from the PHDC to include only one such member.

For the QE, the student must give an oral presentation of her/his research accomplishments to the QE committee and write a detailed document describing those accomplishments. The document must be submitted to the QE committee and the PHDC no later than one week before the oral presentation. A student is expected to have conducted original research by the time of the exam. This research may have been carried out independently or in collaboration with faculty, research staff, or other students. Students are encouraged, but not required, to have publication-worthy results by the time of the exam. It is not sufficient for a student to present a survey of previous work in an area or a reimplementation of algorithms, techniques, or systems developed by others.

The committee, by majority vote, gives a grade for the exam as one of “PhD Pass”, “MS Pass”, or “Fail.” The chair of the QE committee will send this grade in writing to the student and to the PHDC chair, together with a written evaluation of the student’s performance, approved by the QE committee members. A student who does not receive a “PhD pass” may request permission from the PHDC to retake the exam. The PHDC will consult with the QE committee, review the case and make the final decision as to whether a retake is allowed or not. A student may petition the PHDC to change one or more members of the QE committee, but approval of the request will be at the PHDC’s discretion.

If the request for a retake is approved, the QE committee will determine the date for the second attempt. If the student is not allowed to retake the exam, the student will not be allowed to continue in the PhD program in the following semester. If the student does not pass the qualifying exam on the second attempt, or otherwise does not satisfy the conditions given to her/him upon failing the exam the first time, the student will not be allowed to continue in the PhD program in the following semester.

Students that receive a “PhD Pass” or “MS Pass” have the option to obtain an MS degree.

To receive an MS degree in the course of PhD studies, a student must:

1. Complete 30 credit hours at NYU not used toward any other degree. A GPA of 3.0 or better must be achieved.
2. Satisfy the breadth requirement described above.
3. Receive either an MS or PhD pass on the QE.
4. Students may earn no more than a combined total of 9 credits of project, guided studies, readings, or thesis toward fulfillment of the MS degree requirements.

If a student has passed the QE and then changes his/her area of research, the student need not retake the QE.

Part-time students can petition the PHDC for extensions to the deadlines associated with the qualifying exam. Extensions should be for at most 2 semesters, except in extraordinary cases. Approval of extensions is at the discretion of the PHDC.

5. Thesis Proposal and Presentation

Within 6 months of passing the QE, each student is required to form a dissertation guidance committee. This committee must be approved by the student's research advisor and by the PHDC. The committee must include at least four members. The committee members can be CSE faculty, faculty from other departments at NYU, or individuals of like standing from outside the university. At least one member of the dissertation guidance committee must be a tenured or tenure-track CSE faculty member, and at least one member of the committee must be from outside the CSE department.

By the end of the student's fifth semester in the program, the student and committee must set a tentative date for the thesis proposal presentation. The presentation must be done prior to the start of the student's seventh semester in the program.

Before finalizing the date of the presentation, the student must submit a written thesis proposal to the dissertation guidance committee which should include:

- a description of the research topic
- an explanation of how the research will advance the state of the art, and
- a tentative research plan

After the dissertation guidance committee has approved the thesis proposal, the student should schedule the thesis proposal presentation and notify the PHDC chair once this has been finalized. The presentation should be announced to the faculty by the PHDC chair at least one week before it occurs. The presentation is open to all faculty. It may also be open to others at the discretion of the research advisor.

Substantial subsequent changes to the thesis topic must be approved by the dissertation guidance committee.

6. Thesis and Thesis Defense

The last, and most substantial, aspect of the PhD program is the dissertation. The research for the dissertation should be conducted in close consultation with the research advisor. When the adviser determines that the student is ready to defend the thesis, a dissertation defense will be scheduled. For the defense, the student will give an oral presentation describing the thesis research, which is open to the public. Following the oral presentation and an initial question and answer session, the dissertation committee and CSE faculty may ask the student further questions in closed session.

Other requirements for the PhD dissertation and defense can be obtained from the Office of the Associate Dean for Graduate Academics in the NYU Tandon School of Engineering.

7. Annual PhD Student Assessment Meeting

All Ph.D. students will be formally reviewed each year in a PhD Student Assessment Meeting. The review is conducted by the entire CSE faculty and includes at least the following items (in no particular order):

- All courses taken, grades received, and GPAs.
- Research productivity: publications, talks, software, systems, etc.
- Faculty input, especially from advisors and committee members.
- Student's own input.
- Cumulative history of the student's progress.

As a result of the review, each student will be placed in one of the following two categories, by vote of the faculty:

- In Good Standing: The student has performed well in the previous semester and may continue in the Ph.D. program for one more year, assuming satisfactory academic progress is maintained.
- Not in Good Standing: The student has not performed sufficiently well in the previous year. The consequences of not being in good standing will vary, and may include being placed on probation, losing RA/GA/TA funding, or not being allowed to continue in the PhD program.

Following the review, students will receive formal letters which will inform them of their standing. The letters may also make specific recommendations to the student as to what will be expected of them in the following year. A copy of each student's letter will be placed in the student's file.

8. NYU Tandon School of Engineering Requirements

Other requirements can be found in the NYU Tandon School of Engineering Bulletin. Students must meet all applicable requirements, including graduate study duration, credit points, GPA, and time-to-degree requirements.

Appendix

The following courses at NYU Tandon of Engineering can be used to satisfy the breadth requirements:

Theory

- CS-GY 6043 Design and Analysis of Algorithms II *3 Credits*
- CS-GY 6703 Computational Geometry *3 Credits*
- CS-GY 6753 Theory of Computation *3 Credits*
- CS-GY 6903 Applied Cryptography *3 Credits*

Systems & Applications

- CS-GY 6063 Software Engineering I 3 Credits
- CS-GY 6083 Principles of Database Systems 3 Credits
- CS-GY 6093 Advanced Database Systems 3 Credits
- CS-GY 6143 Computer Architecture II 3 Credits
- CS-GY 6243 Operating Systems II 3 Credits
- CS-GY 6253 Distributed Operating Systems 3 Credits
- CS-GY 6313 Information Visualization 3 Credits
- CS-GY 6413 Compiler Design and Construction 3 Credits
- CS-GY 6533 Interactive Computer Graphics 3 Credits
- CS-GY 6543 Human Computer Interaction 3 Credits
- CS-GY 6553 Game Design 3 Credits
- CS-GY 6613 Artificial Intelligence I 3 Credits
- CS-GY 6823 Network Security 3 Credits
- CS-GY 6843 Computer Networking 3 Credits
- CS-GY 6913 Web Search Engines 3 Credits
- CS-GY 6923 Machine Learning 3 Credits
- CS-GY 9163 Application Security 3 Credits
- CS-GY 9223 Selected Topics in Computer Science 3 Credits
- Only the following topics are included:
 - Social and Emotional Approaches to HCI
 - Big Data Analysis

Note

The following courses, offered by the Computer Science Department at the Courant Institute of Mathematical Sciences at NYU, can also be used to satisfy the breadth requirements:

Theory

- CSCI-GA 3520 Honors Analysis of Algorithms

Systems & Applications

- CSCI-GA.2243 High Performance Computer Architecture
- CSCI-GA.2620 Networks and Distributed Systems
- CSCI-GA.3110 Honors Programming Languages
- CSCI-GA.3130 Honors Compilers
- CSCI-GA.3250 Honors Operating Systems
- CSCI-GA.2270 Computer Graphics
- CSCI-GA.2271 Computer Vision

- CSCI-GA.2434 Advanced Database Systems
- CSCI-GA.2560 Artificial Intelligence
- CSCI-GA.2565 Machine Learning
- CSCI-GA.2566 Foundations of Machine Learning
- CSCI-GA.2590 Natural Language Processing

Electrical Engineering, Ph.D.

Requirements for the Doctor of Philosophy

General

Graduate students who have exhibited a high degree of scholastic proficiency and have given evidence of ability for conducting independent research may consider extending their goals toward the doctorate. The degree of Ph.D. is awarded after completing the program of study and research described below, and upon preparation and defense of a dissertation representing an original and significant contribution deemed worthy of publication in a recognized scientific or engineering journal.

Admission to Program

Students entering the doctoral program with a Bachelor's degree must meet the entrance requirements for the Master's program in the appropriate area of concentration. Students entering at the Master's level for the Ph.D. in Electrical Engineering program are normally expected to have a Master's in Electrical Engineering. Generally, admission to these Ph.D. programs is conditional on a student achieving a 3.5 grade point average in prior BS and MS programs. GRE is required for all applicants.

The Advisor and Academic Advisor

Many factors enter into a student's choice of an advisor for his/her research. In addition to the scientific, intellectual and personality factors which influence the pairing of student and professor, financial aspects must also be considered. For most full-time students, the ideal situation is to find an advisor who has a mutually interesting topic, as well as funds available from research grants and contracts which can support the student as a Research Assistant. A prospective student is encouraged to contact faculty members in his/her research area regarding the possibility of advising before applying to the Ph.D. program. A student who joins the Ph.D. program without securing a thesis advisor will be assigned an academic advisor, who will guide the student in terms of course selection and research activities before the qualifying exam. A Ph.D. Student must get the commitment of a faculty member in the student's area of major research interest to be the student's thesis advisor before taking the qualifying exam.

Usually, the thesis advisor is a full-time faculty member in the Electrical and Computer Engineering Department and as such is considered chair of the student's Guidance Committee. If a student wishes to have someone outside the ECE department to serve as his/her advisor, the student should submit the CV of the person and a letter of commitment from the person to serve as the advisor to the Ph.D. EE Program Director for approval. A Ph.D. in the student's proposed area of research is a nominal requirement.

Qualifying Examination

A Ph.D. student must pass the Ph.D. qualifying examination before the deadline stated below to continue in the Ph.D. program and register for Ph.D. Dissertation Credits (EL-GY 999x). A student must have completed a research project under the supervision of a project advisor before taking the exam. The student will give an oral presentation of the project during the qualifying exam and answer questions from the exam committee members, which should cover both the topic area of the project and the fundamental knowledge in the student's chosen research area. The student should have passed a certain course requirement as well as secured an ECE faculty member (or an external member approved by the Program Director) who agrees to be his/her Ph.D. advisor if the student passes the oral exam. The project advisor does not have to be the Ph.D. advisor. The prospective Ph.D. advisor is not obligated to provide financial support for the student.

Detailed information about the requirements to be satisfied before taking the qualifying exam including both course requirement, project scope and application process can be found in ECE graduate student manual, available under the ECE department webpage. Results of the exam will be recorded in the student's transcript as RE-GY 9990.

For students who started the Ph.D. program with prior MS degrees in electrical and computer engineering, the first oral exam should be taken no later than one year (two years for part-time students) after starting in the Ph.D. program. For students who started the Ph.D. program without a prior MS degree, the first oral exam should be taken no later than two years (three years for part-time students) after starting in the Ph.D. program. If a student does not meet the requirement for taking the exam by this deadline, the student will be disqualified from the program. Students who failed the first oral exam but otherwise successfully meet the requirement for taking the oral exam can repeat the exam at most once, which should be completed within one year after the first exam. Students who fail to pass the repeat exam will be disqualified from the program.

Guidance Committee

On passing the qualifying examinations, the student in consultation with the thesis advisor should identify additional members of the student's guidance committee. The committee should be composed of at least three members with the thesis advisor usually acting as Chairman. In cases where the thesis advisor is not a full-time faculty member of the Department, then a full-time faculty member of the Department must be included on the Guidance Committee and serve as chair. At least one other member of the Guidance Committee must be in the student's area of major research interest. This member may be from outside the School. The committee should include at least two ECE Tenure or Tenure Track faculty (including the advisor, and the NYUAD and NYUSH T/TT faculty), and the additional member can be other faculty members or external member with research expertise in the area. The student must submit the names of the members of his or her Guidance Committee to the Office of Graduate Academics with a copy to the ECE Graduate Office within 6 months of passing the qualifying exam. The Guidance Committee conducts the area examination, thesis defense and approves the final thesis.

Registration for Ph.D. Dissertation Credits

After passing the qualifying exams, and with the agreement of the Thesis Advisor, the Ph.D. candidate may begin registration for dissertation credits EL-GY 999x. A student must register at least 3 credits for EL-GY999x each semester. A minimum of 21 credits is required for the Ph.D. degree. The student must register for thesis continuously, every Fall and Spring semester, unless a Leave of Absence has been granted by the Office of Graduate Academics.

Area Examination

In the area exam, the student reviews the prior research in the student's chosen dissertation topic and presents preliminary research results and additional research plan. The student must submit a written report that summarizes prior research and the future plan in advance of the exam. Detailed information about the report format and submission deadline can be found in the ECE graduate student manual, available under the ECE department webpage. The area exam is conducted by the Guidance Committee, but may be open to other interested faculty and students. The Guidance Committee attends the exam and evaluates the student's performance and determines whether the student demonstrates the depth of knowledge and understanding necessary to carry out research in the chosen area. Results of the exam will be recorded in the student's transcript as EL-GY 9980.

The student must take and pass the area exam within 2 years after passing the Ph.D. qualifying exam. Students who fail to pass the exam by the deadline will be disqualified from the program.

Submission of the Thesis and Thesis Defense

Upon completion of the doctoral dissertation, the candidate undergoes an oral thesis defense. The defense is conducted by the Guidance Committee, but is open to all members of the faculty and other invited people. Dissertation copies should be made available to prospective examiners at least one week before the scheduled defense. The student should consult the Office of Graduate Studies regarding how to submit, reproduce and bind the final manuscript.

Course Requirements

A minimum of 75 credits of academic work beyond the bachelor's degree, including at least 21 Ph.D. dissertation credits taken at NYU is required. A minimum of 42 credits in formal courses (as distinct from "independent study" credits such as reading, project or thesis) are required. The chosen formal courses must satisfy the following:

1. Core Courses:

A student, in consultation with and upon approval by the Ph.D. advisor, should choose at least 4 EL courses (12 credits) among courses with numbers EL-GY 6XXX, EL-GY 7XXX, EL-GY 8XXX, as their core courses. Transferred courses cannot be used to satisfy the core course requirement. To graduate, each course must have a grade of B or above and the average grade of the four courses must be 3.5 or above. The student must have completed at least 2 such courses with the average grade of taken courses being 3.5 or above, before taking the oral qualifying exam. The remaining core courses must be completed before graduation.

2. EL Courses:

A student must choose at least 24 credits of EL courses, including the core courses. This requirement can be satisfied by the 30 credits transferred from a prior MS degree in electrical engineering or computer engineering.

3. Non-EL Courses:

A student must choose at least 2 non-EL graduate-level courses (6 credits or more) that are in either Science or Engineering discipline. These courses should be chosen from areas that are distinct and yet consonant with the student's research area. Please note courses in management cannot be counted towards this requirement. *Note that credits from CS 5000-level courses cannot be counted towards the Ph.D. EE degree.*

4. GPA Requirement:

The Ph.D. EE program requires that a student must have a GPA of 3.5 or above among all formal courses (not including dissertation or other independent studies) taken at NYU to graduate, in addition to the GPA requirement for the core courses as specified in Item 1.

5. Internships:

Up to 6 credits of approved internships (CP-GY 9941, CP-GY 9951, CP-GY 9961, CP-GY 9971, 1.5 credits each) can be applied towards the 75 credits Ph.D. degree requirement. These credits can be part of the 45 credits beyond the 30 credits of a prior MS degree, which may include up to 3 credits of approved internships for MS (CP-GY 9911, CP-GY 9921). For an internship to be approved for credits, the internship job must provide training relevant to the student's research area. All internships must be approved and supervised by the student's Ph.D. advisor. The internship supervisor should submit a midterm and a final term evaluation report to the Ph.D. advisor. The student must submit a project report to the advisor upon completion of the internship for the evaluation and grading of the internship course.

Seminar Attendance Requirement

Ph.D. students are required to register for a 0-credit Research Seminar course (EL-GY 9900) for at least 4 semesters. Satisfactory grade is given only if the student attends more than 2/3 of the seminars offered in a semester. Part-time students who have difficulty attending the seminar because of work conflict may be exempted from this requirement upon approval of the Ph.D. EE program director. The student should submit the approval note when applying for graduation.

Publication Requirement

To be granted the Ph.D. degree, a Ph.D. candidate must have at least one submitted journal paper on the thesis research subject. Documentation in the form of a letter of submission to a refereed journal, and acknowledgment of its receipt by the journal, will constitute the required evidence. If there is no accepted journal paper, the student should have at least one accepted conference paper that appeared in conference proceedings.

Transfer Credits

Ph.D. students are allowed to transfer up to 36 credits, of which 30 credits must be from a prior MS degree in ECE or a closely related field. This means that Ph.D. students admitted without a prior MS degree can transfer at most 6 credits. For the blanket transfer of 30 credits for a prior MS degree, the student must provide an official document. For individual course transfer, the student must provide an official transcript in a sealed envelop as well as catalog descriptions of the courses to be transferred, for evaluation and approval by the department graduate advisor. The official transcript and/or diploma submitted during the student's admission process can be used in place of new submission. Graduate courses taken at other schools of NYU or taken as an undergraduate student at NYU Tandon School of Engineering are exempt from this policy, but are subject to the general policy of the NYU Tandon School of Engineering regarding such courses. This policy is effective for students entering in Spring 2015 and later.

Materials Chemistry, Ph.D.

Requirements for the Doctor of Philosophy

Candidates for the degree Doctor of Philosophy in Materials Chemistry are to plan their programs in accordance with the requirements listed below.

A. Required (core) courses, 4 courses 3 credits each:

1. Physical chemistry

- CM-GY 7043 Statistical Thermodynamics and Kinetics 3 Credits

2. Organic chemistry

- CM-GY 9033 Physical Organic Chemistry 3 Credits

3. Analytical chemistry

(one of the following two)

- CM-GY 8023 Principles of Spectroscopy 3 Credits
- CM-GY 8073 Organic Spectroscopy 3 Credits

4. Inorganic chemistry, polymer chemistry, or biochemistry

(one of the following three courses)

- CM-GY 6013 Advanced Inorganic Chemistry 3 Credits
- CM-GY 9413 Biochemistry I 3 Credits
- CM-GY 7723 Synthesis of Macromolecules 3 Credits

B. Electives: 12 Credits

two courses from CM listing and two courses from CM, BE, BT or CBE listings

C. Seminar, 3 semesters: 4.5 Credits

- CM-GY 9731 Seminar in Chemistry I *1.5 Credits*
- CM-GY 9741 Seminar in Chemistry II *1.5 Credits*
- CM-GY 9751 Seminar in Chemistry III *1.5 Credits*

D. Chemical Literature: 1.5 Credits

- CM-GY 5021 Information Sources for the Chemical Sciences *1.5 Credits*

E. Chemical Colloquium: 0 Credits

- CM 9710 Chemical Colloquium

F. Chemical Laboratory Safety: 0 Credits

- CM-GY 5040 Chemical Laboratory Safety *0 Credits*

G. Thesis Research: 36 Credits (minimum)

- CM-GY 998X Research in Materials Chemistry *1-9 Credits*
- CM-GY 999X PhD Dissertation in Materials Chemistry *36 credits minimum Credits*

H. The rest, if any, are electives

(from CM, BE, BT, or CBE listings) up to 9 credits.

Total: 75 Credits

Students must pass a comprehensive qualifying examination in chemistry and present a doctoral dissertation. The qualifying exam is given once a year. Additional details on the qualifying examination should be obtained from the graduate adviser. Each candidate for the doctorate must complete a minimum of 75 credits of academic work past the bachelor's degree, including a minimum of 24 credits of dissertation research. Of those 75 credits required, at least 45 credits must be taken at NYU Tandon. If the courses transferred from another institution do not include all four core courses, the missing core courses must be taken at NYU Tandon. The remaining courses to satisfy the doctoral degree are selected in consultation with the student's adviser.

Candidates must have an overall B average in the core courses as well as in the core and elective courses (excluding seminar, chemical literature and thesis).

The student is required to declare a concentration by taking three courses from one of the following five areas: physical chemistry, organic chemistry, analytical chemistry, biochemistry and polymer chemistry. One of the three courses can be a core course. The course description indicates which courses qualify for the five areas. The GPA of the three courses must be B or better. Students must be in continuous attendance at the departmental colloquia (CM-GY 9710).

Mathematics, Ph.D.

Requirements for the Doctor of Philosophy

Requirements for the doctoral degree are primarily qualitative rather than quantitative. All student programs require approval from the guidance committee.

The number of graduate credits usually associated with the PhD in mathematics is 75 credits (course = 3 credits). The courses are to be selected from a well-balanced program in one major and two minor fields. The minor fields are encouraged to be chosen outside the Department of Mathematics, selected from such fields as Applied Mechanics, Financial Engineering, Control Theory, Computer Science, Traffic Engineering and Electrical Engineering. 51 credits of course work and at least 24 Thesis credits are required.

Required (core) courses, 12 credits, 3 credits each:

- MA-GY 7033 Linear Algebra I *3 Credits*
- MA-GY 7043 Linear Algebra II *3 Credits*
- MA-GY 6213 Elements of Real Analysis I *3 Credits*
- MA-GY 6223 Elements of Real Analysis II *3 Credits*

Note:

A grade of "A" is necessary in the required courses for PhD credit (courses may be repeated).

Only courses with grades of B or better can be used to satisfy the PhD requirements.

Students are required to pass a Part 0 written examination covering fundamental topics; a Part 1 written examination covering real and complex analysis and linear and abstract algebra; and a Part 2 oral examination on topics chosen by the student and thesis adviser.

After passing the Part 2 examination, the student writes a dissertation under the supervision of a faculty adviser.

The final requirement for the PhD degree is a public oral exam on the student's dissertation.

Mechanical Engineering, Ph.D.

Requirements for the Doctor of Philosophy

The PhD is a terminal degree beyond the MS and focuses on engineering research. Students are expected to advance the state of the art in their specialty by original and creative work. A MS in Mechanical or Aerospace Engineering or other closely related engineering or applied sciences fields is required for admission to the PhD degree program. A 3.5 GPA or better in the MS work is generally required for admission. In cases where it is unclear that the required MS specialization has been satisfied, the MS degree requirements of the preceding section will define the necessary reparation. The same criterion is used when the MS degree is in other engineering disciplines. Students with a BS degree in Mechanical or Aerospace Engineering and a GPA of 3.5 or better may apply directly for admission to the PhD program. Students have to take a written and oral departmental qualifying examination within the first two offerings of the exam after the date they join the doctoral program.

The general credit requirements for the PhD degree (beyond the BS degree and including MS degree credits) are:

	Credits
Transfer from MS degree	30
Approved course work beyond the MS degree	21 (minimum)
PhD Dissertation (ME-GY 999X)	24 (minimum)

Minimum total required	75 (minimum)
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Studies for the PhD degree must be completed in five years after the MS degree or the date of admission, whichever is later, unless a formal leave of absence is approved before the period for which the studies are interrupted.

Once the dissertation is begun (after the student passes the PhD Qualifying Exam and forms a PhD Guidance Committee), the student must register for at least 3 credits of ME-GY 999X PhD Dissertation in Mechanical Engineering each fall and spring semester. Actual registration should reflect the pace of the work and the activity of the student. An exception to the minimum registration requirement may be made in the last semester of registration if that semester is devoted primarily to complete the work and dissertation. A dissertation grade of U for two consecutive terms affects whether a student will be permitted to continue doctoral work. Students are required to present the progress in their dissertation work to their guidance committees at least once a year.

Details on the PhD degree requirements and additional requirements can be found in the departmental pamphlet on the topic.

Contact Information:

Departmental Advisers:

Iskender Sahin, iskender.sahin@nyu.edu

Maurizio Porfiri, mporfiri@nyu.edu

Technology Management, Ph.D.

Degree Requirements and Curriculum

The curriculum for the PhD-TM Program fosters a research-intensive doctoral education relevant for the rapidly emerging area of technology management. Management core courses provide a necessary foundation in management. Technology management courses expose students to the fundamental and most current research and thinking in the broadly defined technology management field. Research methods courses help students develop quantitative and qualitative research skills. Thematic elective courses help students gain in-depth knowledge in a focused thematic area related to technology management. Working together, students and doctoral advisers select which courses relate to the student's course of study in the PhD-TM Program. As part of each thematic elective course, students also take an associated thematic independent research course to investigate thoroughly previous research in the selected theme. All PhD students must undertake a doctoral research project, preferably in the second summer semester of study. This course introduces students to the requirements of management research. Finally, students work on the dissertation, an original investigation of a research question(s) related to technology management. Students are required to complete 75 credits, including 51 credits from the course work and 24 credits from the dissertation. For the most current information visit:

<http://www.poly.edu/academics/programs/technology-management-phd>.

1. Management Core Courses: 15 Credits

Management core courses should be taken as early in the program as possible. Choose five courses.

- MG-GY 6013 Organizational Behavior 3 Credits
- MG-GY 6073 Marketing 3 Credits
- MG-GY 6083 Economics 3 Credits
- MG-GY 6093 Accounting and Finance 3 Credits
- MG-GY 6303 Operations Management 3 Credits
- MG-GY 6503 Management of Information Technology and Information Systems 3 Credits

2. Technology Management Courses: 9 Credits

Choose three courses

- MG-GY 6313 Organization Theory and Design 3 Credits
- MG-GY 6543 Economics for Information Sectors 3 Credits
- MG-GY 6603 Management of New and Emerging Technologies 3 Credits
- MG-GY 8653 Managing Technological Change and Innovation 3 Credits

- MG-GY 8693 Special Topics 3 Credits

Associated Doctoral Seminars: 12 Credits

Four 3-credit doctoral seminar courses must be taken with an associated technology management course. These seminars provide strong research background required for doctoral studies in technology management.

Choose four seminars.

- MG-GY 9203 Seminar in Managing Knowledge-Workers in Innovative Organizations 3 Credits
- MG-GY 9213 Seminar in Information Systems Management 3 Credits
- MG-GY 9223 Seminar in Business Process Innovation 3 Credits
- MG-GY 9233 Seminar in Managing Technological Change and Innovation 3 Credits
- MG-GY 9243 Technology Management and Policy 3 Credits
- MG-GY 9253 Technology Strategy, Structure and Decision Making 3 Credits
- MG-GY 9263 Strategic Marketing Seminar 3 Credits
- MG-GY 9273 Doctoral Seminar in Technology Adoption and Diffusion 3 Credits
- MG-GY 9283 Doctoral Seminar on Entrepreneurship 3 Credits
- MG-GY 9293 Seminar on Content Innovation 3 Credits
- MG-GY 9303 Advanced Topics—Organizational Behavior and Organizational Theory 3 Credits
- MG-GY 9313 Introduction to Behavioral Sciences 3 Credits
- MG-GY 9323 Special Topics 3 Credits

Note:

Doctoral seminars are offered on a rotating basis. Not all the course options are available to all PhD-TM students during their study.

3. Research Methods Courses: 12 Credits

Students must take all four courses.

- MG-GY 9403 Business Research Methods 3 Credits
- MG-GY 9413 Quantitative Methods Seminar I 3 Credits
- MG-GY 9233 Seminar in Managing Technological Change and Innovation 3 Credits
- MG-GY 9433 Qualitative Research Methods 3 Credits

4. Independent Research Project: 3 Credits

- MG-GY 9913 Independent Research 3 *Credits*

5. Comprehensive Examinations

Each student must successfully pass two comprehensive examinations before starting the dissertation.

Part One: This examination includes material covered in the master's-level management core and technology management courses. It can be taken after completing 30 graduate credits.

Part Two: This examination includes material from the thematic elective and associated thematic research courses, doctoral seminars and research methods courses. It can be taken after completing required course work.

Students can take both examinations together. Results are provided within one month of the examination. Students have only two chances to pass each examination.

6. Doctoral Dissertation: 24 credits

The dissertation is evaluated in two parts: Proposal Defense and Final Defense. For details, contact the PhD-TM Program academic director.

- MG-GY 999X PhD Dissertation in Technology Management 3 *Credits*

7. Research training and interaction with faculty

Every student participates in formal and informal research seminars each week with departmental faculty and visitors. All members of the program are expected to participate in formal and informal seminars each week with departmental faculty and visitors. Each student is required to present research in progress once a year and works towards publishable papers, usually with a faculty as co-author. The seminar is a key component of the student training. Participation in other research seminars and activities at the department is also required.

Students are expected to work actively with one or more faculty each year. They learn to be researchers by doing research.

8. Advising and evaluating

The TM doctoral program faculty director advises all first-year doctoral students. During their first year students have many opportunities to get to know the research interests of all departmental faculty. By the beginning of the second year, students have selected an intermediary adviser who will guide them through the comprehensive exam process and up to the thesis stage. By the middle

of the third year students will have selected a thesis adviser. Each year every student submits a statement of intellectual progress to his/her adviser. All faculty meet to review the progress of all students in a day-long meeting each year. At this time, the student's intellectual progress is reviewed and plans for the following year are considered. The results of this review include a formal letter to the student assessing the previous year's work and offering guidance for the following year's work.

9. Prerequisites

All PhD-TM students need a fundamental knowledge of probability and statistics. Students without such a background must take MG-GY 5050 Probability and Managerial Statistics. Students without any background in professional writing and communications must take JW-GY 6003 Introduction to Technical Communication or JW 6313 Proposal Writing. Students who have a master's degree or who are transferring from other institutions (or other departments within Polytechnic) are admitted based on the same qualification standards that apply to new students. For each required MS- or PhD-level course, if students have taken a similar course, they may transfer credits for the course. However, students still have to take and pass both qualifying exams. A minimum of 30 credits, including all dissertation credit, must be taken at Polytechnic. No dissertation credits from other institutions can be transferred.

All students must take the required coursework as assigned and follow the stipulated curriculum. The course work must be finished within the first three years and the dissertation thesis within the next three years. Thus, all students (full-time and part-time) must complete all work for the doctorate within six years of initiation.

Total Credits for PhD-TM Program: 75

Transportation Planning and Engineering, Ph.D.

Doctor of Philosophy in Transportation Planning and Engineering

The PhD in Transportation is a research-oriented degree intended for those whose goal is a career in basic transportation research and/or teaching at the Institute level or in private research organizations.

Goals and Objectives

The fundamental goal of the PhD in Transportation Planning and Engineering is to develop professionals with strong research skills capable of advancing the profession of transportation planning and engineering through their work. Specific objectives of the program are to provide the skills necessary to:

- develop a strong and deep fundamental knowledge about the profession of transportation planning and engineering;
- develop the knowledge and skills to perform independent fundamental research in transportation planning and engineering;
- produce fundamental research that meaningfully advances the state-of-the-art of the profession of transportation planning and engineering.

Program Requirements

Students pursuing the PhD in Transportation Planning and Engineering generally specialize in one of the following subject areas:

- Transportation planning
- Traffic engineering
- Intelligent transportation systems
- Transportation safety

Other focus areas are possible and can be developed with the help of faculty advisers. All subject areas, of course, must be relevant to the degree sought and have a faculty member willing and able to guide the student's research.

Program Administration

All graduate applications are processed through the civil engineering departmental office, which distributes applications to the graduate coordinator. Graduate program coordinators formally implement admission decisions, in accordance with departmental regulations.

The graduate coordinators consult with the departmental Graduate Committee. All PhD applications are reviewed by the committee, and admissions decisions are made by the committee and implemented by the graduate coordinator.

For each registration, the student's program must be approved by their individual academic adviser .

Admission Criteria to PhD Program

Admission to the PhD in Transportation Planning and Engineering requires an MS in Transportation Planning and Engineering or equivalent, with a GPA of 3.5 or better (on a 0-4 scale).

All applicants are required to submit GRE scores for consideration. Foreign applicants must take the TOEFL examination and submit the results for consideration.

The "equivalent" of the MS degree can be achieved in several ways. The candidate may have an MS degree with a different title that covers substantially the same material. More generally, applicants must demonstrate that they have the equivalent of all undergraduate and master's level course work in order to pursue doctoral level work in the major area. Further, "equivalence" is evaluated based on the totality of the student's undergraduate and graduate record, not course-by-course.

Because admission to a PhD program requires a related MS (or equivalent), those applicants who have not yet achieved a master's degree would normally be admitted as MS students. They are expected to earn an MS degree while completing their major and minor course requirements. In rare cases, an applicant with only a BS degree may be directly admitted into the PhD program with the written approval of the department head and will be required to take all courses needed for the MS degree with an overall GPA of 3.5.

Doctoral Committees

Upon admission, every PhD student is assigned an academic adviser, who is selected by the PhD committee. Any member of the civil engineering faculty can be an academic adviser to a graduate student. In cases where a student is supported on a research contract, the principal investigator of the contract would normally be appointed as the academic adviser for the student. Where a student has a particular research interest and is working with a particular faculty member, the student may request that the faculty member be appointed as academic adviser. In rare cases where a PhD student enters the program without a prior selection of a major area of study, the initial academic adviser will be the Graduate Coordinator of the transportation program.

In fulfilling their academic requirements, PhD candidates will deal with two advisory committees:

Academic Advisory Committee: The student's academic adviser works out a program of courses to fulfill major and minor requirements for the PhD. The Academic Advisory Committee generally will comprise the academic adviser and one faculty member for each minor area of study. The Academic Advisory Committee guides the PhD student's work through the successful completion of a qualifying examination. A letter signed by the academic adviser and approved by the department head is placed in the student's file, indicating the composition of the Academic Advisory Committee.

Dissertation Committee: The Dissertation Committee is formed immediately after the student passes the qualifying examination. It comprises a major adviser, a dissertation adviser and a minor adviser for each minor the student has pursued. Additional faculty members may also be on the Dissertation Committee. The Dissertation Committee may be the same as the Academic Advisory Committee, or may be different. The Dissertation Committee guides the student's course and research work after the student has passed the qualifying examination. The Dissertation Committee

must be formally assigned and approved by the department head and filed with the Office of Graduate Academics. The major adviser must be a fulltime faculty member of the Department of Civil and Urban Engineering. The major and dissertation adviser may be the same individual.

Doctoral Degree Requirements

To earn a PhD in Transportation Planning and Engineering, the following requirements must be met:

- Fifty-one credits of graduate work (not including the PhD dissertation) in relevant major and minor areas of study beyond the bachelor's degree, with an average grade of B or better (cumulative average of 3.5 or better on a 0-4 scale).
- Completion and successful defense of a 24-credit dissertation related to the major area of study. Dissertations must consist of original research that meaningfully advances the state-of-art in the subject area of the research and should result in the publication of at least one paper in a strictly peer-reviewed technical journal related to the subject. A grade of B or better must be achieved for the dissertation.
- Completion of two minor areas of study, each consisting of between 9 and 12 credits of graduate work.
- Residency requirements for the PhD in Transportation Planning and Engineering include the 24-credit dissertation. The dissertation advisor has to approve all transferred credits from other institutions.

In satisfying the 51-credit course requirement, the student must satisfy all requirements for the major and minor areas selected, or their equivalent.

In satisfying these basic PhD requirements, students must also satisfy one of the two following conditions:

- Thirty-nine credits of approved graduate course work, not including individual guided studies (readings, projects, theses, etc.) beyond the bachelor's degree, with a cumulative average of 3.5 or better on a 0-4 scale.
- Twenty-one credits of related graduate course work beyond the master's degree, with a cumulative average of 3.5 or better on a 0-4 scale.

Satisfying condition 2 requires that the department accept the student's MS degree *in toto* without regard to its specific content. This requires a recommendation from the department's Graduate Committee and the approval of the department head.

Transfer Credits

Transfer credits for PhD students can be awarded course by course. Alternatively, a MS degree from another institution may be accepted for transfer in toto. The latter requires a recommendation from the department's Graduate Committee and the approval of the department head. Transfer credits are awarded generally at the time of admission and must be approved by the academic adviser, the transportation graduate coordinator and the department head.

Qualifying Examination

Departmental qualifying examinations for the PhD in Transportation Planning and Engineering are given once a year (usually in May or June) and are coordinated with other qualifying examinations in the department. If sufficient demand exists, a second qualifying examination may be scheduled in November or December. Every PhD student must pass a qualifying examination in the major area of study and in any in-department minor areas of study before becoming a candidate for the PhD.

Further:

- No student may register for dissertation credits until the Qualifying Examination is passed.
- A Dissertation Committee cannot be formed until the student passes the Qualifying Examination.
- A student may take the Qualifying Examination twice. A third attempt is permitted only with the written recommendation of the Academic Advisory Committee and the approval of department head. In no case may a student take the examination more than three times.
- Students normally take the Qualifying Examination (for the first time) after successfully completing most of their course requirements in the major and in department minor areas of study.

The Qualifying Examination consists of a five-hour written portion and an oral portion of approximately one hour. Both written and oral portions of the examination focus on the student's major and in-department minor. The oral portion may also explore higher-level skill areas required to successfully conduct independent research. Students are deemed to have passed the examination based upon an overall evaluation of the written and oral results. While some students may not be invited to the oral examination if they have done poorly in the written portion, invitation to the orals does not imply that the student has "passed" the written portion of the exam.

The Qualifying Examination is either "passed" or "failed." A letter indicating the result of each examination is placed in the student's graduate file. In rare cases, a student may be deemed to have "conditionally passed" the Qualifying Examination. This conditional status occurs in cases where the student does extremely well in all areas except for a single subject area in which weakness has been noted. Such students must follow a prescribed plan to strengthen their knowledge and skills in the area of weakness and must pass a special examination on the area of weakness within one calendar year. A student who has "conditionally passed" the Qualifying Examination may register for dissertation credits and may form a Dissertation Committee.

All transportation faculty members participate in submitting written problems for the qualifying examination, and in the grading process and in the oral examination. All departmental faculty members are welcome to observe any oral examination and to ask pertinent questions. Each student's Academic Advisory Committee will have the opportunity to review the entire exam before it is administered and may suggest changes if it deems that the examination as presented is an inequitable test of the student's abilities. Recommendations on the results of the examination are submitted by each student's Academic Advisory Committee, augmented by any departmental faculty in the subdisciplines tested.

Dissertation Proposal

Following passage of the Qualifying Examination and the appointment of a Dissertation Committee, the PhD candidate must submit a written Dissertation Proposal, outlining the subject of the proposed research. This proposal should be between 15 and 20 pages long and should address the following specific items:

- Description of the topic
- Literature review sufficient to insure that the work contemplated is original
- Research methodology(ies) to be used
- Data and/or laboratory needs and their availability to the student
- Anticipated outcomes

The Dissertation Proposal must be submitted after one semester of registering full time for dissertation credits, or before 9 credits of dissertation credit are completed.

The Dissertation Proposal is orally presented and defended before the Dissertation Committee and other interested departmental faculty. The date of the oral defense and copies of the draft Dissertation Proposal must be made available to department faculty at least two weeks (14 calendar days) before the defense.

When the Dissertation Proposal is formally accepted, the Dissertation Adviser enters a letter into the student's graduate file, indicating this acceptance, with a copy of the proposal. While the Dissertation Committee has reasonable flexibility to modify the proposal during the research, any significant change in focus area or methodology requires that an amended Dissertation Proposal be written and formally accepted following the same procedure noted herein.

Dissertation Defense

The culmination of the student's PhD work is the oral presentation and defense of the final draft dissertation. A defense is generally scheduled after the Dissertation Committee has reviewed the draft dissertation and determined that it is complete and of sufficient quality to be presented and defended. By this time, it is also required that a paper based on the dissertation has been submitted to a peer-reviewed journal for publication, details to be worked out with the dissertation advisor.

The defense is organized and scheduled by the Dissertation Committee. All Institute faculty members are invited to observe and ask questions at all NYU SOE dissertation defenses. Therefore, the date of the defense must be announced Institute-wide at least one month before the event, and copies of the draft dissertation must be available to any faculty member requesting one in a timely fashion and in no case less than two weeks before the defense.

COURSE DESCRIPTIONS

A Brief Guide to Course Descriptions

Each program described in this catalog contains detailed descriptions of the courses offered within the program.

The first line gives the official course number for which students must register and the official course title. The letters indicate the discipline of the course and the first number of the official course numbers indicates the level of the course. The levels are as follows:

- 1XXX - Freshman Level
- 2XXX - Sophomore Level
- 3XXX - Junior Level
- 4XXX - Senior Level
- 5XXX to 9XXX - Graduate level

Typically the last number of the course number indicates the number of credits. The breakdown of periods of the course is also listed.

When selecting a course for registration, the section of the course may include the following notations:

- "LEC" - lecture section
- "RCT" or "RC" - recitation section
- "LAB" or "LB" - lab section

Additionally, any other letter or digit listed in the section will further identify the section and being linked to another section of the class with the same letter and/or digit combination. Further information on sections is available from academic advisers during registration periods.

The paragraph description briefly indicates the contents and coverage of the course. A detailed course syllabus may be available by request from the office of the offering department.

"Prerequisites" are courses (or their equivalents) that must be completed before registering for the described course. "Co-requisites" are courses taken concurrently with the described course.

The notation "Also listed..." indicates that the course is also given under the number shown. This means that two or more departments or programs sponsor the described course and that students may register under either number, usually the one representing the student's major program. Classes are jointly delivered.

REGISTRATION

During registration, students meet with their academic adviser who provides them with advisement and approves their selection of courses. Students then register themselves online via Albert and pay tuition and fees to the Office of the Bursar via eBilling, all according to published deadlines. To receive academic credit, students are required to register each semester for every course they are taking, including theses, projects and guided studies. Class attendance without registration is not permitted.

Advisement for Registration

The academic advising process is the basis for student course selection and registration. Each academic department identifies faculty or professionals who serve as advisers to the students. Before registration, students must meet with their adviser and receive approval for their anticipated program of study. Students may obtain a list of advisers and their contact information from their respective departmental offices.

To ensure that students have met with their academic advisers before registration, the Office of the Registrar places an “academic hold” on the student’s record. When students meet with their advisers, the holds are removed and students can register.

Approval to register for a course does not necessarily constitute approval to substitute that course for another course to satisfy a specific degree requirement. For example, approval to register for a guided readings course is not necessarily approval to substitute that course for another similar course prescribed in the curriculum. If the course is not normally used for that purpose, students should explicitly request such approval from the adviser. Such approval must be granted in writing and submitted to the Office of the Registrar.

Incoming first-year students may be required to take a mathematics diagnostic and/or English placement exam. These exams are free and used solely for advisement and course placement.

Registering for Classes

The NYU School of Engineering offers two registration periods for each semester (detailed below). New freshmen entering in the fall semester register during the summer preceding their arrival on campus. New students and special students receive registration information from the Office of Undergraduate Admissions or the Graduate Center.

Regular Registration

All continuing, degree-seeking students (graduate and undergraduate) are expected to register for the next semester during the latter part of each ongoing semester. All students must take advantage of regular registration via Albert, the student online registration system. All students are encouraged to enroll early in the registration period to avoid being closed out of required courses. Registration dates for each semester are published by the Office of the Registrar. Payment of tuition and fees, or arrangement for payment, is due to the Office of the Bursar no later than the published deadline.

Late Registration and Add/Drop

The Late Registration period begins during the second week of the term and ends on the published Add/Drop Deadline. A late fee is assessed to all continuing students who register during this Late Registration period. Payment of tuition and fees is due on the same day as registration during the Late Registration period. Students who do not complete registration by the end of the Late Registration and Add/Drop period will not be registered for that semester. After the Add/Drop Deadline, students seeking to register need to obtain special permission from the respective Associate Dean in addition to the course instructor(s) and/or department(s). Such exceptions are rarely permitted, and must be submitted to the Office of the Registrar with the appropriate paperwork and signature approvals.

Additions or deletions to a student course schedule may be made according to the deadlines published in the Registration Calendar. These adjustments should be made online through Albert. A course dropped after the third week of classes is considered a Withdrawal, and such courses will remain on the student's transcript with a grade of "W" (which has no GPA penalty). Withdrawals should also be processed in paper by the Office of the Registrar.

If a student drops or withdraws from a course, tuition charges are adjusted according to the Refund/Tuition Liability schedule published by the Office of the Bursar.

STUDENT SERVICES

Wasserman Center for Career Development | Brooklyn

The Wasserman Center for Career Development | Brooklyn will connect you with leading companies that are searching for highly skilled, market-ready individuals prepared to take on the challenges and opportunities of the 21st century. Our offices help undergraduate and graduate students seek positions where their refined technical, analytical and communication skills can best be put to use.

Career Counseling and Career Development Seminars

Knowing how to conduct an internship or job search is key to landing the opportunity you want. Through one-on-one career counseling and group seminars, NYU School of Engineering students acquire effective job search skills designed to complement their successful in-classroom experiences. Writing an effective resume, preparing for a career fair and acing the interview are just some of the topics addressed by career center staff.

Internship Opportunities

Internships allow students to gain real-world experience, while giving employers a chance to identify future talent. Students are encouraged to participate in one or more internships before they graduate, demonstrating to employers NYU School of Engineering's high standards of excellence. These professional experiences give students an edge over the competition and have the potential to turn into full-time opportunities following graduation.

NYU CareerNet, Career Fairs and On-Campus Recruiting

NYU School of Engineering students can connect to NYU CareerNet, our online internship and job search engine. Using this valuable database, students can submit a cover letter and resume directly to employers. Additionally, internship and job seekers can meet with hiring companies at career fairs and even arrange on-campus interviews with these employers. Participating companies range from small entrepreneurial start-ups to mid-sized businesses to internationally recognized major corporations.

Counseling and Wellness Services

"Helping Students Achieve Maximum Potential"

Counseling and Wellness Services offers free, confidential psychological services to all NYU School of Engineering students. College can be a stressful time, and students can face a range of difficulties that can interfere with their ability to succeed academically or function at their best. For example, many students struggle with concentration, test anxiety, sadness, lack of motivation and difficulties with family or friends that can interfere with their NYU School of Engineering experience. The Counseling and Wellness Services staff is available to meet with students and help resolve these issues. Staff members provide information and support to help students solve problems, achieve goals and feel better.

Students can make an appointment by calling (718) 260-3456 or stopping by the center at 232 Dibner.

Counseling and Wellness Services is open Monday through Friday, 9 a.m. to 5 p.m. Additionally, the NYU Wellness Exchange operates a 24-hour hotline at 212-443-9999.

Throughout the year, Counseling and Wellness Services offers workshops on meditation, stress reduction, relationships and getting a good night's sleep. Workshops are advertised on the Counseling and Wellness Services website, in the NYU School of Engineering calendar, and through campus e-mail blasts.

For more information about Counseling and Wellness Services and its services, visit our website.

Updated information on participation in NYU sponsored activities and services is available on the website.

Services for Students with Disabilities [Moses Center]

NYU Polytechnic School of Engineering is committed to providing equal educational opportunity and participation for students with disabilities. It is the University's policy that no qualified student with a disability be excluded from participating in any University program or activity, denied the benefits of any University program or activity, or otherwise subjected to discrimination with regard to any University program or activity.

The mission of the Moses Center for Students with Disabilities (CSD) is to facilitate equal access to programs and services for students with disabilities throughout the schools and divisions of New York University (NYU) and to foster independent decision making skills necessary for personal and academic success. Accommodations for students with disabilities do not include the waiving of academic course requirements.

Students with disabilities are encouraged to register with the Moses Center for Students with Disabilities (CSD) whether or not services are requested. Students can request services by meeting with Disability Specialist, Sonia Ajwani (sonia.ajwani@nyu.edu) and submitting supporting documentation. Visit the NYU Moses Center website for more details.

Advocacy and Compliance [Office of Student Affairs]

Student Advocacy

The Office of Student Affairs plays a vital role in supporting and encouraging students who are faced with challenging situations during their student careers. It is one of several places where students can get confidential help. As a student advocate, Judith Simonsen, Coordinator of Advocacy and Compliance, works with various other offices to help students solve problems and develop self-advocacy skills.

Absence Notification to Faculty

It is important for instructors to know when you are experiencing an issue that might interfere with your studies. However, it is also important that your personal matters be kept confidential. Therefore, the Office of Student Affairs is the office designated to receive documentation regarding private

concerns. An official verification notice must be sent to instructors, but this notice does not share personal details.

- Death in the family
- Medical conditions and illnesses

If illness or an accident causes you to miss a class (or classes) or an exam, you should do the following:

- Notify your Professor by email of your absence, the reason for it, and how long you think you may be away.
- Obtain medical documentation and when you are back on campus come to see Judith Simonsen in Dibner Hall Room LC 240C. Judith Simonsen can be reached by email at js6244@nyu.edu.

When you have missed an exam, or in the case of a prolonged absence, please check your paperwork before leaving your doctor's office, and be sure it includes a diagnosis, and an estimate of the length of your absence. Without proper documentation Ms. Simonsen will not be able to intervene on your behalf.

- Do not provide anyone except this office with a copy of your paperwork. If a professor requests a copy, refer them to Ms. Simonsen. This is to protect the confidentiality of your medical information

Student Religious Observance

View NYU's policy regarding observing religious holidays [here](#).

The School of Engineering's policy requires students to provide Ms. Simonsen with written notification 15 days in advance of the days to be taken off, as well as the e-mail contact for your professors, so they can be given notice of the absence.

International Students and Scholars

Graduate and undergraduate international students come from more than 60 countries, make up 40 percent of the student body and are an integral part of the NYU School of Engineering community. All new international students and visiting scholars (researchers and faculty) are required to report with immigration documents, including I-20s, DS-2019s and passports, to the Office of International Students and Scholars (OISS) immediately upon arrival. In addition, all new students and scholars must attend a mandatory orientation held at the start of every semester.

The office provides information and counseling regarding immigration compliance, travel, employment, acculturation, housing, health insurance and special events. International students, researchers and faculty may contact the office in person, by email, or by telephone, and are encouraged to attend on-site workshops offered at designated times during the academic year. All international students, research scholars and faculty are required to carry health insurance.

For additional information on admissions and academic requirements, please consult those sections dealing with undergraduate and graduate admissions and academic programs and policies.

Study Abroad

The opportunity to study abroad provides students a chance to experience life in countries rich in history, culture and accomplishment. Immersion experience in another culture strengthens understanding of the world and appreciation of international contribution to knowledge. It offers an opportunity to learn how to cope in international environment and communicate across barriers of language, custom, geography and politics. Skills developed during this experience add an invaluable dimension to the quality of a well-rounded education that ultimately enhances professional and personal endeavors in the developing global community.

Students may apply for short-term study, a semester, or a full academic year abroad. Students may select from one of 50 institutions around the world with which NYU School of Engineering has direct-exchange agreements, as well as NYU Study Abroad sites.

Participation in the study-abroad program is open to undergraduate and graduate students. Undergraduate students are eligible after one year of academic study so long as they maintain a 2.5 GPA. While these are the minimum NYU School of Engineering requirements to participate in the program, host institutions will make their own determinations about admissibility.

Academic credits earned during study abroad are transferable to NYU School of Engineering and may be applied to degree requirements subject to school policies and the approval of the student's major department. For additional information contact OISS.

Programs and Services for the First-Year Students

Freshman Programs

The School is committed to improving the persistence and performance of first-year students by helping them to acclimate to their intended academic discipline, its associative culture and student life at the NYU Tandon School of Engineering. Achieving this goal requires diverse and dynamic collaborative efforts with constituencies across the campus community. These systemic partnerships yield a greater sense of cohesion to the programs and services for first-year students.

Programs and services in this area include first-year advisement, early alert and academic probation initiatives, first-year instructors meetings, and parent outreach.

Academic Advising Center

The mission of the Academic Advisement Center (AAC) is to provide centralized advising for incoming, matriculated first-year students. The staff advises students on major requirements and School regulations and refers them to campus resources. In addition, academic advisers advocate for students with NYU Tandon School of Engineering offices and help students deal with issues. The ultimate goal of the AAC is to empower students to make informed decisions about their academic careers.

Early Alert and Academic Probation

Each semester requests are sent to first-year instructors asking for feedback on their students' academic progress. Students at risk of not passing their course(s), based on their current progress, are notified of their academic status and encouraged to meet with their instructor(s) and academic

adviser to remedy the situation. At these meetings, students have the opportunity to think critically about the behaviors contributing to their status, while being invited to take advantage of the various support services to help them maximize their academic experiences.

All first-year, first-time probationary students must register for and pass SL 1020 Academic Skills Seminar. The course consists of eight one-hour sessions, which meet once a week, and is taught on a pass/fail basis. The seminar helps students learn to become more academically successful. The “Academic Probation” section of the catalog contains more information about this course.

Parent Outreach

Educating parents on the academic experiences of first-year students is a critical step in forming an effective partnership between the School and family members. Participating in University-wide parent gatherings, along with the individual meetings that happen over the course of the academic year, provide family members with an opportunity to speak directly with faculty, administrators and students about the majors and support services available to students.

New Student Orientation

The NYU Tandon School of Engineering seeks to ease new students’ transition to their new educational environment with a variety of programs that orient and welcome new students every semester. These programs are housed under the New Student Orientation (NSO) umbrella, and are a result of the collaborative efforts between Student and Academic Affairs. NSO programming covers a broad array of topics that not only help students gain a better understanding of student life in academic and social spaces, but also signals to the School the arrival of the newest members to the community.

Residence Life & Housing Services

The Office of Residential Life and Housing Services exists to provide quality service and enhance student success in a safe and diverse living/learning community that fosters individual growth.

Our residence halls are an extension of the classroom; we seek to provide experiences that will help our residents develop into global citizen. We are committed to providing our students with an inclusive, healthy and welcoming home.

Campus housing is available for all students. NYU School of Engineering does not provide housing for students’ families. Inquiries about campus housing should be made to the Office of Residence Life and Housing Services at (718) 260-4160.

Campus Housing Facility

On the Brooklyn campus, the Donald F. and Mildred Topp Othmer Residence Hall is a 20-story building that houses more than 400 students in two-bedroom suites and two-bedroom apartments with kitchenettes. Each room has Internet and cable TV ports. This innovative building is wireless and includes student lounges, study rooms, laundry facilities, outdoor space and 24-hour security. Two full-time professional residence-life staff members work with graduate and undergraduate student resident assistants and security personnel.

The Clark Residence is connected to the St. George Residence - Weller Building and Studio Building - and occupies the site of the former St. George Hotel in one of New York City's most desirable neighborhoods, Brooklyn Heights. Just one subway stop from lower Manhattan, the Clark Residence is within walking distance to NYU School of Engineering's MetroTech campus, shopping, dining on Montague Street and a short walk to the Brooklyn Promenade, home to breathtaking views of the Manhattan skyline.

Each single, double and triple fully-furnished room in the Clark Residence offers a TV, DVD player, high-speed internet, refrigerator, microwave and bathroom. The residence features lounges, a pool table, public computers, communal kitchens and a complimentary membership to the four-star Eastern Athletic Club.

Campus Housing Requirements

All students living on-campus are required to be full-time NYU School of Engineering students and Othmer residents are required to be on the School meal plan. For security purposes, all resident students are mandated to have a cell phone and sign-up for the Emergency Text Alert system (E2campus).

Student Affairs: Activities, Advocacy, Leadership

Office of Student Affairs

The Office of Student Affairs is concerned with the holistic education and development of all NYU Tandon students, inside and outside the classroom. The office helps students to assemble their educational, personal and professional development puzzle-from orientation to commencement. All of the departments within the office provide a variety of programs and support that enhance the first-year student transition, develop student leadership excellence, promote campus community citizenship, foster campus-wide diversity awareness and provide general student advocacy.

New Student Programs

The NYU Tandon School of Engineering seeks to ease the transition for students into their new environment with a variety of programs designed to orient and welcome new students. These programs are generally held before the fall and spring semesters.

New Student Orientation (NSO)

Orientation is designed by various offices throughout the School and student Orientation Leaders to welcome all new students to the Tandon community and introduce them to the various campus offices, programs and resources that lead to student success.

New Student Orientation introduces new students to the School of Engineering community and offers opportunities for incoming first-year and transfer students to complete their enrollment activities well before classes begin. Students will receive the information and tools needed to successfully acclimate to NYU Tandon, and become an active member of the academic community. Orientation programs are designed around the objectives of familiarizing students with their intended major; increasing understanding of the first-year curriculum and its connection to the academic discipline; and familiarizing new students with critical on-campus first-year support networks.

The overall goal is to create a sense of excitement and enthusiasm around the students' majors, while demystifying preconceived notions about majors and college life. The program is coordinated by a team of administrators, faculty and students who welcome new students to the Tandon community.

New Student Convocation

New Student Convocation is the first major academic program new students experience as members of the NYU Tandon School of Engineering community. At convocation, new students are inducted into the School's academic community and are introduced to a variety of speakers and university administrators. The convocation is the official kick-off of the week-long orientation for all new students.

Orientation Leader Program

The Orientation Leader Program is comprised of upper-level, enthusiastic student volunteers who want to share their love of the NYU Tandon School of Engineering with new students. Orientation Leaders (OLs) are selected during the spring semester and are trained to run new student orientation programs.

Office of Student Activities and Resource Center

Student Activities is a part of the Office of Student Affairs and is focused on the holistic education and development of all NYU Tandon students, inside and outside of the classroom. The department helps students to assemble their educational, personal, and professional development puzzle—from orientation to commencement. Student Activities provides a variety of programs and support that enhance the first-year student transition, develop student leadership excellence, promote campus community citizenship, foster campus-wide diversity awareness, and provide general student advocacy.

Student activities are an integral part of the educational process. Participation in student activities fosters the development of leadership and interpersonal skills. The NYU Tandon School of Engineering believes that student activities broaden the academic experience. The School encourages every student to take part actively in cocurricular and extracurricular student activities, which promote and produce a balanced educational experience. The Tandon website and Orgsync offers updated information on participation in NYU-sponsored activities and services.

Student Council

The NYU Tandon School of Engineering Student Council is elected by students to serve as their primary representatives, advocates, and liaisons to the entire student community. The Student Council is charged with:

- Serving as the officially designated representative of the undergraduate student body and to advocate to the administration on behalf of the student body and, when requested, provide student representatives to committees
- Coordinating major campus events in coordination with the Office of Student Affairs and enhance the educational mission of Tandon by providing social, cultural, educational, and developmental programs, events and services
- Gathering and expressing student opinions on how to improve student life and campus activities

- Ensuring that students are fully apprised of all information dealing with the impact to their undergraduate experience
- Responsibly and equitably distributing student activity fees and student organization funding
- Working with other student groups to program college-wide events designed to foster cohesiveness within the entire undergraduate population
- Assuring that all events, programs and services offered by student clubs, organizations, societies, and other groups are open to all members of the NYU School of Engineering community regardless of race, sex, religion, national origin, physical disability, sexual orientation, or age except as permitted by law
- Protecting the rights and responsibilities of the undergraduate student body and to work with other members of the NYU School of Engineering community to maintain and improve the quality of education and social experience received at NYU Tandon

For more information about Student Council, please go to:
<http://engineering.nyu.edu/life/student/leadership/student-government>.

Student Clubs and Organizations

There are more than 40 student clubs and organizations at the NYU Tandon School of Engineering. Each group is responsible for fulfilling the purposes of the organization as set forth in its constitution, charter or business plan. Student organization documents are filed with the Office of Student Activities & Resource Center and the Student Council. New groups and organizations can be created by complying with the procedures set by the Student Council. Professional and technical societies are established in conjunction with various academic departments to enhance the curricula at NYU Tandon. These student chapters are branches of national parent organizations. In chapter meetings, members hear distinguished guest speakers, plan field trips, read professional papers and work on technical projects. As a part of the clubs and organization framework under the auspices of the Student Council, these chapters are funded, in part, by student activities fees.

The NYU Tandon School of Engineering has student organizations to suit almost every interest, whether social, intellectual, religious, musical, cultural or athletic. Many of the organizations have long and distinguished histories.

For a listing of current student clubs and organizations, visit Orgsync.

Advocacy & Compliance [Office of Student Affairs]

Student Advocacy

One role of the Office of Student Affairs is to play a significant role in supporting and encouraging students who are faced with challenging situations during their student careers. As a student advocate, Judith Simonsen (js6244@nyu.edu), Coordinator of Advocacy & Compliance, assists students who are experiencing problems with their health, or who have major challenges in their lives, in their interaction with faculty, and with other departments.

Absence Notification to Faculty

Certain absences are considered to be excused absences if they are based on adequate documentation. The first is an absence based on illness. Students need to provide Judith Simonsen (js6244@nyu.edu) with their documentation and with the names of their professors and the numbers

of the courses for the days missed. Faculty will receive notice of illness. Absences may also be based on the illness of a close family member, which then must be documented in the same manner. Absence based on personal travel is not excused. In the case of final exams, failure to attend and take the exam may result in a failing grade. Professors may demand documentation that requires a medical absence for the day of the exam, in order for the absence to be excused.

Student Religious Observance

Students who wish to take days of religious observances should notify the Coordinator of Student Advocacy & Compliance, Judith Simonsen (js6244@nyu.edu), at least ten days in advance, of the days to be taken, along with the names of the professors of missed classes, and their class numbers, so that the notice can be given. Students remain responsible for work missed. Please check <https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/university-calendar-policy-on-religious-holidays.html>.

Conduct Compliance

Issues involving behavioral misconduct are referred to the Office of Community Standards, Thomas Grace. Please check the Student Community Standards at <https://www.nyu.edu/students/student-information-and-resources/student-community-standards.html>.

Issues of academic misconduct are handled initially by individual departments on campus. Please check the student Code of Conduct at: <http://engineering.nyu.edu/life/student-affairs/code-of-conduct>.

ACADEMIC SUCCESS, ADVISING AND TUTORING SERVICES

Freshman Programs

The School is committed to improving the persistence and performance of first-year students by helping them to acclimate to their academic discipline, its associative culture and student life. The office is the primary contact for first-year student issues and offers diverse and dynamic collaborative efforts with constituencies across the campus community. These partnerships provide a great sense of cohesion to the programs and services that meet the needs of first-year students. Programs and services offered include first-year advisement, early alert and academic probation initiatives, first-year instructors meetings, and parent outreach. (See Section on “Programs and Services for the First-Year Students” for an expanded description of the programs and services in this area.)

Academic Advisement Center

The mission of the Academic Advisement Center (AAC) is to provide centralized advising for all incoming, matriculated first-year students, empowering them to make informed decisions about their academic careers. The staff advises students on major requirements and School regulations and refers them to campus resources. In addition, academic advisers advocate for students with NYU Tandon School of Engineering offices and help students deal with issues affecting them. Students are assigned advisers in their major departments after the first year.

Students may make an appointment or drop in to see their adviser. Advisement sessions cover an array of topics, including major requirements, School regulations and life-skills development. The center refers students to campus resources for additional support and guidance in an effort to address any School related issues affecting them. In addition, academic advisers advocate for first-year students with the offices of the Registrar, Financial Aid, Student Accounts and Admissions, as well as other offices.

In conjunction with the Office of Academic Affairs, the center assists with the review of first-year students' progress to determine academic standing. Students on probation are directed to meet regularly with their advisers to discuss their situation and learn how to make improvements to return to good academic standing. All first-year, first-time probationary students must enroll in and attend SL 1020, Academic Skills Seminar.

For more information about the center, visit <http://engineering.nyu.edu/academics/support/academic>.

Office of Academic Affairs

The office reviews all undergraduate students' progress each semester to determine academic standing. Decisions are made on eligibility for the Dean's List, academic probation, disqualification and appeals of academic disqualifications. Notifications for all academic actions are e-mailed to students and their academic departments and School support offices.

This office also coordinates evaluations of transfer credits in cooperation with the Office of Admissions and academic departments. The Office of Academic Affairs also serves as liaison

between the Office of Undergraduate Academics and undergraduate advisers to ensure uniformity of advising practices. The staff also assists the Dean with articulation agreements with other universities.

TRIO Scholars Program

TRIO is a series of federal programs designed to create educational opportunities for disadvantaged students, aimed at their successful progression through, and completion of, their postsecondary career. In terms of its categorization on the TRIO spectrum, NYU Tandon School of Engineering's program is a Student Support Service Project, and is referred to as the TRIO Scholars Program. The mission of the program is to provide high quality, holistic support services to first-generation college students, modest-income students, and students with disabilities pursuing a baccalaureate degree at the NYU Tandon School of Engineering in order to help them reach their full academic potential, persist, and graduate from the University.

The services provided by the TRIO Scholars Program are broad, personalized and are adapted and adjusted to meet students' needs as they progress through the academic continuum. The services provided include:

ACADEMIC COACHING:

Each TRIO Scholar is assigned to a TRIO staff member whom they meet with on a monthly basis. Staff members work with students to: build on strengths; identify any potential barriers to success; determine a plan for development in identified areas for growth; develop healthy coping and problem-solving skills; and stay on track towards graduation.

INDIVIDUALIZED TUTORING:

TRIO Scholars receive individualized tutoring in the course(s) they request. Tutors are provided to students in chemistry, biology, math, physics, computer science, and other courses. These structured, weekly, hourlong sessions offer an opportunity for students to deepen their understanding of course material and have their specific questions answered. Small-group clinic hours and weekly review sessions, study aids, instructional software, and other academic resources are also available through the program.

ACADEMIC COUNSELING:

Academic counseling is available to help students manage the academic challenges of university life. The counseling component of the TRIO Scholars Program includes individual study skills advisement, financial aid counseling, major and career exploration, health and wellness counseling, and limited personal counseling. The counselor on staff assist students with mastering the technical curriculum at NYU Tandon School of Engineering, and any concerns which may be affecting students' academic and/or personal success.

SOCIAL INTEGRATION ACTIVITIES:

The program schedules cultural and educational workshops and trips throughout the academic year. All events are geared towards the academic and personal development of TRIO Scholars.

FINANCIAL ASSISTANCE:

The TRIO Scholars Program provides eligible TRIO Scholars with limited financial assistance through grants and scholarships.

For more information about the TRIO Scholars Program, visit <http://engineering.nyu.edu/academics/support/trio-scholars-program>.

Polytechnic Tutoring Center (PTC)

Mission: The Polytechnic Tutoring Center (PTC) is committed to offering superior tutorial service in multiple first and second year subject areas by staying current with the best tutoring methodologies and technologies. We are dedicated to hiring and training well-qualified undergraduate peer tutors as well as professional writing consultants. The Polytechnic Tutoring Center maintains a caring, supportive, and encouraging academic support service to the NYU Tandon School of Engineering community. We measure ourselves by how all NYU students are prepared to excel. The Polytechnic Tutoring Center continues to engage in partnerships across the School to develop other tutoring strategies, including but not limited to group tutoring, mid-term and final reviews, study skills workshops, and workshops on various aspects of effective written and oral communication.

Vision: The Polytechnic Tutoring Center is committed to the overall academic excellence of the NYU Tandon School of Engineering. The Polytechnic Tutoring Center enhances the academic experience of all students by partnering with committed faculty and well-trained peer and professional tutors to support students as they achieve academic success.

The Polytechnic Tutoring Center (PTC) offers a range of academic support services to all registered students. Tutoring is offered for the biology, chemistry, computer science and physics courses for first- and second-year students. Tutoring is provided on a drop-in basis as well as through exam-review sessions.

The PTC also includes the Writing Center, where students receive help with college-level writing, reading and speaking assignments and with English-language mastery. The Writing Center is open to NYU Tandon students at any level, from first-year undergraduates through doctoral candidates. Writing Center staff work with students individually and in small groups.

Tutors are carefully selected and trained. They include undergraduate peer tutors, graduate students and instructors. Tutors know their subjects well and understand where students may have difficulty. They are skilled at explaining material in a variety of ways for maximum comprehension. All students' questions are respected; no question is too basic to ask. The PTC also helps students improve their learning skills in order to become more successful in college and throughout their careers.

PTC services are free of charge. For more information about the center, visit polytechnictutoring@nyu.edu.

SPECIAL PROGRAMS

General Studies (GS) Program

About

The General Studies (GS) Program provides proactive support for students, allowing them an opportunity to matriculate and successfully obtain a science, engineering, humanities, and management based education. To encourage student success, the GS Program provides a broad variety of services that begin with a mandatory summer intensive before the start of the first year and continue throughout the academic year with mandatory weekly tutoring and advisement sessions. Once admitted, students must participate successfully in the program for one year. Advanced Placement (AP) and transfer credits may not be used toward the completion of GS Program requirements.

For further information, visit the GS website (<http://engineering.nyu.edu/academics/support/general-studies>) or call (646) 997-3882.

Admission and Application Procedures

Admission to the General Studies Program is by invitation only. Selected first-year applicants to the NYU School of Engineering are invited to submit an application and may be interviewed by an admissions counselor to determine if their goals correspond with program objectives and services.

Academic Support Services

GS students have an array of services to help them adjust to the rigorous Tandon curriculum. Services include, but are not limited to, the following:

- A six-week on-site or online summer intensive before the start of their first year.
 - On-site students take a computer skills for engineering class and pre-college math, physics, and writing courses. Otherwise, students take an online math course. NYU Admissions decides whether the student's summer experience will be on-site or online; regardless of format, student participation in one or the other is required for admission to the NYU School of Engineering in the fall.
- College survival skills course.
- Small group tutoring and exam review sessions.
- Individual and group advisement sessions.

Advisement

At monthly group advisement meetings, students discuss questions and concerns about the academic curriculum and general college adjustment issues. Weekly individual advisement sessions are a more personal continuation of the group meetings, where students meet with a General Studies staff member to discuss a broad range of topics including academic, financial, and personal concerns as they relate to the students academic performance.

Financial Aid

General Studies students' financial-aid packages are based on the information entered on the Free Application for Federal Student Aid (FAFSA) form. Students are urged to complete the FAFSA forms as early as possible to get the best financial aid package.

Opportunity Programs (Op)

NYU offers two special college programs for residents of New York State. The Higher Education Opportunity Program (HEOP) is funded by New York State to provide broad and varied educational instruction to capable students who, due to limited academic and financial resources, might otherwise not have the opportunity to attend NYU. Once admitted to the HEOP program, students receive financial assistance, counseling, tutoring, advisement and other support services throughout their college career. HEOP's goal at NYU Tandon is to retain and graduate students who are traditionally underrepresented in engineering and science.

For more information, please visit the NYU New York State Arthur O. Eve HEOP page:
<https://www.nyu.edu/admissions/undergraduate-admissions/apply/freshmenapplicants/opportunity-programs/college-programs/new-york-state-heop.html>.

The Collegiate Science and technology Program (CSTEP) is funded by New York State to provide minority or disadvantaged student's access to academic programs that prepare students for licensure or employment in scientific, technical or health-related professions. Once admitted to the CSTEP program, students receive financial assistance, counseling, tutoring, advisement and other support services throughout their college career. CSTEP's goal at the NYU Tandon School of Engineering is to retain and graduate students who are traditionally underrepresented in engineering and science.

For more information, please visit the NYU CSTEP page: <https://www.nyu.edu/admissions/undergraduate-admissions/apply/freshmenapplicants/opportunity-programs/collegeprograms/cstep.html>.

Honors Program

The School of Engineering's Honors Program offers students of exceptional promise an enriched educational experience that extends beyond the traditional classroom environment. Learning takes place in a collaborative manner, where students are encouraged to critically reflect on their coursework by dialoging with various constituencies at the school. The program offers a superior educational experience by fostering critical thinking and creativity. Its depth and breadth are comprehensive and individualized.

Rigorous intellectual development through active learning and faculty mentoring combine with an interdisciplinary focus and global awareness prepares students to become leaders in engineering, science, technology and entrepreneurship. As rising scholars, Honors students are a highly enthusiastic and prominent part of the University's alumni population and enhance the overall reputation of the University for delivering excellence in education.

Admission and Application Procedures

The Honors Program has a referral-only admissions process. Selected individuals who are admitted to the School of Engineering as first-year students will be referred to the Honors Program by the Admissions Office. Those students referred to the Honors Program will then be asked to complete a short application and personal statement. Applications are reviewed by the Honors Program Admissions Committee. Preference is given to students with outstanding high school GPA and SAT scores; however, files are reviewed in a comprehensive manner and other important criteria are given serious consideration. Among these are the difficulty of course work (AP courses), written submissions such as the personal statement, receipt of prizes and awards, leadership positions, participation in academic clubs, and evidence of self-discipline and persistence as confirmed in the letters of recommendation. Some applicants will be asked to participate in an interview with a member of the Honors Program Admissions Committee.

Students who were not referred to the Honors Program during their initial application to SOE are not eligible for the Honors Program; there is no transferring into the program. Additionally, transfer students are not eligible for the Honors Program.

Requirements

Students admitted to the Honors Program are required to satisfy the following requirements to remain in the program:

1. Maintain a minimum required cumulative Grade Point Average (GPA) each academic year:
 - *Freshman* - 3.5
 - *Sophomore* - 3.5
 - *Junior* - 3.4
 - *Senior* - 3.4
2. Earn a specified amount of credits by the end of each academic year:
 - *Freshman* - 32
 - *Sophomore* - 64
 - *Junior* - 96
 - *Senior* - 128

At the end of each semester, the Honors Program will review each student's academic record. If the student's cumulative GPA and/or credit amount is below the minimum requirement, as outlined above, the student is placed on a one-semester probation to improve his or her academic standing. If the student's cumulative GPA and/or credit amount is still below minimum requirements after the one-semester probationary period, the student will be dismissed from the Honors Program.

To graduate with the "Graduate of the Honors Program" designation,* students must fulfill the BS requirements of the Honors Program. This condition generally requires satisfactory completion of at least three credits of BS thesis in the student's major. Students must submit a bound BS thesis to the Office of Undergraduate Academics, no later than two weeks before graduation, formatted as outlined in the document entitled: "Regulations on Format, Duplication & Publication of Reports, Theses & Dissertations," available in the Office of Undergraduate Academics.

Center For K-12 Stem Education

The New York University Tandon School of Engineering has long recognized the critical need to engage K-12 students, teachers, schools and school systems through hands-on learning in science, technology, engineering, and math (STEM). These efforts aim to increase access to high quality learning experiences, STEM-focused higher education and related careers. For more than 15 years -with funding from the National Science Foundation, and other public, philanthropic and corporate sources over that period - the School's faculty, students and the Center for K12 STEM Education have developed innovative programs that bring STEM disciplines and concepts to every level of the K-12 education system.

The Center and its programs place strong emphasis on serving those who have limited access to high-quality STEM education and those students from demographic groups that are underrepresented in STEM fields: students of color, girls and young women, and those from low-income backgrounds. Our work with teachers largely focuses on educators serving these demographic groups. On average the demographic profile of students in our programs is 81 percent are from low income backgrounds; 50 percent are female; 90 percent are students of color; and 15 percent are eligible for school-based Individualized Education Program (IEP) support for autism spectrum disorder, dyslexia, and other learning needs.

Our methodology for K-12 STEM education focuses on utilizing the expertise and passion of trained graduate and undergraduate students employed and supervised by the Center to develop and teach hands-on, activity based STEM curricula to younger students and their teachers, under the guidance of faculty members. We strongly emphasize authentic experiences: grounding curriculum and instruction in the application and integration of STEM concepts in the real-world and a social context; connecting content to ongoing research in our applied engineering, computer science and other labs; employing pedagogy that is inquiry based, problem solving and iterative; and deploying the actual tools of scientists and engineers-from microcontrollers, electronic components, actuators, and the like to high-end testing and experimental equipment used in research.

These activities take place within programmatic and structured frameworks, provided by the Center for K12 STEM Education. These initiatives are sustained, deep engagements and support learning in classrooms, after-school environments and in on- and off-campus summer programs. The Center's programs engage and mobilize the School of Engineering's many communities including faculty, administrators and students, its physical resources of laboratories and classrooms and School initiatives that expose young people and teachers to the creative, exciting and academically challenging world of science.

K-12 students and teachers that participate in the Center's programs gain analytical skills and knowledge by engaging in scientific inquiry, an excitement about the personal possibilities educational attainment provides and a deep appreciation for the inherent inventiveness embedded in all kinds of scientific and academic pursuits. Achieving these goals puts students on the path to school completion, higher education and economic and social advancement. School of Engineering students that participate acquire leadership and presentation skills, contribute to solving the pressing local and national problems of a lack of diversity and interest in STEM studies and pursuits, and enhance and reinforce their own learning, creativity and professionalism.

INDEX OF HEGIS CODES

Degrees Offered at NYU School of Engineering

NYU School of Engineering offers a wide range of degree programs leading to the degrees Bachelor of Science, Master of Science, Master of Engineering and Doctor of Philosophy. The table below indicates the degrees registered at each campus. Please check with each department to confirm that a program is currently available at the locations indicated below. Graduate courses taken at any campus are applicable toward MS and PhD degree programs officially offered at another campus.

Program Title	HEGIS Code ¹	CIP Code ²	Brooklyn	Manhattan	On-Line
Applied Physics	1902.00	14.1201	BS, MS, PhD		
Bioinformatics ³	1999.20	26.1103			MS
Biomedical Engineering	0905.00	14.0501	MS, PhD		
Biomolecular Science	0499.00	26.0210	BS		
Biotechnology	0499.00	26.1201	MS		
Biotechnology and Entrepreneurship	0499.00	26.1201	MS		
Business and Technology Management	0599.00	15.1501	BS		
Chemical and Biomolecular Engineering	0906.00	14.0701	BS		
Chemical Engineering ³	0906.00	14.0799	MS, PhD		
Chemistry	1905.00	40.0501	MS		
Civil Engineering	0908.00	14.0801	BS, MS, PhD		
Computer Engineering	0909.00	14.0901	BS,MS		MS
Computer Science	0701.00	11.0701	BS, MS, PhD		
Construction Management	0599.00	14.3301	BS, MS		
Cyber Security	0701.00	11.1003	MS		MS
Electrical Engineering ³	0909.00	14.1001	BS,MS, PhD		MS
Electrical and Computer Engineering (dual major)	0909.00	14.1001	BS		
Environmental Engineering	0922.00	14.1401	MS		
Environmental Science	0922.00	14.1401	MS		
Financial Engineering	0599.00	27.0301	MS	MS	
Industrial Engineering ³	0913.00	54.0401	MS		MS
Information Management ⁴	0599.00	14.3501	MS	MS	
Integrated Digital Media	0604.00	11.0103	BS, MS		
Management	0506.00	15.1501	MS		
Management of Technology ⁴	0599.00	15.1501	MS	MS	
Manufacturing Engineering ³	0913.00	14.3601	MS		MS

Materials Chemistry	1905.00	14.1801	PhD		
Mathematics	1701.00	27.0301	BS, MS, PhD		
Mechanical Engineering	0910.00	14.1901	BS, MS, PhD		
Mechatronics and Robotics	4904.00		MS		
Organizational Behavior, Systems & Analytics ³	0514.00	52.1339	MS		MS
Science and Technology Studies	2299.00	54.0104	BS		
Sustainable Urban Environments	4903.00	45.1201	BS		
Systems Engineering	0909.00	14.2701	MS		
Technology Management	0599.00	15.1501	PhD		
Transportation Management	0510.00	14.0804	MS		
Transportation Planning and Engineering	0908.00	14.0804	MS, PhD		
Urban Systems Engineering and Management	0999.00	14.0803	MS		

¹ Higher Education General Inventory System

² Classification of Instructional Program

³ These degrees are offered with select courses delivered at the Manhattan Center 2 Broadway, and online at www.poly.edu/epoly.

⁴ Executive format program

Advanced Certificates Offered at the NYU School of Engineering

Program Title	HEGIS code ¹	CIP Code ²	Academic Department	Campus
Bioinformatics	1999.20	26.1113		Online
Computer Engineering	0909.00	14.0901	Electrical and Computer Engineering	Brooklyn, Online
Construction Management	0599.00	14.3301	Civil Engineering/Management	Brooklyn
Cybersecurity	0799.00	11.1003	Computer Science and Engineering	Brooklyn, Online
Electronic Business Management	0599.00	15.1501	Technology Management and Innovation	Brooklyn
Entrepreneurship	0506.00	15.1501	Technology Management and Innovation	Brooklyn
Executive Construction Management (Exec 21)	0599.00	14.3301	Civil Engineering	Manhattan ¹
Financial Engineering	0599.00	27.0301	Finance and Risk Engineering	Brooklyn
Financial Technology Management	0599.00	27.0301	Finance and Risk Engineering	Brooklyn

Human Resources Management	0510.00	52.1001	Technology Management and Innovation	Brooklyn
Information Management	0702.00	15.1501	Technology Management and Innovation	Brooklyn
Organizational Behavior	0515.00	52.1003	Technology Management and Innovation	Brooklyn, Online
Project Management	0506.00		Technology Management and Innovation	Online
Risk Management	0504.00	27.0501	Finance and Risk Engineering	Brooklyn
Technology Management	0599.00	15.1501	Technology Management and Innovation	Brooklyn, Manhattan
Telecommunications Management	0599.00	15.1501	Technology Management and Innovation	Brooklyn
Traffic Engineering	0908.00	14.0804	Civil and Urban Engineering	Brooklyn
Transportations Management and Economics	0908.00	14.0804	Civil and Urban Engineering	Brooklyn
Transportation Planning	0908.00	14.0804	Civil and Urban Engineering	Brooklyn

¹ These Advanced Certificates are offered with select courses delivered at the Manhattan Center, 2 Broadway, and online at [ePoly](#).