



**NYU**

**TANDON SCHOOL  
OF ENGINEERING**

---

# **2018 – 2020 Bulletin**

# Contents

|   |     |
|---|-----|
| Mission Statement and School Profile .....                | 3   |
| Administration .....                                      | 9   |
| Administrative Offices.....                               | 11  |
| School Compliance and Guidelines .....                    | 16  |
| Statistics on Enrollment and the Student Body .....       | 18  |
| Admissions, Financial Aid, Tuitions and Fees.....         | 20  |
| Academic Calendar .....                                   | 27  |
| Undergraduate Academic Requirements and Policies .....    | 43  |
| Graduate Academic Requirements and Policies.....          | 63  |
| Academic Department, Degree and Program Information ..... | 76  |
| List of Academic Programs and Curricula .....             | 145 |
| Non-Degree Programs .....                                 | 148 |
| Bachelor of Science Programs .....                        | 178 |
| Graduate Certificate Programs .....                       | 243 |
| Master of Science Programs .....                          | 250 |
| Doctor of Philosophy Programs .....                       | 335 |
| Registration and Student Services .....                   | 367 |
| Academic Success, Advising and Tutoring Services .....    | 376 |
| Special Programs.....                                     | 379 |
| Index of HEGIS Codes.....                                 | 386 |

## **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.

---

## **Introduction**

The New York University Tandon School of Engineering (formerly the Brooklyn Polytechnic Institute, the Polytechnic University, the Polytechnic Institute of NYU, the NYU Polytechnic School of Engineering, and now widely known as 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 future labs 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 21<sup>st</sup> 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. Thanks to a visionary and generous donation made in 2015, the school was renamed the NYU Tandon School of Engineering.

The NYU Tandon School of Engineering delivers on-site and online programs locally and globally. NYU Tandon 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 eleven academic departments, and identifies the degrees that each department supervises.

- Applied Physics
- Biomedical Engineering
- 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 Tandon 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 future labs 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 future labs - 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 Tandon 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 Tandon 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 family, 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&gid=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 Student Lounge, Office of Global Services, Counseling Services, the Registrar/Financial Aid/Bursar 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 buildings 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 launched the Media and Games Network (MAGNET), on the 8th floor of 2 MetroTech Center that bring together NYU Tandon 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 Tandon 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 Tandon School of Engineering opened 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, NYU Tandon 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 NYU Tandon School of Engineering offers programs around the globe remotely through online courses. NYU Tandon 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 future labs 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.



# Administration

---

- [The Administration](#)
- 

## The Administration

### Office of the Dean

**Jelena Kovačević**

*Dean, Tandon School of Engineering*

**Sayar Lonial**

*Senior Director of Marketing and Communications, Marketing and Communications*

**Kurt Becker**

*Vice Dean of Academic Affairs*

**Steve Sagner**

*Associate Dean, Development and Alumni Relations*

### Dean's Office

Mary Cowman

*Associate Dean, Bioengineering*

Kristin Day

*Associate Dean, Academic Administration*

Anita Farrington

*Associate Dean, Student Affairs*

Peter Voltz

*Associate Dean, Graduate and Undergraduate Academics*

### Academic Departments

Lorcan M. Folan

*Head, Applied Physics*

David Pine

*Head, Chemical and Biomolecular Engineering*

Magued Iskander

*Head, Civil and Urban Engineering*

Guido Gerig

*Head, Computer Science and Engineering*

Ivan Selesnick

*Head, Electrical and Computer Engineering*

Peter Paul Carr

*Head, Finance and Risk Engineering*

Richard Thorsen

*Head, Mechanical and Aerospace Engineering*

Jonathan Soffer

*Head, Technology, Culture and Society;*

*Head, Technology Management and Innovation*

---

|

## 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

Fax: (646) 997-3449

E-mail: [engineering.alumni@nyu.edu](mailto:engineering.alumni@nyu.edu)

Hours: Monday-Friday, 9am-5pm

### Athletics

<http://gonyuathletics.com/index.aspx?path=baf>

Tel.: (646) 997-3453

Fax: (646) 997-3473

Hours: Monday-Friday, 9am-5pm

GYMNASIUM/FITNESS CENTER

Hours: Monday-Friday, 7:30am-10pm;

Sat. & Sun., 9:30am-5pm

### Bern Dibner Library of Science and Technology

<https://library.nyu.edu/locations/bern-dibner-library/>

Tel.: (646) 997-3530

Fax: (646) 997-3756

E-mail: [dibner.library@nyu.edu](mailto:dibner.library@nyu.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](mailto: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: [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

Email: [hello@futurelabs.nyc](mailto:hello@futurelabs.nyc)

20 Jay Street - Suite 312 Brooklyn, NY 11201

Tel.: (718) 407-6561

Email: [hello@futurelabs.nyc](mailto:hello@futurelabs.nyc)

15 MetroTech Center - 19th Floor Brooklyn, NY 11201

Tel.: (646) 997-3083

Email: [info@ufl.nyc](mailto:info@ufl.nyc)

87 35th St. - 2nd Floor Brooklyn, NY 11232

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 Programs

<https://engineering.nyu.edu/office-sponsored-programs>

Tel.: (646) 997-3360

Fax: (646) 997-3063

Hours: Monday-Friday, 9am-5pm

## CATT/WICAT

<https://engineering.nyu.edu/center-advanced-technology-telecommunications-catt>

Tel.: (646) 997-3050

Fax: (646) 997-3074

E-mail: [info@catt.poly.edu](mailto:info@catt.poly.edu)

Hours: Monday-Friday, 9am-5pm

## Counseling and Psychological Services

<https://www.nyu.edu/students/health-and-wellness/counseling-services.html>

Tel: (646) 997-3456

Tel.: (646) 997-3537 (for emergencies)

Email: [wellness.exchange@nyu.edu](mailto:wellness.exchange@nyu.edu)

Hours: Monday-Friday, 9am-5pm

## Center for K-12 Stem Education

<http://engineering.nyu.edu/k12stem>

Tel.: (646) 997-3524

Fax: (646) 997-3733

E-mail: [k12.stem@nyu.edu](mailto:k12.stem@nyu.edu)

Hours: Monday-Friday, 9am-5pm

## Client Services Center

<https://www.nyu.edu/fcm/workrequestform/>

Tel: (212) 998-1001

Fax: (212) 995-4671

E-mail: [contactcsc@nyu.edu](mailto:contactcsc@nyu.edu)

Hours: Monday-Friday, 6am-10pm

Sat. & Sun., 8am-8pm

## Faculty Innovations in Teaching and Learning

<https://engineering.nyu.edu/academics/support-services/faculty-innovation-fitl>

Tel.: (646) 997-3625

E-mail: [fitl@nyu.edu](mailto:fitl@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](mailto:financial.aid@nyu.edu)

Hours: Monday, Tuesday, Friday, 9am-5pm;

Wednesday, Thursday, 9am-6pm

## Freshman Programs

Tel.: (646) 997-3391

E-mail: [mparham@nyu.edu](mailto:mparham@nyu.edu)

Hours: Monday-Friday, 9am-5pm

## Polytechnic Tutoring Center

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

Tel.: (646) 997-3425

E-mail: [polytechnictutoring@nyu.edu](mailto:polytechnictutoring@nyu.edu)

Hours: Monday-Friday, 10am-6pm;

## Print Shop

<https://engineering.nyu.edu/services/copy-and-mail-center>

Tel.: (646) 997-3367

Fax: (646) 997-3136

E-mail: [polyprintshop@nyu.edu](mailto:polyprintshop@nyu.edu)

Hours: Monday-Friday, 8am-5pm

## Records + Registration

<https://engineering.nyu.edu/academics/support-services/registration>

Tel.: (646) 997-4123

Email: [tandon.registration@nyu.edu](mailto:tandon.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](mailto:housing@nyu.edu)

Hours: Monday-Friday, 9am-5pm

## Security

<https://engineering.nyu.edu/campus-and-community/student-life/student-resources-and-services/public-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](mailto:nyuengrosarc@nyu.edu)

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

## General Studies (GS) Program

<http://engineering.nyu.edu/academics/support/general-studies>  
Tel.: (646) 997-3882  
E-mail: [mbarnes@nyu.edu](mailto:mbarnes@nyu.edu)  
Hours: Monday-Friday, 9am-5pm

## Graduate Center

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

## Higher Education Opportunity Program (HEOP)

<https://engineering.nyu.edu/academics/support-services/undergraduate-services/opportunity-programs>  
Tel.: (646) 997-3370  
Fax: (646) 997-4135  
E-mail: [smbailey@nyu.edu](mailto:smbailey@nyu.edu), [tiao@nyu.edu](mailto:tiao@nyu.edu)  
Hours: Monday-Friday, 9am-5pm

## Honors Program

<http://engineering.nyu.edu/academics/honors>  
Tel.: (646) 997-3986 X73847  
Fax: (646) 997-3896  
E-mail: [jennifer.piro@nyu.edu](mailto:jennifer.piro@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: [soe-hr@nyu.edu](mailto:soe-hr@nyu.edu)  
Hours: Monday-Friday, 9am-5pm

## Information Systems

<http://engineering.nyu.edu/services/information-technology-systems>  
Tel.: (646) 997-3123  
E-mail: [soehelpdesk@nyu.edu](mailto:soehelpdesk@nyu.edu)  
Hours: Monday-Friday, 9am-5pm

## Jasper H. Kane Dining Hall

<https://nyu.campusdish.com/en/LocationsAndMenus/JasperKaneCafe>  
Tel.: (646) 997-3782  
Fax: (718) 875-0509  
E-mail: [dining.services@nyu.edu](mailto:dining.services@nyu.edu)  
Hours: Monday-Thursday, 7:30am-9pm;  
Friday, 7:30am-7pm, Sat.-Sun., 10am-7pm

## Student Affairs

<https://engineering.nyu.edu/campus-and-community/student-life/office-student-affairs>  
Tel.: (646) 997-3918  
Fax: (646) 997-3197  
E-mail: [eng.studentaffairs@nyu.edu](mailto:eng.studentaffairs@nyu.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: [js6244@nyu.edu](mailto: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](mailto:trionyupoly@gmail.com)  
Hours: Monday-Friday, 9am-5pm

## Undergraduate Academics

<http://engineering.nyu.edu/academics>  
Tel.: (646) 997-3986  
Fax: (646) 997-3896  
E-mail: [uga.engineering@nyu.edu](mailto:uga.engineering@nyu.edu)  
Hours: Monday-Friday, 9am-5pm

## Undergraduate Admissions

<https://engineering.nyu.edu/admissions/undergraduate-admissions>  
Tel.: (212) 998-4500  
E-mail: [admissions@nyu.edu](mailto: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.: (646) 997-5986  
E-mail: [career.development@nyu.edu](mailto:career.development@nyu.edu)  
Office Hours: Monday-Friday, 9am-5pm  
Drop-in Hours: Monday-Thursday, 2:30pm-4pm; Friday  
12pm-1:30pm

## Web and Media Services

## **Mailroom**

<https://engineering.nyu.edu/services/copy-and-mail-center>

Tel.: (646) 997-3604

E-mail: [mailservices@nyu.edu](mailto:mailservices@nyu.edu)

Hours: Monday-Friday, 8am-5pm

Tel.: (718) 260-3971

Fax: (718) 260-3756

E-mail: [support@webteam.poly.edu](mailto: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](#)
  - [Family Educational Rights and Privacy Act FERPA](#)
  - [Alcohol and Drugs](#)
  - [Health and Accident Insurance](#)
  - [Immunization](#)
  - [Student Identification](#)
- 

## 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 2017-2018

#### Fall 2017

| Undergraduate |    |      | Graduate |     |      | Total |
|---------------|----|------|----------|-----|------|-------|
| FT            | PT | TOT  | FT       | PT  | TOT  |       |
| 2516          | 69 | 2585 | 2241     | 474 | 2715 | 5300  |

### Student Body

#### Fall 2017

| Undergraduate |       | Graduate |       |
|---------------|-------|----------|-------|
| Men           | Women | Men      | Women |
| 1685          | 900   | 1877     | 838   |

### 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 2011, 43 percent received their Bachelor of Science degree within four years, 63 percent graduated in five years and 68 percent completed their degree within six years.

### Student Retention

First-time full-time undergraduate students continuing at the School, 2017-2018:

School-wide: 87%

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

|                   | Undergraduate Students | Graduate Students |
|-------------------|------------------------|-------------------|
| Caucasian         | 18.30%                 | 8.95%             |
| Two or More Races | 4.37%                  | 0.44%             |

|                                |        |       |
|--------------------------------|--------|-------|
| Not Applicable                 | 6.50%  | 1.80% |
| International*                 | 18.53% | 80%   |
| Hispanic                       | 12.07% | 2.14% |
| Black                          | 5.69%  | 1.40% |
| Asian/Pacific Islander         | 34.31% | 5.23% |
| American Indian/Alaskan Native | 0.12%  | 0.04% |

---

*\*International students come from more than 55 countries*

---

# Admissions, Financial Aid, Tuition and Fees

---

- [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 their essays 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.

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:



| <b>Course</b>   | <b>Years</b> |
|---|--------------|
| 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 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. Currently, no department at NYU Tandon accepts FB or A Level credits.

### **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 Tandon 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. Students can also be considered for CSTEP (Collegiate Science and Technology Entry Program).

### **Admission as an International Student**

International students must meet the following criteria for admission to NYU Tandon 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](http://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](http://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. Students who have done 3 or more years in an English curriculum are exempt. Waivers for English language testing may be found [here](#).
- 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 Tandon 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 by the time they apply 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 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 College Official'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 to submit an application to start in their third semester, 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.

## **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**

Information regarding financial aid and scholarships at New York University is provided below:

- [The Office of Financial Aid Online](#)



- [Applying for Financial Aid at NYU](#)
- [University Scholarships and Grants](#)
- [Loans](#)
- [Student Employment](#)
- [Tuition Remission](#)
- [Optional Payment Plans](#)

## 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 NYU Tandon 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 cashiering functions.

<https://www.nyu.edu/students/student-information-and-resources/bills-payments-and-refunds.html>



# Academic Calendar

The Academic Calendar provides all relevant holidays, breaks, commencement, school start/end dates as well as Registration and Bursar dates.

## Filter Options:

- Academic Calendar
- Registration Dates & Deadlines
- Bursar Deadlines
- Future Terms Only

- [Fall 2018](#)
- [January Term 2019](#)
- [Spring 2019](#)
- [Summer 2019](#)
- [Fall 2019](#)
- [January Term 2020](#)
- [Spring 2020](#)
- [Summer 2020](#)
- [Fall 2020](#)
- [January Term 2021](#)
- [Spring 2021](#)
- [Summer 2021](#)

## Fall 2018

Friday, March 16, 2018

Fall 2018 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 16, 2018

Registration Begins by appointment for Undergraduate, Graduate and Diploma students.

Monday, May 28, 2018

Memorial Day  
No classes scheduled / University Holiday

# Fall 2018

|                              |  |
|------------------------------|--|
| Wednesday, July 4, 2018      | Independence Day<br>No classes scheduled / University Holiday  |
| Tuesday, August 7, 2018      | Undergraduate Fall Payment Due<br>Failure to meet the payment deadline may result in the cancellation of class reservations  |
| Sunday, August 26, 2018      | NYU Welcome Day / Move-in Day  |
| Monday, September 3, 2018    | Labor Day<br>No classes scheduled / University Holiday   |
| Tuesday, September 4, 2018   | Fall 2018 classes begin  |
| Thursday, September 13, 2018 | Late registration begins<br><br>Initial registration between September 13, 2018 and October 1, 2018 will be charged a late registration fee<br><br>Fee for undergraduate and diploma students: \$50.00<br><br>Fee for graduate students: \$25.00   |
| Monday, September 17, 2018   | Last day to drop/add on Albert for all students  |
| Monday, September 17, 2018   | Last day of active waitlists   |
| Monday, September 17, 2018   | <b>Last day</b> of initial registration on Albert for <i>all</i> students  |
| Monday, September 17, 2018   | 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 <u>Refund Schedule for Complete Withdrawal</u> . |
| Monday, September 17, 2018   | Last day to drop fall 2018 classes and not receive a grade of "W".   |
| Tuesday, September 18, 2018  | 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 18, 2018  | 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.<br><br>Beginning today students who want to withdraw from a class should use the <u>Request Class Withdrawal</u> process.   |
| Tuesday, September 18, 2018  | Waitlists will be purged   |
| Tuesday, September 18, 2018  | 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, September 18, 2018  | Graduate Fall Payment Due<br>Failure to meet the payment deadline may result in the cancellation of class reservations   |
| Monday, September 24, 2018   | The Census Capture Date  |

# Fall 2018

Tuesday, October 2, 2018

Initial registration on or after Tuesday, October 2nd will be charged a **revised** late registration fee.

Fee for undergraduate and diploma students: \$100.00

Fee for graduate students: \$50.00

Monday, October 8, 2018

Fall Recess  
No classes scheduled

Tuesday, October 9, 2018

Legislative Day - Classes will meet according to a Monday schedule

Monday, November 5, 2018

Midterm Grades Deadline

Monday, November 5, 2018

Last day to use the Leave and Withdrawal process 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 21, 2018 -  
Friday, November 23, 2018

Student Thanksgiving Recess  
No classes scheduled

Thursday, November 22, 2018 -  
Friday, November 23, 2018

Thanksgiving Recess for University Offices  
No classes scheduled / University Holiday

Friday, December 14, 2018

Last day of Fall 2018 classes

Saturday, December 15, 2018 -  
Sunday, December 16, 2018

Reading Days

Monday, December 17, 2018 -  
Friday, December 21, 2018

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 22, 2018 -  
Sunday, January 6, 2019

**Student Winter Recess**  
No classes scheduled

Saturday, December 22, 2018 -  
Tuesday, January 1, 2019

**Winter Recess for University Offices**  
The University, including the Office of the University Registrar, will be closed from Saturday, December 22, 2018 through Tuesday, January 1, 2019.

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

Wednesday, January 2, 2019

The University reopens

# Fall 2018

Monday, January 7, 2019

January Term 2019 classes begin

# January Term 2019

Friday, September 28, 2018

January Term 2019 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 15, 2018

January 2019 registration begins at 9:00 a.m. Eastern Standard Time for most Undergraduate, Graduate and Diploma students

Wednesday, November 21, 2018 -  
Sunday, November 25, 2018

Student Thanksgiving Recess  
No classes scheduled

Thursday, November 22, 2018 -  
Sunday, November 25, 2018

Thanksgiving Recess for University Offices  
No classes scheduled / University Holiday

Tuesday, December 4, 2018

The January term tuition payment is due

Friday, December 14, 2018

Last day of Fall 2018 classes

Saturday, December 15, 2018 -  
Sunday, December 16, 2018

Reading Days

Monday, December 17, 2018 -  
Friday, December 21, 2018

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 22, 2018 -  
Sunday, January 6, 2019

Student Winter Recess  
No classes scheduled

Saturday, December 22, 2018 -  
Tuesday, January 1, 2019

Winter Recess for University Offices  
The University, including the Office of the University Registrar, will be closed from Saturday, December 22, 2018 through Tuesday, January 1, 2019.

Wednesday, January 2, 2019

The University reopens

Monday, January 7, 2019

January Term 2019 classes begin

# January Term 2019

|                            |   |
|----------------------------|---|
| Monday, January 7, 2019    | Last day to drop a class and receive a refund of 100% of tuition  |
| Monday, January 7, 2019    | The last day to drop a class without the issuance of a 'W' grade  |
| Monday, January 7, 2019    | Last day for all students to use Albert to add or drop January term classes   |
| Monday, January 7, 2019    | Last day of active waitlists  |
| Tuesday, January 8, 2019   | Beginning today students who want to withdraw from a class should use the <a href="#">Request Class Withdrawal</a> process.<br><br>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, January 8, 2019   | Beginning today students will be issued a grade of 'W' if they drop a class from their January term schedule or withdraw for the term.  |
| Tuesday, January 8, 2019   | Waitlists will be purged  |
| Wednesday, January 9, 2019 | The Census Capture Date   |
| Monday, January 21, 2019   | Martin Luther King, Jr. Birthday<br>No classes scheduled / University Holiday   |
| Friday, January 25, 2019   | Last day of January Term 2019 classes   |

# Spring 2019

|   |  |
|---|--|
| Friday, October 12, 2018                                    | Spring 2019 course search and registration status features available on Albert<br><br>Please review the <a href="#">withdrawal schedule</a> to determine when a grade of 'W' will be issued when dropping classes  |
| Monday, November 12, 2018                                   | Registration begins at 9:00 a.m. Eastern Standard Time for most Undergraduate, Graduate and Diploma students   |
| Wednesday, November 21, 2018 -<br>Sunday, November 25, 2018 | Student Thanksgiving Recess<br>No classes scheduled  |
| Thursday, November 22, 2018 -<br>Sunday, November 25, 2018  | Thanksgiving Recess for University Offices<br>No classes scheduled / University Holiday  |
| Saturday, December 22, 2018 -<br>Tuesday, January 1, 2019   | Winter Recess for University Offices<br>The University, including the Office of the University Registrar, will be closed from Saturday, December 22, 2018 through Tuesday, January 1, 2019.<br><br>During this period requests for paper transcripts and enrollment certifications will not be processed |
| Saturday, December 22, 2018 -<br>Sunday, January 6, 2019    | Student Winter Recess<br>No classes scheduled  |
| Wednesday, January 2, 2019                                  | The University reopens   |

# Spring 2019

|                             |   |
|-----------------------------|---|
| Friday, January 4, 2019     | Undergraduate Spring Payment Due<br>Failure to meet the payment deadline may result in the cancellation of class reservations   |
| Monday, January 21, 2019    | Martin Luther King, Jr. Birthday<br>No classes scheduled / University Holiday   |
| Friday, January 25, 2019    | Last day of January Term 2019 classes   |
| Monday, January 28, 2019    | Spring 2019 classes begin   |
| Tuesday, February 5, 2019   | Graduate Spring Payment Due<br>Failure to meet the payment deadline may result in the cancellation of class reservations  |
| Wednesday, February 6, 2019 | Late registration begins<br><br>Initial registration between February 6, 2019 and February 24, 2019 will be charged a late registration fee<br><br>Fee for undergraduate and diploma students: \$50.00<br><br>Fee for graduate students: \$25.00  |
| Sunday, February 10, 2019   | Last day of active waitlists  |
| Sunday, February 10, 2019   | Last day to drop/add on Albert for all students<br><br>Last day of initial registration on Albert for all students<br><br>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 <a href="#">Refund Schedule for Complete Withdrawal</a> . |
| Sunday, February 10, 2019   | Last day to drop spring 2019 classes and not receive a grade of "W"   |
| Monday, February 11, 2019   | Beginning today students will be issued a grade of 'W' if they drop a class from their spring schedule or withdraw for the term   |
| Monday, February 11, 2019   | Waitlists will be purged  |
| Monday, February 11, 2019   | 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.   |
| Monday, February 11, 2019   | Beginning today students who want to withdraw from a class should use the <a href="#">Request Class Withdrawal</a> process.<br><br>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.   |
| Sunday, February 17, 2019   | The Census Capture Date   |
| Monday, February 18, 2019   | Presidents' Day<br>No classes scheduled / University Holiday  |



# Spring 2019

Monday, February 25, 2019

Initial registration on or after Monday, February 25th, 2019 will be charged a **revised** late registration fee.

Fee for undergraduate and diploma students: \$100.00

Fee for graduate students: \$50.00

Monday, March 18, 2019 -  
Sunday, March 24, 2019

Spring Recess  
No classes scheduled

Friday, April 5, 2019

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

Friday, April 5, 2019

Faculty deadline for entering midterm grades

Monday, May 13, 2019

Last day of Spring 2019 classes

Tuesday, May 14, 2019

Reading Day

Wednesday, May 15, 2019 -  
Tuesday, May 21, 2019

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  
College of Global Public Health

Final Grades Deadline

Grades are due 72 hours after the scheduled final exam date

Wednesday, May 22, 2019

Commencement

# Summer 2019

Friday, January 11, 2019

Summer 2019 course search and registration status features available on Albert

Monday, February 11, 2019

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

Friday, May 17, 2019

The summer term tuition payment is due

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

# Summer 2019

|                         |   |
|-------------------------|---|
| Monday, May 27, 2019    | Memorial Day<br>No classes scheduled / University Holiday   |
| Monday, May 27, 2019    | Last day of active waitlists for classes scheduled during the Special Session.  |
| Monday, May 27, 2019    | Last day to drop a class scheduled in the Special Session and receive a refund of 100% Tuition and Fees   |
| Monday, May 27, 2019    | Last day to enroll on Albert for those classes scheduled during the Special Session.  |
| Tuesday, May 28, 2019   | First day of Summer term classes: 12-Week Session, 7-Week Session, First 6-Week Session, First 3-Week Session and the Special Session.                                    |
| Wednesday, May 29, 2019 | Last day to drop a class scheduled in the First 3-Week Session and receive a refund of 100% Tuition and Fees  |
| Wednesday, May 29, 2019 | Last day to drop a class scheduled in the First 3-Week Session and not be issued a grade of 'W'   |
| Wednesday, May 29, 2019 | Last day of active waitlists for classes scheduled during the First 3-Week Session  |
| Wednesday, May 29, 2019 | Last day to enroll on Albert for those classes scheduled during the First 3-Week Session  |
| Thursday, May 30, 2019  | Beginning today, withdrawal from a class scheduled in the First 3-Week Session will result in the issuance of a 'W' grade   |
| Friday, May 31, 2019    | Last day of active waitlists for classes scheduled during the 12-Week Session, the 7-Week Session, or the First 6-Week Session  |
| Friday, May 31, 2019    | Last day to enroll on Albert for classes scheduled during the 12-Week Session, the 7-Week Session, or the First 6-Week Session  |
| Friday, May 31, 2019    | Last day to drop a class scheduled during the 12-Week Session, the 7-Week Session, or the First 6-Week Session and receive a refund of 100% Tuition and Fees              |
| Friday, May 31, 2019    | 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'                           |
| Saturday, June 1, 2019  | 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 |
| Saturday, June 15, 2019 | Legislative Day for Monday classes, if requested by instructor.   |
| Sunday, June 16, 2019   | Last day of classes: First 3-Week Session.  |
| Monday, June 17, 2019   | First day of classes: Second 3-Week Session.  |
| Tuesday, June 18, 2019  | Last day to drop a class scheduled in the Second 3-Week Session and receive a refund of 100% Tuition and Fees   |
| Tuesday, June 18, 2019  | Last day to drop a class scheduled in the Second 3-Week Session and not be issued a grade of 'W'  |
| Tuesday, June 18, 2019  | Last day of active waitlists for classes scheduled during the second 3-week session   |
| Tuesday, June 18, 2019  | Last day to enroll into classes scheduled during the second 3-week session on Albert  |

# Summer 2019

|                          |   |
|--------------------------|---|
| Wednesday, June 19, 2019 | Beginning today, withdrawal from a class scheduled in the Second 3-Week Session will result in the issuance of a 'W' grade    |
| Thursday, July 4, 2019   | Independence Day<br>No classes scheduled / University Holiday   |
| Saturday, July 6, 2019   | Legislative Day for Thursday classes, if requested by instructor.   |
| Sunday, July 7, 2019     | Last day of classes: First 6-Week Session and Second 3-Week Session.  |
| Monday, July 8, 2019     | First day of classes: Second 6-Week Session and Third 3-Week Session.   |
| Tuesday, July 9, 2019    | Last day of active waitlists for classes scheduled during the Third 3-Week Session  |
| Tuesday, July 9, 2019    | Last day to enroll on Albert for those classes scheduled during the Third 3-Week Session                                      |
| Tuesday, July 9, 2019    | Last day to drop a class scheduled in the Third 3-Week Session and receive a refund of 100% Tuition and Fees                  |
| Tuesday, July 9, 2019    | Last day to drop a class scheduled in the Third 3-Week Session and not be issued a grade of 'W'                               |
| Wednesday, July 10, 2019 | Beginning today, withdrawal from a class scheduled during the Third 3-Week Session will result in the issuance of a 'W' grade |
| Thursday, July 11, 2019  | Last day of active waitlists for classes scheduled during the Second 6-Week Session   |
| Thursday, July 11, 2019  | Last day to enroll on Albert for classes scheduled during the Second 6-Week Session   |
| Thursday, July 11, 2019  | Last day to drop a class scheduled in the Second 6-Week Session and receive a refund of 100% Tuition and Fees.                |
| Thursday, July 11, 2019  | Last day to drop a class scheduled in the Second 6-Week Session and not be issued a grade of 'W'                              |
| Friday, July 12, 2019    | Beginning today, withdrawal from a class scheduled in the Second 6-Week Session will result in the issuance of a 'W' grade    |
| Sunday, July 14, 2019    | Last day of classes: 7-Week Session.  |
| Sunday, July 28, 2019    | Last day of classes: Third 3-Week Session.  |
| Monday, July 29, 2019    | First day of classes: Fourth 3-Week Session.  |
| Tuesday, July 30, 2019   | Last day of active waitlists for classes scheduled during the Fourth 3-Week Session   |
| Tuesday, July 30, 2019   | Last day to enroll on Albert for those classes scheduled during the Fourth 3-Week Session                                     |
| Tuesday, July 30, 2019   | Last day to drop a class scheduled in the Fourth 3-Week Session and receive a refund of 100% Tuition and Fees                 |
| Tuesday, July 30, 2019   | Last day to drop a class scheduled in the Fourth 3-Week Session and not be issued a grade of 'W'                              |
| Wednesday, July 31, 2019 | Beginning today, withdrawal from a class scheduled in the Fourth 3-Week Session will result in the issuance of a 'W' grade    |
| Thursday, August 1, 2019 | The Census Capture Date   |

# Summer 2019

Sunday, August 18, 2019

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.

# Fall 2019

Friday, March 15, 2019

Fall 2019 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 15, 2019

Registration Begins by appointment for Undergraduate, Graduate and Diploma students.

Sunday, August 25, 2019

NYU Welcome Day / Move-in Day

Monday, September 2, 2019

Labor Day  
No classes scheduled / University Holiday

Tuesday, September 3, 2019

Fall 2019 classes begin

Monday, October 14, 2019

Fall Recess  
No classes scheduled

Tuesday, October 15, 2019

Legislative Day - Classes will meet according to a Monday schedule

Wednesday, November 27, 2019 -  
Friday, November 29, 2019

Student Thanksgiving Recess  
No classes scheduled

Thursday, November 28, 2019 -  
Friday, November 29, 2019

Thanksgiving Recess for University Offices  
No classes scheduled / University Holiday

Friday, December 13, 2019

Last day of Fall 2019 classes

Saturday, December 14, 2019 -  
Sunday, December 15, 2019

Reading Days

# Fall 2019

Monday, December 16, 2019 -  
Friday, December 20, 2019

## 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 21, 2019 -  
Wednesday, January 1, 2020

## Winter Recess for University Offices

The University, including the Office of the University  
Registrar, will be closed from Saturday, December 21, 2019  
through Wednesday, January 1, 2020.

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

Saturday, December 21, 2019 -  
Sunday, January 5, 2020

## Student Winter Recess

No classes scheduled

Thursday, January 2, 2020

The University reopens

# January Term 2020

Friday, September 27, 2019

January 2020 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 7, 2019

Registration Begins by appointment for Undergraduate, Graduate  
and Diploma students.

Thursday, January 2, 2020

The University reopens

Monday, January 6, 2020

January Term 2020 classes begin

Monday, January 20, 2020

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

Friday, January 24, 2020

Last day of January Term 2020 classes

# Spring 2020

Friday, October 11, 2019

Spring 2020 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 11, 2019

Registration Begins by appointment for Undergraduate, Graduate and Diploma students.

Monday, January 27, 2020

Spring 2020 classes begin

Monday, February 17, 2020

Presidents' Day  
No classes scheduled / University Holiday

Monday, March 16, 2020 -  
Sunday, March 22, 2020

Spring Recess  
No classes scheduled

Monday, May 11, 2020

Last day of Spring 2020 classes

Tuesday, May 12, 2020

Reading Day

Wednesday, May 13, 2020 -  
Tuesday, May 19, 2020

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  
College of Global Public Health

Final Grades Deadline

Grades are due 72 hours after the scheduled final exam date

Wednesday, May 20, 2020

Commencement (tentative date)

# Summer 2020

Friday, January 10, 2020

Summer 2020 course search and registration status features available on Albert.

Monday, February 10, 2020

Registration Begins by appointment for Undergraduate, Graduate and Diploma students.

Monday, May 25, 2020

Memorial Day

No classes scheduled / University Holiday

Tuesday, May 26, 2020

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



# Summer 2020

|                         |   |
|-------------------------|---|
| Saturday, June 6, 2020  | Legislative Day for Monday classes, if requested by instructor.   |
| Sunday, June 14, 2020   | Last day of classes: First 3-Week Session.  |
| Monday, June 15, 2020   | First day of classes: Second 3-Week Session.  |
| Saturday, June 27, 2020 | Legislative Day for Friday classes, if requested by instructor.   |
| Friday, July 3, 2020    | Independence Day (observed)   |
|                         | No classes scheduled / University Holiday   |
| Saturday, July 4, 2020  | Independence Day  |
|                         | No classes scheduled / University Holiday   |
| Sunday, July 5, 2020    | Last day of classes: First 6-Week Session and Second 3-Week Session.  |
| Monday, July 6, 2020    | First day of classes: Second 6-Week Session and Third 3-Week Session.                                       |
| Sunday, July 12, 2020   | Last day of classes: 7-Week Session.  |
| Sunday, July 26, 2020   | Last day of classes: Third 3-Week Session.  |
| Monday, July 27, 2020   | First day of classes: Fourth 3-Week Session.  |
| Sunday, August 16, 2020 | 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.                                   |

# Fall 2020

|  |  |
|--|--|
| Friday, March 20, 2020                                     | Fall 2020 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 20, 2020                                     | Registration Begins by appointment for Undergraduate, Graduate and Diploma students.   |
| Sunday, August 23, 2020                                    | NYU Welcome Day / Move-in Day  |
| Wednesday, September 2, 2020                               | Fall 2020 classes begin  |
| Monday, September 7, 2020                                  | Labor Day<br>No classes scheduled / University Holiday   |
| Wednesday, September 9, 2020                               | Legislative Day - Classes will meet according to a Monday schedule.  |
| Thursday, November 26, 2020 -<br>Friday, November 27, 2020 | Student Thanksgiving Recess<br>No classes scheduled  |
| Thursday, November 26, 2020 -<br>Friday, November 27, 2020 | Thanksgiving Recess for University Offices<br>No classes scheduled / University Holiday  |



# Fall 2020

Sunday, December 13, 2020

Last day of Fall 2020 classes

Monday, December 14, 2020

Reading Day

Tuesday, December 15, 2020 -  
Monday, December 21, 2020

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

Tuesday, December 22, 2020 -  
Sunday, January 3, 2021

**Student Winter Recess**

No classes scheduled

Wednesday, December 23, 2020 -  
Sunday, January 3, 2021

**Winter Recess for University Offices**

The University, including the Office of the University Registrar, will be closed from Wednesday, December 23, 2020 through Sunday, January 3, 2021.

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

Monday, January 4, 2021

The University reopens

# January Term 2021

Thursday, September 24, 2020

January 2021 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 19, 2020

Registration Begins by appointment for Undergraduate, Graduate and Diploma students.

Monday, October 19, 2020

Registration Begins by appointment for Undergraduate, Graduate and Diploma students.

Monday, January 4, 2021

The University reopens

Monday, January 4, 2021

January Term 2021 classes begin

Monday, January 18, 2021

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

# January Term 2021

Friday, January 22, 2021

Last day of January Term 2021 classes

## Spring 2021

Friday, October 16, 2020

Spring 2021 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 16, 2020

Registration Begins by appointment for Undergraduate, Graduate and Diploma students.

Monday, January 25, 2021

Spring 2021 classes begin

Monday, February 15, 2021

Presidents' Day  
No classes scheduled / University Holiday

Monday, March 15, 2021 -  
Sunday, March 21, 2021

Spring Recess  
No classes scheduled

Monday, May 10, 2021

Last day of Spring 2021 classes

Tuesday, May 11, 2021

Reading Day

Wednesday, May 12, 2021 -  
Tuesday, May 18, 2021

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  
College of Global Public Health

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

Wednesday, May 19, 2021

Commencement (tentative date)

## Summer 2021

# Summer 2021

|                          |  |
|--------------------------|--|
| Friday, January 8, 2021  | Summer 2021 course search and registration status features available on Albert.  |
| Monday, February 8, 2021 | Registration Begins by appointment for Undergraduate, Graduate and Diploma students.   |
| Monday, May 24, 2021     | First day of Summer term classes: 12-Week Session, 7-Week Session, First 6-Week Session, First 3-Week Session and the Special Session.   |
| Monday, May 31, 2021     | Memorial Day<br><br>No classes scheduled / University Holiday  |
| Sunday, June 13, 2021    | Last day of classes: First 3-Week Session.   |
| Monday, June 14, 2021    | First day of classes: Second 3-Week Session.   |
| Saturday, June 19, 2021  | Legislative Day for Monday classes, if requested by the instructor.  |
| Saturday, July 3, 2021   | Last day of classes: First 6-Week Session and Second 3-Week Session.   |
| Sunday, July 4, 2021     | Independence Day<br><br>No classes scheduled / University Holiday  |
| Monday, July 5, 2021     | Independence Day (observed)<br><br>No classes scheduled / University Holiday   |
| Tuesday, July 6, 2021    | First day of classes: Second 6-Week Session and Third 3-Week Session.  |
| Sunday, July 11, 2021    | Last day of classes: 7-Week Session.   |
| Sunday, July 25, 2021    | Last day of classes: Third 3-Week Session.   |
| Monday, July 26, 2021    | First day of classes: Fourth 3-Week Session.   |
| Saturday, July 31, 2021  | Legislative Day for Monday classes, if requested by the instructor.  |
| Sunday, August 15, 2021  | Last day of classes: 12-Week Session, Second 6-Week Session, Fourth 3-Week Session and the Special Session.<br><br>Final Grades Deadline. Grades are due 72 hours after the scheduled final. |

# Undergraduate Academic Requirements and Policies

---

- [Program Areas](#)
  - [Undergraduate Degree Requirements](#)
  - [Modifications to Curricula](#)
  - [Undergraduate Credits](#)
  - [Graduation](#)
  - [Undergraduate International Students](#)
  - [Class Standing for Undergraduates](#)
  - [Policies on Undergraduate Grading and Grades](#)
  - [Undergraduate Academic Standing and Probation](#)
  - [Leave of Absence and Withdrawal from the School](#)
  - [Internship Policies and Guidelines](#)
- 

## 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
- Technology, Culture, and Society
- 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 21<sup>st</sup> 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.

## **Technology, Culture, and Society**

Within the NYU Tandon School of Engineering, humanists, artists, and social scientists study the significance and impact of technology over time, and the relationship between technology and civic virtue. We fulfill that mission through majors in Integrated Digital Media (IDM), Science and Technology Studies (STS), and Sustainable Urban Environments (SUE), and liberal arts courses specifically designed to help engineering students understand the complex moral and social consequences of their work.

## **Technology Management and Innovation**

NYU Tandon School of Engineering's Department of Technology Management and Innovation 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 and Innovation 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 and Innovation offers short-term nondegree 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 time lines 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 course placement 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 and International Baccalaureate 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-UY 914](#), [MA-UY 954](#), [MA-UY 1024](#), [MA-UY 1054](#), or [MA-UY 1324](#).

## **Writing Placement**



Incoming students will be automatically placed into [EXPOS-UA 1 Writing the Essay](#). A first day in-class writing sample will be used to determine if any students should be changed to [EXPOS-UA 4 International Workshop Writing I](#).

International students who are flagged for the English-language survey will be required to take an online diagnostic exam.

## 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 Academic 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 eight General Criteria that every engineering program should address: (1) Students; (2) Program Educational Objectives; (3) Student Outcomes; (4) Continuous Improvement; (5) Curriculum; (6) Faculty; (7) Facilities; and (8) Institutional Support.

## **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 Tandon 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 Undergraduate Academics. 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 Undergraduate Academics.

## **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 Tandon 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 Office of Undergraduate Academics 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 [BSMS 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.

## **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 Tandon 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 Tandon.

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 NYU Tandon for which transfer credit already has been given automatically forfeit the transfer credit for that course.

For new first-year students admitted to NYU, it may be possible to transfer college courses taken while in high school. Credit may be awarded if the following criteria are met: 1) Received a grade of B or better; 2) NYU offers corresponding courses; 3) Courses were not used to satisfy high school graduation requirements.

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 the [Office of Undergraduate Admissions](#).

### **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 NYU Tandon 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 the Degree Adjustment form with the Office of Undergraduate Academics. 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.

Also excluded from credit toward the degree are any courses taken in the School of Professional Studies once a student is registered in Tandon.

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 and International Baccalaureate Credits**

NYU Tandon School of Engineering grants students credit for approved Advanced Placement (AP) and International Baccalaureate (IB) courses in high school, given acceptable performance on AP and IB examinations. Students must request evaluation of AP and IB 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, international baccalaureate, 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 Undergraduate Academics.

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 Undergraduate Academics as outlined in the document entitled "Regulations on Format, Duplication and Publication of Reports, Theses and Dissertations," available in the Office of Undergraduate Academics. 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 NYU Tandon 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 Albert Student Center. Those students without access to Albert 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 - 31.5 credits      |
| Sophomore | 32 - 63.5 credits     |
| Junior    | 64 - 95.5 credits     |
| Senior    | 96 or more<br>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 School, 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:

|     | <b>Point Value</b> | <b>Description</b>                                 |
|-----|--------------------|--|
| A   | 4.000              | Excellent  |
| A-  | 3.667              | Excellent  |
| B+  | 3.333              | Good   |
| B   | 3.000              | Good   |
| B-  | 2.667              | Good   |
| C+  | 2.333              | Satisfactory                                       |
| C   | 2.000              | Satisfactory                                       |
| C-  | 1.667              | Satisfactory                                       |
| D+  | 1.333              | Minimum<br>Passing Grade                           |
| D   | 1.000              | Minimum<br>Passing Grade                           |
| F   | 0.000              | Failure  |
| S   |                    | Satisfactory                                       |
| U   |                    | Unsatisfactory<br>Progress                         |
| W   |                    | Withdrew<br>Officially                             |
| I   |                    | Incomplete<br>(converts to F<br>after 180<br>days) |
| AUD |                    | Auditor Status                                     |
| P   |                    | Passing  |
| NR  |                    | No record  |

In computing GPAs, NYU Tandon 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 the Albert Student Center. 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 Chair. Upon approval of the Department Chair, 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 Office 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 EXPOS-UA 13, 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 Office 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 Office 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 Office of Academic Affairs, faculty and a representative of the student's major department, shall jointly disqualify from the School 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 (646.997.3918) 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 (646.997.3918) 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 online via the Albert Student Center.

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 Undergraduate Academics.

## **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](mailto: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](mailto: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 [Refund Schedule](#) posted online. 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 via the Albert Student Center, 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 Tandon 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 Academics will determine whether the student is eligible to continue his/her studies at NYU Tandon School of Engineering.

---

## Graduate Academic Requirements and Policies

---

- [Graduate Degrees and Advanced Certificates](#)
  - [Graduate Credits and Requirements](#)
  - [Graduate International Students](#)
  - [Policies on Grading and Grades](#)
  - [Academic Standing and Probation](#)
  - [Leaves of Absence and Readmission](#)
  - [Withdrawal from the University](#)
  - [Application Process for the Award of Graduate Degrees and Certificates](#)
  - [Continuation of Studies Beyond the Initial Certificate or Master of Science](#)
  - [Internship Policies and Guidelines](#)
- 

This section details the general School-wide degree requirements that apply to all NYU Tandon 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 Tandon 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 Tandon 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 Tandon 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 Tandon 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 Tandon 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 Tandon 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 Tandon 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 Tandon 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 Tandon School of Engineering. Credits submitted for consideration must be: 1) from accredited institutions; 2) consistent with NYU Tandon 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 Tandon School of Engineering's undergraduate students (See section: Transfer Policy Exceptions: NYU Tandon 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 Tandon 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 students who take graduate courses while pursuing an undergraduate degree at any school of NYU. Such graduate courses may be applied subsequently to a graduate degree at NYU Tandon provided that students earned a B grade or better, that the individual courses were not used to fulfill requirements for the undergraduate degree, and that the courses are acceptable based on the particular graduate degree curriculum requirement.

The sum of transfer credits from other institutions and internal transfer credits from other NYU schools (including graduate courses taken while matriculated as NYU undergraduates) cannot exceed the total number of transfer credits permitted for Advanced Certificates, MS and PhD degrees as specified above in the section on "Transfer Credits."

These exceptions to the Transfer Policy are effective for any student admitted for the Spring 2017 semester forward.

### **NYU Tandon School of Engineering BS/MS Students**

NYU Tandon 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 Tandon 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 Tandon 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 Tandon 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 Tandon 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 Tandon 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**

### **Certificate Students**

Graduate certificate programs must be completed within 3 years from the time of admission to graduate studies at NYU Tandon.

### **MS and ME Students**

MS and ME degree programs must be completed within 5 years from the beginning of graduate studies at NYU Tandon.

### **PhD Students Admitted Prior to Spring 2019**

PhD programs must be completed within 6 years for full-time students and 12 years for part-time students, counting from the time of admission to graduate studies at NYU Tandon (not from the beginning of PhD studies).

### **PhD Students Admitted as of Spring 2019**

Full-time PhD students transferring in 24 or more credits are granted 6 years to complete their PhD studies, counting from the time of admission into the PhD program at NYU Tandon. Full-time students transferring fewer than 24 credits have 7 years to complete the PhD program, counting from the time of admission into the PhD program. Part-time PhD students must complete all requirements for the PhD within 9 years, counting from the time of admission into the PhD program.

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 Tandon 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 Tandon 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     | 4.000       | Excellent                                |
| A-    | 3.667       | Excellent                                |
| B+    | 3.333       | Good                                     |
| B     | 3.000       | Good                                     |
| B-    | 2.667       | Good                                     |
| C+    | 2.333       | Deficient, but Passing                   |
| C     | 2.000       | Deficient, but Passing                   |
| F     | 0.000       | 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 Albert Student Center 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 Tandon SOE Records and Registration 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 Tandon SOE Office of Records and Registration 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 NYU Tandon 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. For students admitted prior to Spring 2019, the Leave of Absence does not extend the time limit for earning a degree. For students admitted as of Spring 2019, any approved Leave of Absence does not count against the maximum time to completion, and the time limit will be extended by the number of semesters granted for Leave of Absence. (See section on Maximum Time for Program 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 Tandon 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 Tandon 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 Tandon 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 Tandon SOE Office of Records and Registration and approved by all required signatories. Students who submit an online total withdrawal request which is approved must reapply to NYU Tandon SOE should they wish to resume their studies in the future, and readmission is not guaranteed.

### **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. 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 Tandon 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 NYU Tandon 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 Tandon 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.

## **Internship Policies and Guidelines**

Internship courses are designated by CP-GY and CP-UY.

These courses provide an opportunity for full-time students to pursue internship and work experiences in their fields of study that enhance and augment classroom learning, while also enhancing the overall educational experience at the undergraduate and graduate level by obtaining practical experience.

### **Eligibility and Requirements: Students**

During the academic year, students must maintain full-time status (graduate students must be enrolled in at least 9 credits; undergraduate students must be enrolled in at least 12 credits) in order to be able to take CP courses. During the summer, the requirement of full-time study is dropped, but students must have been enrolled full-time in the previous spring semester. Students in their final semester who are taking less than a full-time course load are eligible to participate, but must have been full-time students in the previous semester.

Students must have completed at least two semesters of full-time study. This may include transfer credits from another institution.

Graduate students must have a grade point average (GPA) of at least 3.00, as reflected on their academic transcript. Undergraduate students must have a GPA of at least 2.50, as reflected on their academic transcript. Students cannot enroll in CP courses if they have an incomplete grade in any course from a prior semester. Students cannot enroll in a subsequent CP course if they have an Incomplete or a Fail grade from a previous CP course.

### **Eligibility and Requirements: Work Experiences**

During the academic year, work experiences must be at least 12 weeks long. During the summer, they must be at least 8 weeks long. Additionally, the work experience must be a minimum of 240 hours. Start and end dates need not coincide with the first

and last day of the semester, but must fit within the semester in order to ensure that final reports may be submitted and grades may be submitted in a timely manner.

During the academic year, students cannot work more than 20 hours per week while classes are in session. Students who are in their final semester of study and who require, and are registered for, no more than 3 credits (in addition to internship credits) may be approved to work 40 hours per week. During the summer, students are permitted to work full-time, provided that they are not also taking more than 3 credits. Work hours must be consistent with the organization's regular work schedule.

Work experiences must comply with the Fair Labor Standards Act ([www.dol.gov/whd/flsa](http://www.dol.gov/whd/flsa)). As such, students must be paid at least minimum wage unless specific exceptions apply. The Department of Labor outlines a six-point test ([www.dol.gov/whd/regs/compliance/whdfs71.htm](http://www.dol.gov/whd/regs/compliance/whdfs71.htm)) regarding unpaid internships. Employers should consult their legal counsel for more information.

Students must be hired as employees of the participating organization and must be paid directly by the organization using a W-2 form. Employers cannot pay students as independent contractors using an IRS 1099 form.

Employers must agree to assign a responsible, ranking employee as the student's supervisor. This individual will provide appropriate supervision and mentoring, including establishing clear goals and expectations regarding tasks and projects. Employers must be willing to submit written midterm and final evaluations of the student's work. Experiences will not be approved for companies that are not permitted to submit written evaluations. Employer supervisors must review the student's final report so that proprietary and/or confidential information can be removed.

## **Procedures**

Students must obtain an offer letter on organization letterhead from the prospective employer. This letter must identify the company, its address, contact information, the student's job title, and start and end dates of the internship.

Students must update their placement information through their NYU CareerNet account Profile, per instructions provided by the Wasserman Center for Career Development.

Prospective employers must complete the Employer Registration Form, which includes a detailed job description.

Students will submit their offer letter, Employer Registration Form, and printed NYU CareerNet Profile to their departmental adviser who will identify a suitable faculty adviser. The faculty adviser will be responsible for all academic matters related to the work experience. The faculty adviser will evaluate the relevancy of the work experience and, if approved, will direct the student to register for the appropriate CP course.

For approved International Students, the faculty adviser will provide the Office of Global Scholars (OGS) with all relevant information in order to process work authorization. International Students cannot begin working until they have received work authorization.

The company supervisor must provide a mid-term evaluation and a final evaluation to the faculty supervisor. The student will submit a project report at the end of the term. Some departments or programs may also require a presentation. The report (and presentation, if required) will be included as a part of the assessment for the student's grade. Faculty advisers will provide guidelines for the reports. All CP courses will be graded as Pass (P) or Fail (F).

With the faculty adviser's approval, consecutive work experiences may be completed with the same employer. Students must complete the same registration process and follow all procedures for re-applying and enrolling in another CP course. International Students must obtain prior permission from OGS for every period of employment. Students are not authorized to work during the interim period between the end of their prior CPT and the beginning of their next even if they will have an internship with the same company; this jeopardizes their visa status.

# 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 Biomedical Engineering

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

### Master of Science

- [Biomedical Engineering, Bioinstrumentation Track, M.S.](#)
- [Biomedical Engineering, Biomaterials Track, M.S.](#)
- [Biomedical Engineering, Medical Imaging Track, M.S.](#)

### Doctor of Philosophy

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

## 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, B.S.](#)

- [Chemical and Biomolecular Engineering, B.S.](#)

#### **Master of Science**

- [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**

- [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](#)
- [Transportation Minor](#)
- [Urban Informatics 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, 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.](#)

## **Department of Mechanical and Aerospace Engineering**

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

#### **Non-Degree**

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

#### **Bachelor of Science**

- [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, Fluid Dynamics and Thermal Systems, 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 of Technology, M.S.](#)

#### **Doctor of Philosophy**

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

## **Enterprise Learning**

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

## **NYU Tandon Online**

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

#### **Graduate Certificate**

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

#### **Master of Science**

- [Bioinformatics \(Online\), M.S.](#)
- [Computer Engineering \(Online\), M.S.](#)
- [Cybersecurity \(Online\), 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

NYU Tandon School of Engineering

Six MetroTech Center

Brooklyn, NY 11201

Tel: (646) 997-3072

Fax: (646) 997-3139

E-mail: [appliedphysics@nyu.edu](mailto: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*

## 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 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

**Akhil Lal**, Adjunct Professor

PhD, Polytechnic University

**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

**Edward L. Wolf**, Professor Emeritus  
PhD, Cornell University

---

# Department of Biomedical Engineering

---

Chair: Mary K. Cowman

## Mission Statement

The overall mission of the Biomedical Engineering Department is to prepare our students for careers that leverage a deep foundation in engineering and technology in order to discover, design, and develop new engineering products, systems and processes to improve human health and wellness.

## The Department

The newly established Department of Biomedical Engineering has assembled a core of renowned faculty from multiple disciplines in the NYU Tandon School of Engineering and the NYU School of Medicine. Biomedical Engineering is inherently multidisciplinary, and the new department reflects that breadth in its faculty, educational programs, and research.

The department currently offers the MS and PhD degrees in Biomedical Engineering. The PhD program is not currently accepting students. Our graduate programs include courses in areas such as human anatomy and physiology, applied math, medical imaging, digital signal processing, tissue engineering, and biomedical instrumentation, with a choice of specialized tracks in Biomaterials, Medical Imaging and Bioinstrumentation. Students are encouraged to engage in engineering research projects in collaboration with medical researchers and clinicians, on problems of immediate importance and application.

Our faculty and students focus on connecting engineering and technology with medicine. They create new approaches and tools for medical imaging, tissue engineering and repair, bioinstrumentation and biosensors, mechanobiology, robotics and prosthetics, computational medicine, systems genetics, and a wide variety of other applications. For example, our biomedical engineers have multiple joint projects involving researchers from the Orthopaedic Surgery Department, for novel cartilage and bone repair biotherapeutics and joint implants. We are working with our counterparts in radiology and radiation oncology on new signal processing and data management protocols for medical imaging and radiotherapy. We work with neurologists on devices and analysis approaches for on-site detection of mild traumatic brain injuries. Our faculty are collaborating with physicians working in cardiovascular medicine on the development of new stent delivery devices, and with faculty in rehabilitation medicine on recovery and enhancement of physical abilities. These and other project areas are supported by our strengths in medical imaging, signal processing and analysis, wireless devices, big data management and visualization, novel detection phenomena and diagnostic devices, controlled biomolecular structure and interactions, and computational modeling of complex systems. Our department faculty, staff, and students are knowledge brokers, inventors, innovators, entrepreneurs, and partners with companies engaged in healthcare technologies and therapeutics.

Our faculty and research laboratories are located in both our downtown Brooklyn campus, and at our First Avenue labs in Manhattan adjacent to the NYU Medical, Dental, and Nursing schools. Our biomedical engineering faculty have close connections with the physicians, faculty, researchers, and patients at NYU Langone Health and other nearby institutions of the Health Corridor, while maintaining teaching and research appointments in the Tandon School of Engineering. The Biomedical Engineering Department serves as a central point of coordination between health professionals and engineers, linking new enabling technologies with the real world needs of our communities in NYC and across our NYU Global Network locations.

## Contact

NYU Tandon School of Engineering

Biomedical Engineering Department



433 First Avenue, room 904

New York, NY 10010

Tel: (212) 992-5970

**Web:** <https://engineering.nyu.edu/academics/departments/biomedical-engineering>

**Email:** [engineering-bme@nyu.edu](mailto:engineering-bme@nyu.edu)

## Degrees Offered

### Master of Science

- [Biomedical Engineering, Biomaterials Track, M.S.](#)
- [Biomedical Engineering, Medical Imaging Track, M.S.](#)
- [Biomedical Engineering, Bioinstrumentation Track, M.S.](#)

### Doctor of Philosophy

- Biomedical Engineering (not currently accepting students)

## FACULTY

### Professors

#### Jef Boeke, PhD, DSc

Professor of Biochemistry & Molecular Pharmacology, and Biomedical Engineering

Director of the Institute of Systems Genetics

Member NAS, AAA&S

#### Mary K. Cowman, PhD

Professor of Biomedical Engineering, and Orthopaedic Surgery

Associate Dean for Bioengineering

#### Thorsten Kirsch, PhD

Professor of Orthopaedic Surgery, Cell Biology, and Biomedical Engineering

Vice Chair for Research, Orthopaedic Surgery

Director, Musculoskeletal Research Center

#### Joel S. Schuman, MD, FACS

Professor of Ophthalmology, Neuroscience & Physiology, Neural Science, Biomedical Engineering, and Electrical & Computer Engineering

Chair, Ophthalmology

Director, NYU Langone Eye Center

#### Ivan Selesnick, PhD

Professor of Electrical & Computer Engineering, Biomedical Engineering, and Radiology

Chair, Electrical & Computer Engineering

**Daniel Sodickson, MD, PhD**

Professor of Radiology, Neuroscience & Physiology, and Biomedical Engineering

Vice Chair for Research, Radiology

Director of the Bernard and Irene Schwartz Center for Biomedical Imaging

Principal Investigator of the Center for Advanced Imaging Innovation and Research

Co-director, Tech4Health

**Samir Taneja, MD**

Professor of Urology, Radiology, and Biomedical Engineering

Vice Chair, Urology

Director, Division of Urologic Oncology

GU Program Director, Perlmutter Cancer Center

**Yao Wang, PhD**

Professor of Electrical & Computer Engineering, Biomedical Engineering, and Radiology

**Assistant Professors**

**Alesha B. Castillo, PhD**

Assistant Professor of Biomedical Engineering, and Orthopaedic Surgery

**Weiqliang Chen, PhD**

Assistant Professor of Biomedical Engineering, and Mechanical & Aerospace Engineering

**John-Ross Rizzo, MD**

Assistant Professor of Rehabilitation Medicine, Neurology, Mechanical & Aerospace Engineering, and Biomedical Engineering

Director, Visuomotor Integration Laboratory

Director, Rehabilitation Engineering Alliance and Center Transforming Low Vision

**Industry Faculty**

**Gene R. DiResta, PhD, PE, DABR**

Industry Professor of Biomedical Engineering

# Department of Chemical and Biomolecular Engineering

---

Chair: David Pine

## Programs offered:

- 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

PhD, City University of New York

*Optics, biophotonics, microparticle photophysics, physical virology, organic solid-state physics*

**Eray Aydil**, Alstadt-Lord-Mark Professor

PhD, University of Houston

*Electrochemical materials and devices; Electronic, magnetic and photonic materials; Energy, materials processing;*

*Nanomaterials and nanotechnology*

**Bruce A. Garetz**, Professor

PhD, Massachusetts Institute of Technology

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

**Rastislav Levicky**, Professor

PhD, University of Minnesota

*Biological polyelectrolytes, biosensors and bio-diagnostics*

**John T. McDevitt**, Professor, Chair of Department of Biomaterials and Biomimetics, NYUCD

PhD, Stanford University

*Microdevices, biomaterials*

**Jovan Mijovic**, Professor

PhD, University of Wisconsin at Madison

*Relaxation dynamics in synthetic and biological complex systems, modeling of processing of polymers*

**Jin Kim Montclare**, Professor

PhD, Yale University

*Molecular design, protein engineering, biomaterials and biocatalysis*

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

**Elisa Riedo**, Professor  
PhD, University of Milan  
*Nano-confined liquids; nanotribology; nanomechanics; thermochemical nanolithography*

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

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

## **Associate Professors**

**Jin Ryoung Kim**, Associate Professor  
PhD, University of Wisconsin at Madison  
*Protein engineering, structure and properties of proteins*

**André Taylor**, Associate Professor  
PhD, University of Michigan  
*Novel materials and devices for energy conversion and storage*

## **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*

**Miguel Modestino**, Assistant Professor  
PhD, University of California, Berkeley  
*Electrochemical devices; composite materials development, processing and characterization*

**Ayaskanta Sahu**, Assistant Professor  
PhD, University of Minnesota, Twin Cities  
*Investigating transport phenomena in new classes of nanostructured hybrid materials that have promise for optoelectronic and thermoelectric energy conversion*

## **Industry Professors**

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

## **Industry Associate Professors**

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

## **Industry Assistant Professors**

**Yanir Maidenberg**, Industry Assistant Professor  
PhD, Columbia University

**Julia Robinson-Surry**, Industry Assistant Professor  
PhD, Massachusetts Institute of Technology

## Lecturers

**Tommy S. Lee**, Senior Lecturer  
MPhil, New York University

**Charles P. Martucci**, Senior Lecturer  
PhD, Columbia University

**Myron I. Pollack**, Senior Lecturer  
PhD, New York University

**Alexandra Seidenstein**, Lecturer  
MS, Long Island University

**Xin Wang**, Lecturer  
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*

## Faculty Emeriti

**Mark M. Green**, Professor Emeritus  
PhD, Princeton University

**Ernest Loebel**, Professor Emeritus  
PhD, Columbia University

**Nancy M. Tooney**, Associate Professor Emerita  
PhD, Brandeis University

---

# Department of Civil and Urban Engineering

---

*Chair:* Magued 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 21<sup>st</sup> 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

NYU Tandon School of Engineering

Six MetroTech Center

Brooklyn, NY 11201

Tel: (646) 997-3223

Web: <https://engineering.nyu.edu/academics/departments/civil-and-urban-engineering>

## 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

### *Undergraduate Minors*

- Construction Management Minor
- Transportation Minor
- Urban Informatics Minor

### *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*

## 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) Griffith**, 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*

**Michael Horodniceanu**, Professor & Chair the Institute of Construction Innovations  
PhD, NYU Tandon School of Engineering  
*Engaging stakeholders across the construction industry, including developers, designers, contractors, and government officials, in formulating new approaches to the construction challenges*

**Magued G. Iskander**, F.ASCE, PE, Department Chair 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*

**Samer Madanat**, Global Network Professor of Engineering; Dean of Engineering, NYUAD  
PhD, Massachusetts Institute of Technology  
*Transportation infrastructure management*

**Kaan Ozbay**, Professor, Department of Civil and Urban Engineering  
PhD, Virginia Polytechnic Institute and State University  
*Transportation modeling for safety and emergency management operations, real-time traffic control, ITS technology, transportation network organization*

**Maurizio Porfiri**, Professor  
PhD, Virginia Polytechnic Institute & State University  
*Dynamical Systems Theory and Applications, Mechanics of Advanced Materials, Multiphysics Modeling*

## **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*

**Mohsen Hossein**, Industry Professor of Civil Engineering, Coordinator of Graduate Programs in Civil Engineering  
PhD, McGill University  
*Geotechnical engineering, environmental geotechnology, environmental impact assessment*

**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*

**José M. Ulerio**, Industry 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*

## **Associate Professors**

**Masoud Ghandehari**, Associate Professor of Civil Engineering

PhD, Northwestern University

*Mechanics of fracture, durability of concrete structures, structural materials*

**Nikhil Gupta**, Associate Professor

PhD, Louisiana State University

*Multifunctional micro and nano-composites materials, Additive manufacturing, Sensing of damage and structural health monitoring*

**Debra Laefer**, Associate Professor

PhD, University of Illinois at Urbana-Champaign

*Geotechnical and structural engineering*

**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*

## **Assistant Professors**

**Joseph Chow**, Assistant Professor and Deputy Director of C2SMART

PhD, University of California, Irvine

*Transportation systems, multimodal networks, behavioral urban logistics, smart cities, transport economics*

**Semiha Ergan**, Assistant Professor

PhD, Carnegie Mellon University

*IT to support design, construction and operations of civil infrastructure systems, urban challenges for AEC/FM*

**Chen Feng**, Assistant Professor

PhD, University of Michigan

*Robotic vision and robotics for construction and civil engineering*

**Said Jabari**, Assistant Professor

PhD, University of Minnesota Twin Cities

*Traffic flow theory and dynamical modeling, real-time traffic analytics, network flows and sensor placement problems, applied probability and uncertainty quantification*

**Li Jin**, Assistant Professor

PhD, Massachusetts Institute of Technology

*Resilient operations of smart transportation systems*

**Constantine E. Kontokosta**, Assistant Professor of Urban Informatics

PhD, Columbia University

*Intersection or urban planning, data science, and systems engineering*

**Andrea Silverman**, Assistant Professor

PhD, University of California, Berkeley

*Detection and control of waterborne pathogens, wastewater and fecal sludge treatment for reuse, natural disinfection mechanisms*

**Cassandra Thiel**, Assistant Professor

PhD, University of Pittsburgh

## **Industry Assistant Professor**

**Jack Bringardner**, Industry Assistant Professor  
PhD, The University of Texas at Austin  
*Smart Cities Technology, Transportation*

## **Research Faculty**

**Stephan Bless**, Research Professor  
ScD, Massachusetts Institute of Technology  
*Granular mechanics, soil structure interaction, ballistics*

## **Senior Lecturer**

**Roula Maloof**, Senior 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 of 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

**Frank DarConte**, Research Professor  
PhD, NYU Tandon  
Vice President, The DeMatteis Organizations

**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 Prancel, 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 Lecturer 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**

**Mahmoud Ahmed**, Adjunct Professor  
PhD, Polytechnic Institute of New York University  
Project Engineer, New York State DOT

**Roy Messaros**, Adjunct Professor  
PhD, Stevens Institute of Technology  
US Army Corps of Engineers

**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



**Dan Westervelt**, Adjunct Professor  
PhD, Carnegie Mellon 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

**Roger P. Roess**, Professor Emeritus  
PhD, Polytechnic Institute of Brooklyn

# Department of Computer Science and Engineering

---

*Chair:* Guido Gerig

## 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 (i<sup>2</sup>e).

## 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 Minor

### *Master of Science*

- Computer Science, M.S.
- Cybersecurity, M.S.

### *Doctor of Philosophy*

- Computer Science, Ph.D.

## 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 within approximately 5 years.

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.

## 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*

#### **Guido Gerig**, Department Chair

PhD, Swiss Federal Institute of Technology Zurich (ETH-Z)  
*Image processing & analysis, medical image processing, 3D computer vision, shape analysis, spatiotemporal modeling*

#### **Lisa Hellerstein**

PhD, University of California at Berkeley  
*Computational learning theory, machine learning, algorithms, complexity theory, discrete mathematics*

#### **K. Ming Leung**

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

#### **Nasir Memon**

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*

#### **Torsten Suel**

PhD, University of Texas at Austin  
*Design and analysis of algorithms, database systems, parallel computation, experimental algorithmics*

### Associate Professors

#### **Juan Bello**

PhD, Queen Mary University of London  
*Digital signal processing, machine listening, music information retrieval*

#### **Enrico Bertini**

PhD, Sapienza University of Rome  
*Information Visualization, Human Computer Interaction*

#### **Justin Cappos**

PhD, University of Arizona

*Practical security, virtualization, cloud computing, software update systems, testbeds*

**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*

**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*

**Paul Torrens**

PhD, University College London

*Complex urban systems*

**Edward K. Wong**, Associate Professor of Computer Science

PhD, Purdue University

*Computer vision, image analysis, pattern recognition, computer graphics*

**Assistant Professors**

**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*

**Julia Stoyanovich**

PhD, Columbia University

*Responsible data management and analysis practices*

**Industry Faculty**

**Greg Aloupis**

PhD, McGill University

**Eugene Callahan**

PhD, Cardiff University

*Agent-based modeling, DevOps, Agile courseware*

**Jeffrey Epstein**

Cambridge University

**Haldun Hadimioglu**

PhD, Polytechnic University

*Computer architecture, parallel processing, reconfigurable systems and application specific processors*

**Meredith Mante**

Visiting Industry Professor

**Thomas Reddington**

MS Physics, University of Pittsburgh, PA

**Gustavo Sandoval**

MS, California State University at Sacramento

*Machine Learning, Distributed Systems, Operating Systems, Mobile applications, and Project Management*

**Linda Sellie**

*Machine Learning*

**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*

**Itay Tal**

MS, Tel-Aviv University

**Lecturers**

**Daniel Katz-Braunschweig**

MS, Iona College

Senior Lecturer

---



# Department of Electrical and Computer Engineering

---

*Chair:* Ivan Selesnick

## 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 21<sup>st</sup> 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 Technology 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

NYU Tandon School of Engineering  
Five MetroTech Center  
Brooklyn, NY 11201  
Tel: (646) 997-3590  
Fax: (646) 997-3906  
Web: <https://engineering.nyu.edu/ece/>

## 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; telecommunication networks; signal, image, and video processing; microwave engineering; wireless communications; power systems and energy conversion; plasma science and engineering; systems and control engineering; robotics; and nano-electronics.

## 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.

## Speciality 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, high-performance computing facility for data-driven and computationally-intensive tasks, 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, energy storage, demand-side management, 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**

**H. Jonathan Chao**, Professor of Electrical and Computer Engineering  
PhD, The Ohio State University

*Network security, high-performance routers, network on chip*

**Dariusz Czarkowski**, Professor of Electrical and Computer Engineering  
PhD, University of Florida  
*Power electronics and systems, electric drives*

**Elza Erkip**, Institute Professor and 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 Khorrani**, Professor of Electrical and Computer Engineering  
PhD, The Ohio State University  
*Robotics, control systems*

**Jelena Kovačević**, Professor of Electrical and Computer Engineering, Dean of NYU Tandon School of Engineering  
PhD, Columbia University  
*Signal processing, biomedical image analysis*

**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*

**Sundeep Rangan**, Professor of Electrical and Computer Engineering  
PhD, University of California, Berkeley  
*Wireless communication, signal processing and estimation, information theory*

**Theodore Rappaport**, David Lee/Ernst Weber Professor of Electrical Engineering  
PhD, Purdue University  
*Wireless communications*

**Ivan 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

**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*

**Ludovic Righetti**, Associate Professor of Electrical and Computer Engineering  
PhD, Ecole Polytechnique Fédérale de Lausanne (Switzerland)  
*Robotics*

**Peter Voltz**, Associate Professor of Electrical and Computer Engineering; Associate Dean for Undergraduate and Graduate Academics  
PhD, Polytechnic Institute of New York  
*Communications and signal processing*

## Assistant Professors

**Anna Choromanska**, Assistant Professor of Electrical and Computer Engineering  
PhD, Columbia University  
*Machine learning*

**Yury Dvorkin**, Assistant Professor of Electrical and Computer Engineering  
PhD, University of Washington  
*Smart grids*

**Siddharth Garg**, Assistant Professor of Electrical and Computer Engineering  
PhD, Carnegie Mellon University  
*Computer engineering*

**Giuseppe Loianno**, Assistant Professor of Electrical and Computer Engineering  
PhD, University of Naples Federico II  
*Robotics*

**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*

## Associated and Affiliated Faculty

**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*

**Juan Bello**, Associate Professor of Music Technology and Computer Science & Engineering at New York University  
PhD, Queen Mary University of London (UK)  
*Machine listening, music informatics*

**Leslie Greengard**, Silver Professor of Mathematics and Computer Science  
PhD, Yale University  
*Scientific computing, fast algorithms*

**Yann LeCun**, Silver Professor of Computer Science, Neural Science, and Electrical and Computer Engineering,  
PhD, Université Pierre et Marie Curie (France)  
*Machine learning, computer vision*

**Joel S. Schuman**, Professor, Ophthalmology; Professor, Neuroscience and Physiology; Professor, Electrical and Computer Engineering  
MD, Mount Sinai School of Medicine  
*Ophthalmology, optical coherence tomography*  
**Daniel Sodickson**, Professor, Radiology; Professor, Neuroscience and Physiology; Professor, Electrical and Computer Engineering  
PhD, Massachusetts Institute of Technology  
*Biomedical imaging, magnetic resonance imaging*

## Research Faculty

**David Chudnovsky**, Distinguished Research Professor of Electrical and Computer Engineering  
PhD, Ukrainian Academy of Sciences  
*VLSI, computer engineering, field theory, number theory*

**Gregory Chudnovsky**, Distinguished Research Professor of Electrical and Computer Engineering  
PhD, Ukrainian Academy of Sciences  
*VLSI, computer engineering, field theory, number theory*

**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*

## Industry Faculty

**Matthew Campisi**, Industry Assistant Professor of Electrical and Computer Engineering  
MS, Polytechnic University  
*Signal processing, medical imaging*

**Michael Knox**, Industry Professor of Electrical and Computer Engineering  
PhD, Polytechnic University  
*Wireless communications, RF and microwave components, analog-circuit design*

**Thomas Marzetta**, Distinguished Industry Professor of Electrical and Computer Engineering  
PhD, Massachusetts Institute of Technology  
*Wireless communication*

## Adjunct Faculty



**Zdzislaw Bochynski**, Adjunct Lecturer  
MS, Warsaw University of Technology

**John Carter**, Adjunct Lecturer  
PhD, New York University

**Xiao-Kang Chen**, Adjunct Lecturer  
PhD, Polytechnic University

**Robert DiFazio**, Adjunct Lecturer  
PhD, Polytechnic University

**Fraida Fund**, Adjunct Lecturer  
PhD, New York University

**Nina Krikorian**, Adjunct Lecturer  
MS, New York University

**Prashanth Krishnamurthy**, Adjunct Lecturer  
PhD, Polytechnic University

**Jonathan Mamou**, Adjunct Lecturer  
Phd, University of Illinois at Urbana-Champaign

**Richard Stern**, Adjunct Lecturer  
MS, Polytechnic University

**David Wang**, Adjunct Lecturer  
PhD, Polytechnic University

**Zhengxue Zhao**, Adjunct Lecturer  
PhD, Polytechnic University

## **Presidential Fellows**

**David J. Goodman**, NYU School of Engineering Presidential Fellow  
PhD, Imperial College, University of London (England)

**Dante C. Youla**, NYU School of Engineering Presidential Fellow  
MS, New York University

## **Faculty Emeriti**

**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

**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

**Frank A. Cassara**, Professor Emeritus of Electrical and Computer Engineering  
PhD, Polytechnic University

**David Chang**, Professor Emeritus of Electrical and Computer Engineering  
PhD, Harvard University

**Douglas A. Davids**, Associate Professor Emeritus of Electrical Engineering  
PhD, Johns Hopkins 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

**Theodore Tamir**, University Professor Emeritus  
PhD, Polytechnic Institute of Brooklyn

**Wen-Chung Wang**, Professor Emeritus of Electrical Engineering and Electrophysics  
PhD, Northwestern 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.

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, generates first-rate research and provides a first-rate education embedded in answering the real needs of the financial services sector.

The department's educational and MS degree-granting programs, research and extracurricular activities seek to bridge theory and practice and meet the many complex challenges confronting financial engineering professions. The department's curriculum combines a rigorous vision of economics, finance, applied quant finance, and financial technology in their theoretical and practical setting in a global world and global financial markets. In addition, the department provides interdisciplinary opportunities combining computer science, mathematics, and engineering with financial management and technology and financial and risk engineering.

Graduates have taken their places in a diverse set of positions in the financial engineering. Trading desks, hedge fund and investment professionals, CFOs, quantitative professionals, insurance experts, financial technology professionals, 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.

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.

## 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 monetary framework can profit by the application of financial engineering thought. In this spirit, our goal and objectives pertain to trading, speculating, investing, pricing and risk management but also to pricing and managing the risks of infrastructure, the environment, and business management. We meet the challenges of financial

122

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

Department of Finance and Risk Engineering  
NYU Tandon School of Engineering  
12 MetroTech Center, 26th Floor  
Brooklyn, NY 11201  
[engineering.fre@nyu.edu](mailto:engineering.fre@nyu.edu)  
Tel: 646.997.3279  
Fax: 646.997.3355  
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

### **Barry Blecherman**

Deputy Department Chair and Industry Professor

### **Agnes Tourin**

Industry Assistant Professor

## Adjunct Faculty

Sassan Alizadeh

Raphaelle Chappe

Jierong Cheng

Roy Freedman

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  
Jerzy Pawlowski  
Daniel Rodriguez  
Anatoly Schmidt  
Frederic Siboulet  
Ron Slivka  
Song Tang  
Daniel Totouom-Tangho  
Edward Dean Weinberger  
Jason Yarmish

---





## VICE-CHAIR FOR UNDERGRADUATE AFFAIRS AT CAS

Professor Matthew Leingang

## VICE-CHAIR FOR UNDERGRADUATE AFFAIRS AT TANDON

Professor Elizabeth Stepp

## Faculty

|                            |  |
|----------------------------|--|
| <u>Armstrong, Scott</u>    | Associate Professor of Mathematics<br>Partial differential equations, probability theory,<br>and stochastic homogenization   |
| <u>Avellaneda, Marco</u>   | Professor of Mathematics<br>Applied mathematics, mathematical modeling in<br>finance, probability  |
| <u>Bakhtin, Yuri</u>       | Associate Professor of Mathematics<br>Random dynamics, probabilistic models of<br>mathematical physics   |
| <u>Bandeira, Afonso S.</u> | Assistant Professor of Mathematics<br>Applied mathematics, optimization, probability,<br>information theory, signal processing,<br>mathematics of data science         |
| <u>Ben Arous, Gérard</u>   | Professor of Mathematics<br>Probability theory, stochastic processes, partial<br>differential equations  |
| <u>Berger, Marsha</u>      | Silver Professor of Computer Science and<br>Mathematics<br>Computational fluid dynamics, adaptive methods<br>for partial differential equations, parallel<br>computing |
| <u>Bogomolov, Fedor</u>    | Silver Professor of Mathematics<br>Algebraic geometry and related problems in<br>algebra, topology, number theory  |
| <u>Bourgade, Paul</u>      | Associate Professor of Mathematics<br>Probability, random matrices, statistical physics<br>and stochastic processes  |
| <u>Bühler, Oliver</u>      | Professor of Mathematics and Atmosphere/Ocean<br>Science   |

|                                 |  |
|---------------------------------|--|
|                                 | Geophysical fluid dynamics, interactions between waves and vortices, acoustics, statistical mechanics  |
| <u>Caflisch, Russel</u>         | Professor of Mathematics; Director, Courant Institute<br><br>Applied math, PDEs, fluid dynamics, plasma physics, materials science, Monte Carlo methods, computational finance |
| <u>Cappell, Sylvain E.</u>      | Silver Professor of Mathematics<br><br>Algebraic and geometric topology, symplectic and algebraic geometry   |
| <u>Cerfon, Antoine</u>          | Assistant Professor of Mathematics<br><br>Magnetohydrodynamics in fusion and astrophysical plasmas, nonneutral plasmas, kinetic theory in plasmas and rarefied gases           |
| <u>Cheeger, Jeff</u>            | Silver Professor of Mathematics<br><br>Differential geometry and its connections to analysis and topology  |
| <u>Chen, Yu</u>                 | Associate Professor of Mathematics<br><br>Numerical scattering theory, ill-posed problems, scientific computing  |
| <u>Deift, Percy A.</u>          | Silver Professor of Mathematics<br><br>Spectral theory and inverse spectral theory, integrable systems, Riemann-Hilbert problems   |
| <u>Donev, Aleksandar</u>        | Associate Professor of Mathematics<br><br>Multi-scale (hybrid) methods; fluctuating hydrodynamics; coarse-grained particle methods; jamming and packing                        |
| <u>Fernandez-Granda, Carlos</u> | Assistant Professor of Mathematics   |
| <u>Galichon, Alfred</u>         | Professor of Economics and Mathematics<br><br>Optimal transport, mathematical finance, economic equilibrium  |
| <u>Gerber, Edwin</u>            | Associate Professor of Mathematics and Atmosphere/Ocean Science<br><br>Atmospheric dynamics, climate variability, stochastic modeling  |
| <u>Germain, Pierre</u>          | Professor of Mathematics   |

|                               |   |
|-------------------------------|---|
|                               | Nonlinear partial differential equations, harmonic analysis   |
| <u>Giannakis, Dimitris</u>    | Assistant Professor of Mathematics<br>Atmosphere ocean science, geometric data analysis, uncertainty quantification   |
| <u>Goodman, Jonathan B.</u>   | Professor of Mathematics<br>Fluid dynamics, computational physics, computational finance  |
| <u>Greengard, Leslie</u>      | Silver Professor of Mathematics and Computer Science<br>Applied and computational math, partial differential equations, computational chemistry, mathematical biology |
| <u>Gromov, Mikhael</u>        | Jay Gould Professor of Mathematics<br>Riemannian manifolds, symplectic manifolds, infinite groups, math models of biomolecular systems                                |
| <u>Gunturk, C. Sinan</u>      | Professor of Mathematics<br>Harmonic analysis, information theory, signal processing  |
| <u>Hang, Fengbo</u>           | Associate Professor of Mathematics<br>Geometric analysis  |
| <u>Holland, David</u>         | Professor of Mathematics and Atmosphere/Ocean Science<br>Ocean-ice studies, climate theory and modeling   |
| <u>Holmes-Cerfon, Miranda</u> | Assistant Professor of Mathematics<br>Materials science, statistical mechanics, stochastic methods, computational geometry  |
| <u>Kleeman, Richard</u>       | Professor of Mathematics and Atmosphere/Ocean Science<br>Climate dynamics, El Nino, predictability of weather and climate dynamical systems                           |
| <u>Kleiner, Bruce</u>         | Professor of Mathematics<br>Geometric analysis, geometric group theory and geometric evolution equations  |

|                             |   |
|-----------------------------|---|
| <u>Kohn, Robert V.</u>      | Silver Professor of Mathematics<br>Nonlinear partial differential equations, materials science, mathematical finance  |
| <u>Lin, Fang-Hua</u>        | Silver Professor of Mathematics<br>Partial differential equations, geometric measure theory   |
| <u>Lubetzky, Eyal</u>       | Professor of Mathematics<br>Probability theory and combinatorics  |
| <u>Lutwak, Erwin</u>        | Professor of Mathematics; Deputy Chair for Tandon<br>Convex geometry, geometric and analytic inequalities   |
| <u>Majda, Andrew J.</u>     | Professor of Mathematics and The Samuel F. B. Morse Professor of Arts and Science<br>Modern applied mathematics, atmosphere/ocean science, partial differential equations |
| <u>Masmoudi, Nader</u>      | Professor of Mathematics<br>Nonlinear parallel differential equations   |
| <u>McKean, Henry P.</u>     | Silver Professor of Mathematics<br>Probability, partial differential equations, complex function theory   |
| <u>McLaughlin, David W.</u> | Silver Professor of Mathematics and Neural Science<br>Applied mathematics, nonlinear wave equations, visual neural science  |
| <u>Miller, Edward</u>       | Professor of Mathematics<br>Differential topology   |
| <u>Mishra, Bhubaneswar</u>  | Professor of Computer Science and Mathematics<br>Robotics, genomics, finance, mathematical and theoretical computer science   |
| <u>Mogilner, Alex</u>       | Professor of Mathematics and Biology<br>Computational Biology, Cell Biophysics and Mathematical Biology   |
| <u>Newman, Charles M.</u>   | Silver Professor of Mathematics   |

|                           |   |
|---------------------------|---|
|                           | Probability theory, statistical physics, stochastic models  |
| <u>O'Neil, Mike</u>       | Assistant Professor of Mathematics (joint appointment with NYU Tandon)<br><br>Electromagnetics, acoustics, fluid dynamics, fast algorithms, integral equations and computational statistics   |
| <u>Overton, Michael</u>   | Silver Professor of Computer Science and Mathematics<br><br>Numerical linear algebra, optimization, linear and semi-definite programming  |
| <u>Pauluis, Olivier</u>   | Professor of Mathematics and Atmosphere/Ocean Science<br><br>Climate and the general circulation of the atmosphere, moist convection, tropical meteorology, numerical modeling  |
| <u>Percus, Jerome K.</u>  | Professor of Mathematics and Physics<br><br>Chemical physics, mathematical biology  |
| <u>Peskin, Charles S.</u> | Silver Professor of Mathematics and Neural Science<br><br>Applications of mathematics and computing to problems in medicine and biology, cardiac fluid dynamics, molecular machinery within biological cells, mathematical/computational neuroscience |
| <u>Pirutka, Alena</u>     | Associate Professor of Mathematics<br><br>Arithmetic and algebraic geometry, number theory  |
| <u>Rangan, Aaditya</u>    | Associate Professor of Mathematics<br><br>Computational biology, numerical analysis   |
| <u>Rinzal, John</u>       | Professor of Neural Science and Mathematics<br><br>Computational neuroscience, nonlinear dynamics of neurons and neural circuits, sensory processing  |
| <u>Ristroph, Leif</u>     | Assistant Professor of Mathematics<br><br>Fluid dynamics, non-linear dynamics, experimental physics, biophysics, and geophysics   |
| <u>Serfaty, Sylvia</u>    | Silver Professor of Mathematics   |

|                                  |  |
|----------------------------------|--|
|                                  | Nonlinear Partial Differential Equations, Ginzburg-Landau equations, and variational problems from material science  |
| <u>Shatah, Jalal M. I.</u>       | Professor of Mathematics<br>Partial differential equations, analysis   |
| <u>Shelley, Michael J.</u>       | Professor of Mathematics, Neural Science, and Mechanical Engineering, and the Lilian and George Lytle Professor of Applied Mathematics<br>Applied math and modeling, visual neuroscience, fluid dynamics, computational physics and neuroscience |
| <u>Smith, K. Shafer</u>          | Associate Professor of Mathematics and Atmosphere/Ocean Science<br>Geophysical fluid dynamics, physical oceanography and climate   |
| <u>Spencer, Joel H.</u>          | Silver Professor of Mathematics and Computer Science<br>Discrete mathematics, theoretical computer science.  |
| <u>Sreenivasan, Katepalli R.</u> | Professor of Physics and Mathematics; Executive Vice Provost for Engineering and Applied Sciences, NYU<br>Turbulence, complex fluids, cryogenic helium and nonlinear dynamics  |
| <u>Stadler, Georg</u>            | Associate Professor of Mathematics<br>Parallel scientific computing, inverse problems, PDE-constrained optimization, variational inequalities, computational earth sciences  |
| <u>Stein, Daniel</u>             | Professor of Mathematics and Physics<br>Theoretical condensed matter physics, statistical mechanics, and mathematical physics  |
| <u>Tabak, Esteban G.</u>         | Professor of Mathematics<br>Dynamics of the atmosphere and ocean, energy transfer in systems with many degrees of freedom  |
| <u>Tranchina, Daniel A.</u>      | Professor of Biology, Mathematics, and Neural Science<br>Mathematical modeling in neuroscience   |



|                                  |   |
|----------------------------------|---|
| <u>Trefethen, Nick</u>           | Global Distinguished Professor of Mathematics and Computer Science  |
| <u>Tschinkel, Yuri</u>           | Professor of Mathematics<br>Algebraic geometry, number theory, automorphic forms  |
| <u>Vanden-Eijnden, Eric</u>      | Professor of Mathematics<br>Stochastic partial differential equations, statistical mechanics, turbulence theory                                   |
| <u>Varadhan, S. R. Srinivasa</u> | Professor of Mathematics and the Frank Jay Gould Professor of Science<br>Probability theory, stochastic processes, partial differential equations |
| <u>Wright, Margaret H.</u>       | Silver Professor of Computer Science and Mathematics<br>Optimization; scientific computing; linear algebra  |
| <u>Yang, Deane</u>               | Professor of Mathematics<br>Convex geometric analysis, Riemannian geometry, Partial differential equations  |
| <u>Yang, Yisong</u>              | Professor of Mathematics<br>Nonlinear Partial Differential Equations, Mathematical Physics, Applied Mathematics                                   |
| <u>Young, Lai-Sang</u>           | Silver Professor of Mathematics and the Henry & Lucy Moses Professor of Science<br>Dynamical systems and ergodic theory                           |
| <u>Young, Robert</u>             | Associate Professor of Mathematics<br>Geometric group theory, metric geometry, and quantitative geometry  |
| <u>Zeitouni, Ofer</u>            | Global Distinguished Professor of Mathematics   |
| <u>Zhang, Gaoyong</u>            | Professor of Mathematics<br>Convex geometry, Geometric analysis   |
| <u>Zhang, Jun</u>                | Professor of Physics and Mathematics<br>Fluid dynamics, biophysics, complex systems   |
| <u>Zorin, Denis</u>              | Professor of Computer Science and Mathematics   |

|  |  |
|--|--|
|  | Computer graphics; geometric modeling; subdivision surfaces; multiresolution surface representations; fluid and solid simulation; perceptually based methods for computer graphics |
|--|--|

## Contract Faculty

|                           |  |
|---------------------------|--|
| <u>Bhat, Vindya</u>       | Clinical Assistant Professor of Mathematics<br>Ramsey theory; combinatorics  |
| <u>Clarkson, Corrin</u>   | Clinical Assistant Professor of Mathematics  |
| <u>Hammoud, Naima</u>     | Clinical Assistant Professor of Mathematics  |
| <u>Kalaycioglu, Selin</u> | Clinical Associate Professor of Mathematics<br>Computational group theory, representation theory of finite groups, mathematics education   |
| <u>Kolm, Petter N.</u>    | Clinical Professor of Mathematics<br>Data science, econometrics, financial mathematics, machine learning, market making, optimization, portfolio optimization, quantitative & systematic trading, risk management, robo advisory & investing, smart beta strategies, stochastic optimal control, transaction costs, and tax-aware investing. |
| <u>Leingang, Matthew</u>  | Clinical Professor of Mathematics<br>Mathematics Education, Web Pedagogies, Differential Geometry  |
| Liu, Shizhu               | Clinical Assistant Professor of Mathematics  |
| <u>Majmudar, Trushant</u> | Clinical Assistant Professor of Mathematics<br>Bio-fluid Dynamics, bio-locomotion, soft condensed matter   |
| <u>Manocha, Harvansh</u>  | Industry Professor of Mathematics, Courant Tandon<br>Special Functions of Mathematical Physics, Lie Theory and Special Functions, Fractional calculus, Quantum Algebras and q-Functions  |
| <u>Medina, Luciano</u>    | Lecturer, Courant Tandon   |
| <u>Oveys, Hesam</u>       | Clinical Assistant Professor of Mathematics  |

|                             |   |
|-----------------------------|---|
|                             | Stochastic processes, branching processes, mathematical biology, mathematical finance, and partial differential equations   |
| <u>Patel, Jigarkumar</u>    | Clinical Assistant Professor of Mathematics   |
| <u>Qian, Jinghua</u>        | Senior Lecturer, Courant Tandon; Director of Freshman Mathematics for Tandon<br><br>Probability and stochastic processes, statistics, analysis                              |
| Sia, Charmaine              | Clinical Assistant Professor of Mathematics<br><br>Algebraic topology, homotopy theory, the theory of topological modular forms, structured ring spectra, forms of K-theory |
| <u>Sondjaja, Mutiara</u>    | Clinical Assistant Professor of Mathematics<br><br>Optimization; interior-point methods; operations research  |
| Stepp, Elizabeth            | Clinical Associate Professor of Mathematics<br><br>Point-Set Topology; Continuum Theory   |
| <u>Van Wagenen, Lindsey</u> | Senior Lecturer, Courant Tandon; Director of Sophomore Mathematics for Tandon<br><br>Dynamical systems, stochastic processes, nonlinear optics                              |
| <u>Wielaard, James</u>      | Industry Associate Professor, Courant Tandon<br><br>Mathematical biology  |
| <u>Zhao, Fang</u>           | Lecturer, Courant Tandon; Director of Precalculus Mathematics for Tandon  |

# 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.](#)
  - [Aerospace Engineering Minor](#)
  - [Biomechanical and Biosystems Engineering Minor](#)
  - [Nuclear Sciences and Engineering Interdisciplinary 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 for Research, Innovation and Entrepreneurship  
PhD, Univeritaet des Saarlandes, Germany  
*Atomic, molcular 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*

**Katepalli Sreenivasan**, Professor of Mechanical Engineering, NYU University Professor  
PhD, Indian Institute of Science  
*Fluid dynamics, turbulence, complex fluids, cryogenic helium, nonlinear dynamics*

### **Associate Professors**

**Nikhil Gupta**, Associate Professor of Mechanical Engineering  
PhD, Louisiana State University  
*Micro- and nano-composite materials/mechanics*

**Joo Hyun Kim**, Associate 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*

**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**

**Weiqliang Chan**, Assistant Professor of Mechanical and Aerospace Engineering  
PhD, University of Michigan

**Chen Feng**, Assistant Professor of Civil and Mechanical Engineering  
PhD, University of Michigan  
*Robotic Vision and Learning, with applications for Automation in Civil Engineering*

**Giuseppe Loianno**, Assistant Professor  
PhD, University of Naples Federico II

### **Industry and Research Professors**

**Rakesh Bahera**, Industry Assistant Professor  
PhD, University of Florida  
*Materials, Computational Materials Science*

**Joseph Borowiec**, Industry Professor  
PhD, Polytechnic Institute of New York  
*Finite elements method, structural mechanics, design*

**Nicholas Dizinno**, Industry Associate Professor  
MS, Polytechnic University  
*Computer-Aided Design, Thermal Sciences*

**Sang-Hoon Lee**, Industry Associate Professor  
PhD, Polytechnic University  
*Measurement systems and automatic control*

**Dung Luong**, Industry Assistant Professor  
PhD, Polytechnic Institute of NYU  
*Composite materials*

**Iskender Sahin**, Industry Professor  
PhD, Virginia Polytechnic Institute and State University  
*Thermal and fluid systems*

## **Adjunct Faculty**

**Shabab Baghaei**  
PhD, City University of New York  
*Mechanical Engineering*

**Ghania Benbelkacem**  
PhD, Institut national polytechnique de Lorraine  
*Fluid Mechanics, Heat Transfer, Material science*

**Huseyin Cekirge**  
PhD, Lehigh University  
*Applied Mechanics*

**Anthony Clarke**  
MS, Binghamton University  
*Finite Elements Methods*

**Matthew Frenkel**  
PhD, Rutgers University  
*Thermal Sensing, Applied Optics*

**Andrew Gadzic**  
MS, Polytechnic University  
*Manufacturing Engineering and Processes*

**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



**Ali Vedavarz**

PhD, Polytechnic University

*Energy systems, green energy, HVAC*

**Affiliated Faculty**

**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*

**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*

**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*

**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

**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

**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 18<sup>th</sup>- and 19<sup>th</sup>-century British novel, public speaking, expository writing*

**Beth Simone Noveck**

PhD, Political Science, University of Innsbruck

JD, Yale University

*Digital government, technology and democracy*

**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

## **Assistant Professor**

**Luke Dubois**, Assistant Professor of Integrated Digital Media  
PhD, Columbia University  
*Computer music, real-time multimedia*

**Elizabeth Marie Hénaff** Assistant Professor of Integrated Digital Media  
PhD, University of Barcelona  
*Biodesign, genomics, media & art, urban biome citizen science*

## **Industry Faculty**

**Amber Benezra**, Industry Assistant Professor of Anthropology, Director of Science and Technology Studies  
PhD, New School  
*Science and Technology Studies, ethnography of science and technology, urban biome*

**Tega Brain**, Industry Assistant Professor of Integrated Digital Media  
Master of Art (research) Creative Industries, Queensland University of Technology  
*Interaction design, environmental art and design, citizen science, art and engineering*

**De Angela Duff**, Industry Professor of Integrated Digital Media  
MFA, Maryland Institute College of Art  
*Web design, interaction design*

**Scott Fitzgerald**, Industry Professor of Integrated Digital Media  
MPS, New York University  
*Web design, interaction design*

**Dana Karwas**, Instructor in Integrated Digital Media  
MPS, New York University  
*Interaction design*

**Benedetta Piantella**, Industry Assistant in Integrated Digital Media  
MPS, New York University  
*Interaction design, technology in the developing world*

## **Lecturers**

**Donald S. Phillips**, Senior Lecturer in Natural History  
BS, Polytechnic University  
*Physical anthropology, paleontology, natural disasters*

**Allan Goldstein**, Senior Lecturer in English  
BA, University of Denver  
*Writing nonfiction/personal experience writing, disability studies*

**James P. Lewis**, Senior Lecturer in Psychology  
MA, Stony Brook University  
*Humanistic psychology*

**Alan M. Nadler**, Senior 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
- Harold P. Sjursen
- Romualdas Sviedrys

## **Humanities and Social Sciences Electives List**

Humanities and Social Sciences Electives List

---

# Department of Technology Management and Innovation

---

*Interim Chair:* Professor Jonathan Soffer

## 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

NYU Tandon School of Engineering  
Five MetroTech Center  
Brooklyn, NY 11201  
Tel: (646) 997-3760  
Fax: (646) 997-3874  
E-mail: [TMI@nyu.edu](mailto:TMI@nyu.edu)  
Web: <http://engineering.nyu.edu/academics/departments/technology>

## Degrees Offered

### *Bachelor of Science*

- Business and Technology Management, B.S. offered by the Business and Technology Management Program

### *Master of Science*

- Management of Technology, M.S. (MOT) offered by the Management of Technology Program
- Industrial Engineering, M.S. (IE) offered by the Industrial Engineering Program

### *Doctor of Philosophy*

- Technology Management, Ph.D. offered by the Technology Management Program



## 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 Tandon.

## Graduate 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 and IE programs either part time or full time with an evening schedule. Each has concentrations that allow students to specialize in selected areas.

We encourage and welcome prospective students to apply to our other thriving and innovative graduate programs: the Management of Technology (MOT) and Industrial Engineering (IE). 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 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 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.

## **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

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*

**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**

**Pavlos Mourdoukoutas**, Academic Director and Industry Professor

PhD, University of Connecticut

MS, Stony Brook University

### **Professional Staff**

**Bohdan Hoshovsky**, MSM and BS-BTM Academic and Administrative Program Director

PhD, Pacifica Graduate Institute

**Aric C. Meyer**, Academic Advisor - M.S. Management of Technology & M.S. Industrial Engineering

MED, Northeastern University

**Elizabeth Spock**, Academic Advisor  
MA, New York Univeristy

**Khidene David**, Program Coordinator

## **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*

**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 Pedro Nueno**

IESE

Barcelona, Spain

**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**, Industry Assistant Professor

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

---

Explore the typical course of study and other requirements for each academic program.

## Non-Degree

- [Aerospace Engineering Minor](#)
- [Applied Physics Minor](#)
- [Biomechanical and Biosystems Engineering Minor](#)
- [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](#)
- [Transportation Minor](#)
- [Urban Informatics Minor](#)

## Bachelor of Science

- [Applied Physics, B.S.](#)
- [Biomolecular Science, B.S.](#)
- [Business and Technology Management, B.S.](#)
- [Chemical and Biomolecular Engineering, B.S.](#)
- [Civil Engineering, B.S.](#)
- [Computer Engineering, 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, 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](#)
- [Traffic Engineering Advanced Certificate](#)
- [Transportation Management Advanced Certificate](#)
- [Transportation Planning Advanced Certificate](#)

### **Master of Science**

- [Applied Physics, M.S.](#)
- [Bioinformatics \(Online\), 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, 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 of Technology \(Online\)](#)
- [Management of Technology, 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, Fluid Dynamics and Thermal Systems, M.S.
- Mechanical Engineering, Mechanics and Structural Systems Specialty, M.S.
- Mechatronics and Robotics, 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.
  - Mechanical Engineering, Ph.D.
  - Technology Management, Ph.D.
  - Transportation Planning and Engineering, Ph.D.
-

# Non-Degree Programs



## 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 courses in place of two STEM<sup>2</sup> and two Free Electives available in the program. Please see [Mechanical Engineering, Aerospace Minor, B.S.](#) for more details.

**In order for the Minor to be awarded and recorded on the official student transcript, the student has to obtain an overall 2.00 GPA in the Minor courses.**

### 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

---

## Biomechanical and Biosystems Engineering Minor

---

The field of Biomedical Engineering (BME)/Bioengineering is at the interface of engineering, life sciences, technology, and medicine, and has been articulated as an ever more prominent field in the engineering and medical sciences. Engineers working in this specialty apply engineering principles to the medical and biological sciences to design and develop equipment, devices, computer systems, software, and molecular and cellular engineering tools used in the medical, biotechnological, and pharmaceutical fields.

The Minor was designed to provide students with a basic proficiency in fundamental core areas in the field of BME/Bioengineering. Students are required to take a total of 16 credits satisfied by five core courses in the Minor, as shown below. BMS-UY 1004 is an established course. All ME courses offered in this track are new.

### Required Courses:

---

- BMS-UY 1004 Introduction to Cell and Molecular Biology 4 Credits
- ME-UY 4623 Biomechanics 3 Credits
- ME-UY 4633 Biomaterials 3 Credits
- ME-UY 4643 Biofluid Mechanics 3 Credits
- ME-UY 4653 Introduction to BioMEMS and Microfluidics 3 Credits

### Note:

---

In order for the Minor to be awarded and recorded on the official student transcript, the student has to obtain an overall 2.00 GPA in the Minor courses.

### Contact Information:

---

Departmental Adviser: Joseph Borowiec

borowiec@nyu.edu

---

## **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](mailto:tommy.lee@nyu.edu), [ahs342@nyu.edu](mailto:ahs342@nyu.edu), [ev494@nyu.edu](mailto:ev494@nyu.edu), [bgaretz@nyu.edu](mailto:bgaretz@nyu.edu)

---

# Computer Engineering Minor

---

## Required Courses

---

Students may obtain a minor in Computer Engineering by taking the following courses:

- [ECE-UY 2004 Fundamentals of Electric Circuits](#) 4 Credits
- [CS-UY 2204 Digital Logic and State Machine Design](#) 4 Credits
- [ECE-UY 4144 Introduction to Embedded Systems Design](#) 4 Credits
- [CS-UY 2124 Object Oriented Programming](#) 4 Credits

OR

[ECE-UY 3114 Fundamentals of Electronics I](#) 4 Credits

(whichever is not required for the student's primary degree program)

**Total Credits: 16**

---

## Note:

---

For students not earning the BS degree in computer science, [ECE-UY 4144](#) may be replaced by [CS-UY 2214](#) Computer Architecture. Students should be aware of the prerequisites for the courses for the minor. 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. The minor in computer engineering is not open to students earning the BS degree in electrical engineering.

## Contact Information:

---

Departmental Adviser: Richard Toth

rtoth@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](#).<sup>1</sup> 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.<sup>2</sup>

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.

<sup>1</sup> 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.

<sup>2</sup> 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. 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 pre-requisite 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 [ECE-UY 3613 Communication Networks](#)

### Cybersecurity Minor Electives (3 Credits):

---

In addition to these four core courses, students must take 3 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 GPA of 2.0 or better in the entire minor is required. Also, a grade of C- or better is required in Circuits [ECE-UY 2004 OR ECE-UY 2013 and ECE-UY 2024 (Circuits I & II)].

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: Richard Toth

[rtoth@nyu.edu](mailto:rtoth@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 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.

## 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](mailto: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

---

### Requirements for Students Entering Tandon Fall 2018 or later:

A student not majoring in math or math/physics can obtain a minor in mathematics by fulfilling the following requirements:

- 16 credits of math courses
- At least 8 credits of math courses must be in addition to the major's math requirements
- At least 8 of the 16 credits must be taken while enrolled at Tandon
- Minimum 2.0 minor GPA

All courses used for the Minor in Mathematics must be pre-approved by the Math Department Advisor. Courses with similar content cannot be used towards the minor.

### Requirements for Students Entering Tandon Before Fall 2018:

A student not majoring in math or math/physics can obtain a minor in mathematics by fulfilling the following requirements:

- 15 credits of math courses
- At least 8 credits of math courses must be in addition to the major's math requirements
- At least 6 of the 8 credits must be taken while enrolled at Tandon
- Must take:
  - MA-UY 4613 Analysis I
  - MA-UY 4623 Analysis II
- Minimum 2.0 minor GPA

Students who entered Tandon before fall 2018 may choose to follow the new requirements listed above.

---

## 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 a student has taken an equivalent course in their own major (e.g., Statics in Civil Engineering), that course will not count toward the Minor. In such a case the student will need to complete an approved ME substitute course so that the total number of completed ME courses still equals 15 credits.

**Note: In order for the Minor to be awarded and recorded on the official student transcript, the student has to obtain an overall 2.00 GPA in the Minor courses.**

### 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 STEM<sup>2</sup>, Free, and/or Humanities electives.

**In order for the Minor to be awarded and recorded on the official student transcript, the student has to obtain an overall 2.00 GPA in the Minor courses.**

### 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:

---

- [ECE-UY 2613 Fundamentals of Electric Power Engineering for Non EE Students](#) *3 Credits*
- [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](mailto:jpl366@nyu.edu)

---

## Transportation Minor

---

Transportation systems continue to be the main driving force behind the on-going race towards building smart cities of tomorrow. In fact, transportation systems are being re-invented, re-engineered, and revolutionized at a rate that has never been seen in the history except the time motorized transportation replaced horse and buggy approximately 100 years ago. The purpose of the Civil and Urban Engineering undergraduate minor in Transportation is to open new avenues to NYU's undergraduate students from all disciplines to be involved in these exciting developments in transportation engineering and planning. The main educational goal is to provide students with the necessary foundations to use advanced analytical techniques and to employ emerging publicly available big data sources not only to analyze and evaluate existing transportation systems but also to plan and engineer future systems such as hyperloop and autonomous vehicles. Students will have the opportunity to learn to use advanced simulation and spatial data analysis and visualization tools to assess the effects of implementing alternative designs of these emerging transportation systems. The capstone course will be the culminating experience to work on exciting real-world projects with leading industry and agency partners under the guidance of transportation faculty with a wealth of academic and practical experience in transportation engineering and planning. Students involved in this minor will also have the opportunity to work on exciting research projects lead by the newly established USDOT Tier 1 University Transportation Center, C2SMART (<http://c2smart.engineering.nyu.edu>) Students are required to take a total of five classes.

The minor is open to undergraduate students. Transportation is a multidisciplinary field and undergraduates from other engineering departments, computer science, planners are all welcome to participate in this minor.

### Learning Objectives of the Transportation Minor:

- Introduce students to urban transportation planning principles.
- Develop foundational skills for evaluating transportation facilities.
- Enhance data-driven problem-solving capabilities and analytical reasoning skills.
- Understand how new technologies can be applied to addressing urban transportation challenges

### Required Courses

---

- CE-UY 3313 Introduction to Transportation Systems 3 Credits OR CE-UY 2343 Transportation Engineering 3 Credits
- CE-UY 4822 Civil Engineering Design II 2 Credits (Transportation Project Section)

### Electives

---

#### Undergraduate Courses

---

Students may choose any three elective courses from the following:

- CE-UY 3313 Introduction to Transportation Systems 3 Credits OR CE-UY 2343 Transportation Engineering 3 Credits
- CE-UY 3303 Traffic Engineering 3 Credits
- CE-UY 3333 Transportation Systems and Software 3 Credits
- CE-UY 3363 Transportation Economics 3 Credits
- CE-UY 3373 Transportation Systems Analytics 3 Credits

## Graduate Courses

---

Certain graduate courses in transportation, as well as courses from CUSP, are allowed for Junior- or Senior-level Students with cGPA>3.0 and approval of the Transportation Minor adviser.

## Contact Information

---

Departmental Adviser: Joseph Chow

joseph.chow@nyu.edu

---

## Urban Informatics Minor

---

The academic mission of the proposed undergraduate minor in Urban Informatics is to expose undergraduate students from across the University to the emergent field of data-driven urban studies. This includes the application of data acquisition and analytics to understanding the urban environment, infrastructure, operations, management, policy, design, planning, and population health. The goal is to offer students the necessary foundation to acquire and analyze information to solve critical challenges facing cities in the 21st century. Students will develop skills in data acquisition, data management, analysis, and visualization, as well as in data structure and privacy standards.

The minor is open to students across the University, including those in STEM fields, the humanities, the social sciences, and the arts. Given the cross-disciplinary nature of studies of cities, this minor will be of particular interest to students in disciplines such as sociology, public policy, public health, architecture/urban design, business, economics, and politics. Non-engineering students will gain quantitative skills for deeper understanding of cities in disciplinary areas of interest, while engineering students will benefit from specialized technical electives in data analytics. For both groups, the minor provides skills that are needed for data-driven analysis and critical thinking. This course of study will help prepare students for graduate study in a range of fields, as well as for work in government, the private sector, and nongovernmental organizations that focus on cities and urban living.

### Learning Objectives of the Urban Informatics Minor:

- Introduce students to the emerging fields of urban informatics and data science in the context of urban studies.
- Build foundational skills in data modeling, data manipulation, analysis, and visualization.
- Introduce students the applicable data standards for data representation and reasoning.
- Develop computing skills to enable future advanced studies in data applications to engineering.
- Enhance data-driven problem-solving capabilities and analytical reasoning skills.
- Understand how sensing technologies can be applied to better understand urban challenges, including city management and planning, and emergency response.

**In consultation and approval of the designated minor advisor, students will select from the following options:**

### Prerequisite (select 1)

---

- CUSP Urban Computing Skills
- CORE-UA.0109 Quantitative Reasoning: Mathematics & Computing
- MA-UY 2224 Data Analysis 4 Credits (or equivalent course in Statistics and Probability or quantitative social sciences)
- CE-UY XXXX Introduction to Computing and Visualization

### Core (minimum 2)

---



- CE-UY 4443 Sensing the City: Methods for Urban Health Monitoring 3 Credits (or substitute CE-GY 6053 Monitoring Cities)
- CE-UY 3383 Urban Informatics for Social Good 3 Credits
- OR maximum of one of below:  
  
CIP-UY 300X Vertically Integrated Projects (VIP-UY 300X)  
  
CE-UY 496X Undergraduate Research Project in Civil & Urban Engineering  
  
CE-UY xxxx. Senior Capstone

## Electives (3 courses needed)

---

- CE-UY 3373 Transportation Systems Analytics 3 Credits
- CS-UY 1134 Data Structures and Algorithms 4 Credits
- ECE-UY 4144 Introduction to Embedded Systems Design 4 Credits
- CS-UY 1114 Introduction to Programming and Problem Solving 4 Credits
- CS-GY 6313 Information Visualization 3 Credits

(Additional options including quantitative studies in social sciences and economics are possible upon approval of the minor advisor.)

## Note

---

In order for the Minor to be awarded and recorded on the official student transcript, the student has to obtain an overall 3.0 GPA in the minor courses.

## Contact Information

---

Minor Advisor: Professor Masoud Ghandehari

masoud@nyu.edu

---

# **Bachelor of Science**

# Applied Physics, B.S.

---

## 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 electives 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, Independant 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 Credits <sup>1</sup>  
or
- [CM-UY 1014 General Chemistry I](#) 4 Credits <sup>1</sup>
- [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 <sup>1</sup>
- or
- BMS-UY 1004 Introduction to Cell and Molecular Biology 4 Credits <sup>1</sup>
- 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 <sup>2</sup>

### 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 <sup>2</sup>

### Spring Semester: 16 Credits

---

- PH-UY 4364 Introduction to the Quantum Theory 4 Credits
- PH 2/3/4\*\*4 PH Elective 4 Credits
- MA 2/3/4\*\*4 Math Elective 4 Credits
- Humanities and Social Sciences Elective #3 4 Credits <sup>2</sup>
- 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\*\*3 PH 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 <sup>3</sup>
- 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 <sup>2</sup>

**Total credits required for the degree: 128**

---

## Footnotes

---

<sup>1</sup> Students may choose to take a two-semester sequence in chemistry, or a combination of a single semester of chemistry and a semester of biology.

<sup>2</sup> To gain some breadth and depth of knowledge, take courses in at least two disciplines and at least one course at an advanced level.

<sup>3</sup> [PH-UY 4994 Bachelor's Thesis in Physics](#) can be used to replace this course. Credit can be earned for either the thesis or project course, but not for both courses.

---

## Biomolecular Science, B.S.

---

### Typical Course of Study for the Bachelor of Science in Biomolecular Science

---

#### Freshman Year

---

##### Fall Semester: 17 Credits

---

- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits
- [CM-UY 1014 General Chemistry I](#) 4 Credits
- [BMS-UY 1004 Introduction to Cell and Molecular Biology](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits<sup>2</sup>
- [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: 16 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
- Humanities and Social Sciences Elective 4 Credits<sup>4</sup>
- [CS-UY 1133 Engineering Problem Solving and Programming](#) 3 Credits

##### Spring Semester: 16 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
  - Humanities and Social Sciences Elective 4 credits<sup>4</sup>

## Junior Year

---

### Fall Semester: 16 Credits

---

- BMS-UY 3114 Genetics 4 Credits<sup>5</sup>
- 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 Credits<sup>4</sup>

### Spring Semester: 16-17 Credits

---

- BMS-UY 3314 Advanced Cell and Molecular Biology I 4 Credits<sup>5</sup>
- CM-UY 3324 Biochemistry II 4 Credits
- CM-UY 4011 Information Sources for the Chemical Sciences 1 Credits
- Elective 3-4 credits<sup>6</sup>
- Humanities and Social Sciences Elective 4 credits<sup>4</sup>

## Senior Year

---

### Fall Semester: 14-16 Credits

---

- BMS-UY 4914 Undergraduate Research in Biomolecular Science 4 Credits<sup>7</sup>
- BMS-UY 4324 Advanced Cell and Molecular Biology II 4 Credits
- Elective 3-4 credits<sup>6</sup>
- Elective 3-4 credits<sup>6</sup>

### Spring Semester: 16 Credits

---

- BMS-UY 4924 Undergraduate Research in Biomolecular Science 4 Credits<sup>7</sup>
- Elective 3-4 credits<sup>6</sup>
- Elective 3-4 credits<sup>6</sup>
- Elective 3-4 credits<sup>6</sup>

## Total credits required for graduation: 128

---

## Footnotes

---

<sup>1</sup>Students placed by examination or an adviser into MA-914 must defer registration for MA-UY 1024; MA-UY 1024/1124 may be replaced with MA-UY1324/1424.

<sup>2</sup>CM-UY 1032 is not required and cannot be taken by transfer students or students changing major after the freshman year.

<sup>3</sup>CS-UY 1133 may be replaced with CS-UY 1114; either course satisfies the requirements

<sup>4</sup>Choice of Humanities and Social Sciences electives must conform to the Tandon requirements described in the Bulletin. At least one elective must be an ethics course, such as PL-UY 2144. At least one elective must be at the 3xxx/4xxx level. At least one elective must be a writing-intensive course labeled by “W” and must be taken at Tandon. Students may take a maximum of 4 courses or 16 credits at other schools of NYU.

<sup>5</sup>Students who wish to accelerate their progression through the Biology (BMS) requirements can take BMS-UY 3114 Genetics and BMS-UY 3314 Advanced Cell & Molecular Biology I earlier in their sophomore year instead of selecting an HuSS elective. However, this is a more difficult option which may not be suitable for everyone. A detailed discussion of the pros and cons with an academic advisor is highly recommended.

<sup>6</sup>Elective options:

(i) At least two technical electives must be selected from the following courses: BMS-UY (level 3 and 4), CM-UY (level 3 and 4), BT-GY, BE-GY and BI-GY (collectively referred to as “Group 1”).

(ii) At least two technical electives must be selected from the following courses: A Group 1 course (as defined above), MA-UY, CS-UY, PH-UY, CBE-UY or, with advisor’s permission a technical elective related to BMS major at another school of NYU (collectively referred to as “Group 2”). Students may take a maximum of 4 courses or 16 credits at other schools of NYU.

(iii) The remaining courses (up to 8 credits) are free electives, for example, a course related to management, finance, or media studies (advisor’s permission is required).

<sup>7</sup>Students electing senior research must take both semesters of research and write a BS thesis. Students may replace research and thesis with 8 credits of technical electives from Group 1 or Group 2, but at least one course must be chosen from Group 1.

**Residency requirements:** To satisfy residency requirements for the BS degree students must complete a minimum of 64 credits at the University in approved coursework. In addition, students must complete their final 32 credits at the University, unless approved for a special term abroad.

**NOTE:** 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.

### **Summary of requirements for the BS degree:**

#### Subject / Credits Required

- Chemistry / 31
- Biology / 22
- Research / 8
- Computational / 3
- Engineering and Technology Forum / 1
- Writing / 8
- Humanities and Social Science Electives / 16
- Mathematics / 8
- Physics / 11
- Electives / 20
- **TOTAL / 128**

# 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 a STEM program. It 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 is STEM based which 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 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 of Technology (MOT), or an 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 in Free Electives

\*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 when available. 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 <sup>14</sup> and <sup>15</sup>

### **Freshman Year**

---

#### **Fall Semester: 16 Credits**

---

- MA-UY 1054 Calculus I with Precalculus 4 Credits <sup>1a</sup>
- EXPOS-UA 1 Writing the Essay 4 Credits (Humanities and Social Sciences1) <sup>2</sup>
- CS-UY 1114 Introduction to Programming and Problem Solving 4 Credits
- Science Elective (1) 4 Credits <sup>3</sup>

#### **Spring Semester: 14 Credits**

---

- [MA-UY 1154 Calculus II with Precalculus](#) 4 Credits <sup>1b</sup>
- [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) <sup>2</sup>
- Science Elective(2) 3 Credits <sup>3</sup>

## Sophomore Year

---

See Footnotes <sup>11</sup>

### 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
- TCS CAM/STS/SEG Cluster Elective 4 Credits (Humanities and Social Sciences 3) <sup>8</sup>

### Spring Semester: 16 Credits

---

- [MG-UY 2524 Microeconomics](#) 4 Credits <sup>12</sup>
- [MG-UY 2304 Marketing](#) 4 Credits
- [MG-UY 2014 Operations Management](#) 4 Credits
- [MA-UY 2054 Applied Business Data Analysis I](#) 4 Credits <sup>13</sup>

## Junior Year

---

See Footnotes <sup>11</sup>

### 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
- [STS-UY 2144 Ethics and Technology](#) 4 Credits Credits (Humanities and Social Sciences 5) <sup>4</sup>
- Technical Elective 4 Credits <sup>7</sup>

### Spring Semester: 16 Credits

---

- [MG-UY 3404 Innovation Management](#) 4 Credits
- [MG-UY 3304 Introduction to Supply Chain Management](#) 4 Credits (Strat. Con.) <sup>10</sup>
- or
- [MG-UY 3214 Advanced Corporate Finance](#) 4 Credits (Fin. Con.) <sup>10</sup>
- Restricted Elective(1) 4 Credits <sup>5</sup>
- TCS CAM/STS/SEG Cluster Elective 4 Credits (Humanities and Social Sciences 6) <sup>2</sup>

## Senior Year

---

See Footnotes <sup>11</sup>

## Fall Semester: 16 Credits

---

- MG-UY 4004 Management Strategy in Technology Sectors 4 Credits (Strat.Con.)<sup>10</sup>  
or
- MG-UY 4214 Financial Strategy 4 Credits (Fin. Con.)<sup>10</sup>
- MG-UY 4404 Entrepreneurship 4 Credits<sup>6</sup>
- Restricted Elective (2) 4 Credits<sup>5</sup>
- BTM Mandatory TCS STS Cluster Elective 4 Credits<sup>8</sup> (Humanities and Social Sciences 7)<sup>2</sup>

## 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<sup>6</sup>
- Free Elective 3 or 4 Credits<sup>9</sup>
- TCS CAM/STS/SEG Cluster Elective 4 Credits (Humanities and Social Sciences 8)<sup>2</sup>

## Total credits required for graduation: 127 or 128

---

## Footnotes

---

<sup>1a</sup> 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.

<sup>1b</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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.

<sup>4</sup> STS-UY 2144 Ethics and Technology is mandatory for all BTM majors and counts toward HuSS credits.

<sup>5</sup> Restricted Electives are Tandon pre-approved courses in math, science, Humanities and Social Sciences (HuSS) ONLY. Computer Science courses may not be counted as Restricted Electives.

<sup>6</sup> Students with a 3.6 GPA or better in major at the end of junior year may substitute, when available, 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.

<sup>7</sup> Technical Electives can be chosen from pre-approved computer science, engineering, mathematics, chemistry, physics, bio-molecular sciences, digital media (DM-UY), and undergraduate finance (FIN-UY) courses from the Department of Finance and Risk Engineering which do not duplicate required MG-UY course content. Technical Electives do not count towards the General Education requirements.



<sup>8</sup> 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):

- STS-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
- SEG-UY 2124 Public Policy Issues and the Internet: A Global Perspective
- STS-UY 3234 The Phenomenon Of Life
- STS-UY 3254/W Philosophy of Science
- STS-UY 2294 Quantum Mechanics and Information
- PS-UY 2724 Human Factors in Engineering Design (TCS SEG Cluster 3 course)
- STS-UY 2634 Psychology of the Internet
- STS-UY 2644 Creativity and Innovation
- STS-UY 2664 Intelligence: Real and Artificial
- STS-UY 3604 Psychology of Internet Security
- STS-UY 1004 Science, Technology, and Society
- 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.

<sup>9</sup> A Free Elective is defined as any three or four credit course within NYU which is graded and not pass/fail.

<sup>10</sup> 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) and MG-UY 4004 (Management Strategy in Technology Sectors). Students electing the Technology and Innovation in Finance concentration of study must complete both MG-UY 3214 (Advanced Corporate Finance) taken first, and then MG-UY 4214 (Financial Strategy).

<sup>11</sup> 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.

<sup>12</sup> ECON-UA 2 Economic Principles II (Microeconomics) was replaced by MG-UY 2524 Microeconomics.

<sup>13</sup> With written permission from the NYU Tandon/Courant Dept. of Mathematics, MA-UY 2054 Applied Data Analysis may be substituted with MA-UY 2224 Data Analysis.

<sup>14</sup> Grandfathering rules may apply.

<sup>15</sup> This chart is for all BSBTM students Spring 2017 onward.

*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 core 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 an integrated set of core engineering courses that include engineering thermodynamics, conservation laws, reaction kinetics and engineering, unit operations 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 the 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 a truly 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 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.

Below is a typical sequence of courses taken for the Bachelor of Science in Chemical and Biomolecular Engineering. Adjustments to this sequence can be made for participation in study abroad programs, for transferring credits from other institutions, or for other considerations based on individual circumstances.

## 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 <sup>1</sup>
- [CM-UY 1004 General Chemistry for Engineers](#) 4 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits <sup>2</sup>
- [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 3334 Biochemistry for Engineers](#) 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 Credits<sup>3</sup>

### 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 Credits<sup>3</sup>

## 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 Credits<sup>3</sup>

### 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 Credits<sup>3</sup>

**Total credits required for graduation: 128**

---

## Footnotes

---

<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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 leaves 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](#).

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 four 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. 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](#);
3. 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. The cumulative average of 2.0 or better applies to all civil engineering courses excluding the civil elective courses; and
4. **Junior-level status minimum GPA in civil engineering courses:** After a student completes four semesters or 64 credits at NYU (whichever is earlier), the students must have at least a combined GPA of at least 2.3 (C+) in the following five required CE courses, all of which should be completed by this point: [CE-UY 1002 Introduction to Civil Engineering](#), [CE-UY 2113 Statics](#), [CE-UY 2343 Transportation Engineering](#), [CE-UY 2213 Fluid Mechanics and Hydraulics](#), and [CE-UY 2123 Mechanics of Materials](#). If a student has a combined GPA below 2.0 in the above five classes, that student will not be allowed to remain in the major. If a student has a GPA between 2.0 and 2.3, the student will be required to re-take at least one of the courses to raise the GPA to 2.3 before being allowed to enroll in some junior-level required CE courses. If the student has not yet completed all five of the courses, the student will be required to enroll in them that semester.

## 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 <sup>1</sup>
- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits <sup>1</sup>
- [MA-UY 2034 Linear Algebra and Differential Equations](#) 4 Credits <sup>1</sup>
- [MA-UY 2224 Data Analysis](#) 4 Credits <sup>1</sup>

### 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 Credits <sup>2</sup>

### 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 Credits <sup>3</sup>

### 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](#) 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 Transportation Engineering Elective (See Table 2) 3 Credits
- CE-UY XXXX Transportation Engineering Elective (See Table 2) 3 Credits

### Free Elective

---

- Free Elective 3 Credits <sup>4</sup>

### Total Credits for Degree: 129

---

### Footnotes for Table 1

---

<sup>1</sup> 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](#).

<sup>2</sup> Students may select a basic science elective from one of the following areas: biology, astrophysics and astronomy or geology and earth science.

<sup>3</sup> 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.”

<sup>4</sup> 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 2323 Traffic Engineering I](#) 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: 16/17 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

- Or CS-UY 1114 Introduction to Programming and Problem Solving 4 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
- MA-UY 2224 Data Analysis 4 Credits

## Junior Year

---

### Fall Semester: 15 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
- Humanities and Social Sciences Elective 4 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 *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.

---

Please note that the curriculum that follows applies to students who began classes in the Fall of 2016 or later. For students who entered the NYU Tandon School of Engineering prior to that date, please review the [curriculum and typical course schedule for students entering prior to Fall 2016](#).

### 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 Credits <sup>2</sup>
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits <sup>1</sup>
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits <sup>1</sup>
- [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 <sup>2</sup>
- [ECE-UY 1012 Introduction to Computer Engineering](#) 2 Credits <sup>1</sup>
- OR
- [CS-UY 1012 Introduction to Computer Engineering](#) 2 Credits <sup>1</sup>
- [EXPOS-UA 2 The Advanced College Essay](#) 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
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits

- CS-UY 2124 Object Oriented Programming 4 Credits<sup>2</sup>
- ECE-UY 2004 Fundamentals of Electric Circuits 4 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 Credits<sup>2</sup>
- ECE-UY 3114 Fundamentals of Electronics I 4 Credits

---

## Junior Year

---

### Fall Semester: 16 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
- ECE Elective 3 Credits
- ECE-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 Credits<sup>3</sup>
- ECE/CS Restricted Elective 3/4 Credits<sup>4</sup>
- ECE/CS Restricted Elective 3/4 Credits<sup>4</sup>

---

## Senior Year

---

### Fall Semester: 17/18 Credits

- ECE/CS 4XX3 Design Project I 3 Credits
- Humanities and Social Sciences Elective Course 4 Credits<sup>3</sup>
- Humanities and Social Sciences Elective Course 4 Credits<sup>3</sup>
- ECE/CS Restricted Elective 3/4 Credits<sup>4</sup>
- Free Elective 3 Credits

---

### Spring Semester: 16/17 Credits

- ECE/CS 4XX3 Design Project II 3 Credits
- ECE/CS Restricted Elective 3/4 Credits<sup>4</sup>
- ECE/CS Elective 3 Credits
- ECE/CS Elective 3 Credits
- Humanities and Social Sciences Elective Course 4 Credits<sup>3</sup>

---

**Total credits required for graduation: 128**



## Notes

---

**Note: A GPA (Technical) of at least 2.0 is required in all ECE and CS courses.**

<sup>1</sup> 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.

<sup>2</sup> Grades of at least C- are required in CS-UY 1114, CS-UY 1134, CS-UY 2124, CS-UY 2204, and ECE-UY 2004. C if repeated twice.

<sup>3</sup> 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***.

<sup>4</sup> An ECE/CS restricted elective is any course that a student has the pre-requisites for and is on the list of ECE/CS Restricted Electives announced by the Computer Science and Electrical Engineering Departments. Students must choose two (2) CS courses and two (2) ECE courses from the list of Restricted Electives which is updated by the two departments.

---

# 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 within 5 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.

**Note:** MA 2034 Linear Algebra and Differential Equations or another linear algebra course is recommended, but not required. Some CS electives have knowledge of linear algebra as a prerequisite. Students planning to take such electives should plan accordingly.

## 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 <sup>4</sup>
- 26 credits of free electives <sup>4</sup>

**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 <sup>1</sup>
- [EG-UY 1001 Engineering and Technology Forum](#) 1 Credits
- [EXPOS-UA 1 Writing the Essay](#) 4 Credits <sup>2</sup>
- [MA-UY 1024 Calculus I for Engineers](#) 4 Credits <sup>3</sup>
- [EG-UY 1003 Introduction to Engineering and Design](#) 3 Credits

#### Spring Semester: 17 Credits

---

- [CS-UY 1134 Data Structures and Algorithms](#) 4 Credits <sup>1</sup>
- [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 <sup>3</sup>

### Sophomore Year

---

#### Fall Semester: 15 Credits

---

- [CS-UY 2124 Object Oriented Programming](#) 4 Credits <sup>1</sup>
- [MA-UY 2314 Discrete Mathematics](#) 4 Credits
- Science Elective 3 Credits <sup>4</sup>
- Humanities and Social Sciences Elective 4 Credits <sup>5</sup>

#### 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 <sup>7</sup>
- Humanities and Social Sciences Elective 4 Credits <sup>5</sup>

### Junior Year

---

## Fall Semester: 17 Credits

---

- [CS-UY 3224 Operating Systems](#) 4 Credits
- CS Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits<sup>5</sup>
- Science Elective 3 Credits<sup>4</sup>
- Free Elective 3 Credits

## Spring Semester: 16 Credits

---

- CS Elective 3 Credits
- CS Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits<sup>5</sup>
- 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

---

<sup>1</sup> Grade of C- or better is required in [CS-UY 1114](#), CS-UY 1124/[CS-UY 1134](#), and CS-UY 2124/[CS-UY 2134](#).

<sup>2</sup> Students who are placed by examination or by an adviser into [MA-UY 914](#) must defer registration for [MA 1024](#).

<sup>3</sup> 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.

<sup>4</sup> 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.

<sup>5</sup> 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 & Science: 22 Credits

---

- CM-UY 1004 General Chemistry for Engineers 4 Credits
- CS-UY 1133 Engineering Problem Solving and Programming 3 Credits
- MA-UY 1024 Calculus I for Engineers 4 Credits <sup>1</sup>
- MA-UY 1124 Calculus II for Engineers 4 Credits
- MA-UY 2054 Applied Business Data Analysis I 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 <sup>2</sup>
- EXPOS-UA 2 The Advanced College Essay 4 Credits <sup>2</sup>
- Humanities/Social Sciences Electives 16 Credits <sup>3</sup>

#### Required Courses in Management, Economics, Finance or related coursework: 14 Credits

---

See Footnote <sup>4</sup>

- 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
- any Economics elective

- MG/EC/FIN Level 3xxx or 4xxx Elective *Various Credits*
- MG/EC/FIN Level 3xxx or 4xxx Elective *Various Credits*

## Required Courses in Engineering and Construction Management: 52 Credits

---

- EG-UY 1003 Introduction to Engineering and Design 3 Credits
- CE-UY 2113 Statics 3 Credits
- CE-UY 2123 Mechanics of Materials 3 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

## Total Credits for Degree: 128 Credits

---

### Footnotes for Table 1

---

<sup>1</sup> Students may substitute MA-UY 1324, which includes two additional contact hours, for MA-UY 1024.

<sup>2</sup> 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.

<sup>3</sup> 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.”

<sup>4</sup> As courses in this category vary among two, three and four credits, the remaining credits can be satisfied by any electives in this category.

## Typical Course of Study for the Bachelor of Science in Construction Management

---

### Freshman Year

---

#### Fall Semester: 15 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 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
- Any Economics Elective (ECON xxxx) 4 Credits
  - [MA-UY 2054 Applied Business Data Analysis I](#) 4 Credits
  - Humanities and Social Sciences Elective 4 Credits

### Junior Year

---

#### Fall Semester: 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
- Liberal Arts & Sciences Elective 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 Elective 3 or 4 Credits

## Senior Year

---

### Fall Semester: 16 Credits

---

- CE-UY 4513 Construction Project Administration 3 Credits
- CE-UY 4523 Structural Building Systems 3 Credits
- MG/EC/FIN Elective (3xxx or 4xxx) 2,3, or 4 Credits
- Liberal Arts & Sciences Elective 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 Elective (3xxx/4xxx) 3 or 4 Credits
- Liberal Arts and Sciences Elective 4 Credits

**Total credits required for the degree: 128**

---

---

## Electrical Engineering 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 of minimum 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 ECE-UY, CS-UY and ECE-GY courses.*

Please note that the curriculum that follows applies to students who began classes in the Fall of 2016 or later. For students who entered the NYU Tandon School of Engineering prior to that date, please review the curriculum and typical course schedule for students entering prior to Fall 2016.

### Typical Course of Study for the Bachelors of Science in Electrical Engineering 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 <sup>1</sup>
- EG-UY 1001 Engineering and Technology Forum 1 Credits <sup>1</sup>
- CS-UY 1114 Introduction to Programming and Problem Solving 4 Credits <sup>2</sup>
- 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
- ECE/CS 1012 Introduction to Computer Engineering 2 Credits OR ECE-UY 1002 Introduction to Electrical and Computer Engineering 2 Credits <sup>1</sup>
- CS-UY 1134 Data Structures and Algorithms 4 Credits <sup>2</sup>
- EXPOS-UA 2 The Advanced College Essay 4 Credits

#### Second Year

---

##### Fall Semester: 20 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 <sup>2</sup>
- ECE-UY 2004 Fundamentals of Electric Circuits 4 Credits <sup>2</sup>
- Humanities and Social Sciences Elective 4 Credits <sup>3</sup>

---

### 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 <sup>2</sup>
- ECE-UY 3114 Fundamentals of Electronics I 4 Credits

---

## Third Year

---

### Fall Semester: 17/18 Credits

- MA-UY 3113 Advanced Linear Algebra and Complex Variables 3 Credits
- ECE-UY 2233 Introduction to Probability 3 Credits OR MA-UY 2233 Introduction to Probability 3 Credits
- CS-UY 2214 Computer Architecture and Organization 4 Credits
- ECE-UY 3054 Signals and Systems 4 Credits <sup>2</sup>
- ECE Elective 3 Credits

---

### Spring Semester: 18/20 Credits

- CM-UY 1004 General Chemistry for Engineers 4 Credits
- ECE-UY 3604 Electromagnetic Waves 4 Credits
- Humanities and Social Sciences Elective 4 Credits <sup>3</sup>
- ECE/CS Restricted Elective 3/4 Credits <sup>4</sup>
- ECE/CS Restricted Elective 3/4 Credits <sup>4</sup>

---

## Fourth Year

---

### Fall Semester: 17/19 Credits

- ECE-UY 4001 ECE Professional Development and Presentation 1 Credits
- ECE/CS 4XX3 Design Project I 3 Credits
- ECE/CS Restricted Elective 3/4 Credits <sup>4</sup>
- ECE/CS Restricted Elective 3/4 Credits <sup>4</sup>
- Free Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits <sup>3</sup>

---

### Spring Semester: 16/17 Credits

- ECE/CS 4XX3 Design Project II 3 Credits

- ECE/CS/EL Elective 3 Credits
- ECE/CS/EL Elective 3 Credits
- ECE/CS Restricted Elective 3/4 Credits<sup>4</sup>
- Humanities and Social Sciences Elective 4 Credits<sup>3</sup>

## 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 1134, CS-UY 2124, CS-UY 2204, ECE-UY 2004, and ECE-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 ECE/CS restricted elective is any course that a student has the pre-requisites for and is on the list of ECE/CS Restricted Electives announced by the Computer Science and Engineering and Electrical and Computer Engineering Departments or on the list of ECE Restricted Electives announced by the Electrical and Computer Engineering Department.
    - Students must choose at least two (2) courses from the ECE Restricted Electives list.
    - Among the remaining three, students must one (1) CS course, one (1) EE course, and one from CS or ECE from the set of CS Restricted Electives and ECE Restricted Electives both of which are updated by the two departments.
-

# Electrical Engineering, B.S.

---

Please note that the curriculum that follows applies to students who began classes in the Fall of 2016 or later. For students who entered the NYU Tandon School of Engineering prior to that date, please review the [curriculum and typical course schedule for students entering prior to Fall 2016](#).

## Typical Course of Study for the Bachelor of Science in Electrical 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 Credits<sup>5</sup>
- [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
- [ECE-UY 1002 Introduction to Electrical and Computer Engineering](#) 2 Credits<sup>1</sup>
- [EXPOS-UA 2 The Advanced College Essay](#) 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
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [ECE-UY 2004 Fundamentals of Electric Circuits](#) 4 Credits<sup>4</sup>
- [CS-UY 2204 Digital Logic and State Machine Design](#) 4 Credits<sup>4</sup>



## 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
- ECE-UY 3114 Fundamentals of Electronics I 4 Credits
- CS-UY 2164 Introduction to Programming in C 4 Credits

## Junior Year

---

### Fall Semester: 17 Credits

---

- MA-UY 3113 Advanced Linear Algebra and Complex Variables 3 Credits
- ECE-UY 2233 Introduction to Probability 3 Credits
- ECE-UY 3054 Signals and Systems 4 Credits <sup>4</sup>
- EE Elective 3 Credits
- Humanities and Social Sciences Course 4 Credits <sup>2</sup>

### Spring Semester: 16 Credits

---

- ECE-UY 3604 Electromagnetic Waves 4 Credits
- EE Restricted Elective 4 Credits <sup>3</sup>
- EE Restricted Elective 4 Credits <sup>3</sup>
- Humanities and Social Sciences Course 4 Credits <sup>2</sup>

## Senior Year

---

### Fall Semester: 15 Credits

---

- EE 4XX3 Design Project I 3 Credits
- ECE-UY 4001 ECE Professional Development and Presentation 1 Credits
- EE Restricted Elective 4 Credits <sup>3</sup>
- EE/EL Elective 3 Credits
- Humanities and Social Sciences Course 4 Credits <sup>2</sup>

### 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 Credits <sup>2</sup>

## Total credits required for the degree: 128

---

## Notes

---

<sup>1</sup> For transfer students and students changing major, ECE-UY 1002 is not required.

<sup>2</sup> Choice of Humanities and Social Sciences courses must conform to university requirements.

<sup>3</sup> The Restricted Electives must be 3 of 4 courses:

- ECE-UY 3124 Fundamentals of Electronics II
- ECE-UY 3824 Electric Energy Conversion Systems
- ECE-UY 3404 Fundamentals of Communication Theory
- ECE-UY 3064 Feedback Control

<sup>4</sup> A grade of at least C- is required in CS-UY 1114 or CS-UY 1133, CS-UY 2204, ECE-UY 2004, and ECE-UY 3054.

<sup>5</sup> CS-UY 1114 is strongly recommended, but CS-UY 1133 is also acceptable (for students changing major to EE, etc.).

---

# 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 Processes

4 Credits

234

## 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](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.

---

### Goals and Objectives:

- Command of core areas in both pure and applied mathematics, including but not limited to real and complex analysis, linear algebra, ordinary and partial differential equations.
- Mastery of a particular applied or engineering field and how mathematics is used in that field.
- Readiness for a variety of career options following graduation, including, but not limited to graduate study in applied mathematics, engineering, medicine, as well as professional careers in consulting, business & finance, and technology.

### Rationale:

The Tandon B.S. in Mathematics program is designed to provide a student with the knowledge and skills needed to both start a career in a mathematically-oriented field and adapt easily to changes in both the field and one's career directions. The program has the following components:

- A core set of required fundamental mathematics courses
- Mathematics electives
- A cohesive set of courses that focus on a particular field of engineering or applied science. The student works together with their advisor to choose these courses appropriately.

Students must complete 121 credits, as defined below, to graduate from the NYU Tandon School of Engineering with a Bachelor of Science in Mathematics. Please be aware that due to the merger of the Tandon Mathematics Department with the Courant Institute of Mathematical Sciences, some math courses have changed from 3 credits to 4 credits. However, this does not change the required math courses for the degree. Please note that the curriculum that follows applies to students who begin classes in the Fall of 2017 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 2017.

The NYU Tandon School of Engineering also offers a Physics and Mathematics, B.S. which is a dual major in both subjects.

## Requirements for the Bachelor of Science

---

### Core Mathematics Requirements: 41 Credits

---

- 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 1533 / MA-UY 3044 Linear Algebra 3-4 Credits
- MA-UY 2114 Calculus III: Multi-Dimensional Calculus 4 Credits
- MA-UY 4613 / MA-UY 4614 Applied Analysis 3-4 Credits
- MA-UY 3083 / MA-UY 4204 Ordinary Differential Equations 3-4 Credits

237

- MA-UY 2233 Introduction to Probability 3 Credits OR MA-UY 3014 Applied Probability 4 Credits
- MA-UY 4413 / MA-UY 4414 Applied Partial Differential Equations 3-4 Credits
- MA-UY 4433 / MA-UY 4434 Applied Complex Variables 3-4 Credits
- MA-UY 4113 / MA-UY 4114 Applied Statistics 3-4 Credits
- MA-UY 4423 / MA-UY 4424 Numerical Analysis 3-4 Credits
- MA-UY 2393 / MA-UY 4444 Intro to Math Modeling 3-4 Credits

## Other Required Courses: 28 Credits

---

- EG-UY 1001 Engineering and Technology Forum 1 Credits
- CS-UY 1114 Introduction to Programming and Problem Solving 4 Credits
- CM-UY 1004 General Chemistry for Engineers 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

## Math Electives: 9 Credits

---

Students should select three math elective courses totaling at least 9 credits.

## Other Electives: 28 Credits

---

- Students are required to take 16 credits in the humanities and social sciences.

**Note:** EXPOS-UA 1 and EXPOS-UA 2 do not count toward the Humanities and Social Sciences Elective requirement of 16 credits.

- 12 credits are reserved for free electives, with advisor's approval.

## Required Engineering Components: 15 credits

---

Students should select five engineering courses totaling at least 15 credits in Engineering Components. The Engineering Component of the B.S. in Mathematics Program must be in at least one of the following disciplines:

- Chemical and Biomolecular Engineering
- Civil Engineering
- Computer Engineering
- Computer Science
- Electrical Engineering
- Mechanical Engineering

Interdisciplinary components involving two or more of the fields above will be considered. The courses comprising a math major's engineering component must be approved in advance by an official Mathematics Department advisor.

Sample engineering courses in Engineering Components are listed after the next section.

## Total: 121 Credits

---

# Typical Course of Study for the Bachelor of Science in Mathematics

---

## Freshman Year

---

### Fall Semester: 15 Credits

---

- [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
- [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

### Spring Semester: 15 Credits

---

- [MA-UY 1124 Calculus II for Engineers](#) 4 Credits OR [MA-UY 1424 Integrated Calculus II for Engineers](#) 4 Credits
- [PH-UY 1013 Mechanics](#) 3 Credits
- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits
- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits

## Sophomore Year

---

### Fall Semester: 14 Credits

---

- MA-UY 1533 / [MA-UY 3044 Linear Algebra](#) 3-4 Credits
- [PH-UY 2121 General Physics Laboratory I](#) 1 Credits
- [PH-UY 2023 Electricity, Magnetism and Fluids](#) 3 Credits
- Humanities and Social Sciences Elective #1 4 Credits
- Engineering Course #1 3 credits

### Spring Semester: 15 Credits

---

- [MA-UY 2114 Calculus III: Multi-Dimensional Calculus](#) 4 Credits
- [PH-UY 2131 General Physics Laboratory II](#) 1 Credits
- [PH-UY 2033 Waves, Optics and Thermodynamics](#) 3 Credits
- Humanities and Social Sciences Elective #2 4 Credits
- Engineering Course #2 3 credits

## Junior Year

---

### Fall Semester: 16 Credits

---

- MA-UY 4613 / [MA-UY 4614 Applied Analysis](#) 3-4 Credits
- MA-UY 3083 / [MA-UY 4204 Ordinary Differential Equations](#) 3-4 Credits
- Humanities and Social Sciences Elective #3 4 Credits
- Engineering Course #3 3 Credits
- Free Elective #1 3 Credits



## Spring Semester: 16 Credits

---

- [MA-UY 2233 Introduction to Probability](#) 3 Credits OR [MA-UY 3014 Applied Probability](#) 4 Credits
- MA-UY 4413 / [MA-UY 4414 Applied Partial Differential Equations](#) 3-4 Credits
- MA-UY 4433 / [MA-UY 4434 Applied Complex Variables](#) 3-4 Credits
- Humanities and Social Sciences Elective #4 4 Credits
- Engineering Course #4 3 Credits

## Senior Year

---

### Fall Semester: 15 Credits

---

- MA-UY 4113 / [MA-UY 4114 Applied Statistics](#) 3-4 Credits
- MA-UY 4423 / [MA-UY 4424 Numerical Analysis](#) 3-4 Credits
- Engineering Course #5 3 Credits
- Math Elective #1 3 Credits
- Free Elective #2 3 Credits

### Spring Semester: 15 Credits

---

- MA-UY 2393 / [MA-UY 4444 Intro to Math Modeling](#) 3-4 Credits
- Math Elective #2 3 Credits
- Math Elective #3 3 Credits
- Free Elective #3 3 Credits
- Free Elective #4 3 Credits

## Total credits required for the degree: 121 Credits

---

## Sample Engineering Components

---

### Chemical & Biomolecular Engineering

---

- [CBE-UY 1002 Introduction to Chemical and Biomolecular Engineering](#) 2 Credits
- [CBE-UY 2124 Analysis of Chemical and Biomolecular Processes](#) 4 Credits
- [CBE-UY 3153 Chemical and Biomolecular Engineering Thermodynamics](#) 3 Credits
- [CBE-UY 3313 Transport I](#) 3 Credits
- [CBE-UY 3323 Transport II](#) 3 Credits

### Civil Engineering

---

- [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 3122 Structural Dynamics](#) 2 Credits
- [CE-UY 3133 Structural Analysis](#) 3 Credits
- [CE-UY 2343 Transportation Engineering](#) 3 Credits

### Computer Engineering

- 
- [CS-UY 1114 Introduction to Programming and Problem Solving](#) 4 Credits
  - [ECE-UY 1012 Introduction to Computer Engineering](#) 2 Credits
  - [ECE-UY 2013 Fundamentals of Electric Circuits I](#) 3 Credits
  - [ECE-UY 2024 Fundamentals of Electric Circuits II](#) 4 Credits
  - [CS-UY 2204 Digital Logic and State Machine Design](#) 4 Credits

## Computer Science

---

- [CS-UY 2124 Object Oriented Programming](#) 4 Credits
- [CS-UY 1134 Data Structures and Algorithms](#) 4 Credits
- [CS-UY 2413 Design and Analysis of Algorithms](#) 3 Credits
- CS-UY 2xxx or Upper Level Elective 4 Credits

## Electrical Engineering

---

- [ECE-UY 2013 Fundamentals of Electric Circuits I](#) 3 Credits
- [ECE-UY 2024 Fundamentals of Electric Circuits II](#) 4 Credits
- [ECE-UY 3054 Signals and Systems](#) 4 Credits
- [ECE-UY 3114 Fundamentals of Electronics I](#) 4 Credits
- [ECE-UY 3124 Fundamentals of Electronics II](#) 4 Credits

## Mechanical Engineering

---

- [ME-UY 2813 Introduction to Materials Science](#) 3 Credits
  - [ME-UY 2811 Materials Science Laboratory](#) 1 Credits
  - [ME-UY 2213 Statics](#) 3 Credits
  - [ME-UY 2211 Statics Laboratory](#) 1 Credits
  - [ME-UY 3333 Thermodynamics](#) 3 Credits
  - [ME-UY 3213 Mechanics of Materials](#) 3 Credits
  - [ME-UY 3313 Fluid Mechanics](#) 3 Credits
-

# 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 <sup>1</sup>

#### 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 Credits<sup>1</sup>

### 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
- STEM<sup>2</sup> Elective 3 Credits<sup>2</sup>

## 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
- STEM<sup>2</sup> Elective 3 Credits<sup>2</sup>
- Humanities and Social Sciences Elective 4 Credits<sup>1</sup>

### Spring Semester: 16 Credits

---

- [ME-UY 4113 Senior Design II](#) 3 Credits
- Free Elective 3 Credits<sup>3</sup>
- Free Elective 3 Credits<sup>3</sup>
- Free Elective 3 Credits<sup>3</sup>
- Humanities and Social Sciences Elective 4 Credits<sup>1</sup>

**Total credits required for the degree: 131 Credits**

---

## Footnotes

---

<sup>1</sup> 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 (HuSS) 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.”

<sup>2</sup> STEM<sup>2</sup> electives are satisfied by the following courses:

- a) Any level 2 or higher course starting with the prefix AE-UY, BMS-UY, CBE-UY, CM-UY, CE-UY, CS-UY, ECE-UY, FIN-UY, DM-UY, MA-UY, ME-UY, MG-UY, PH-UY, STS-UY, or VIP-UY
- b) Any graduate course starting with BE-GY, BI-GY, BT-GY, BTE-GY, CBE-GY, CM-GY, CE-GY, CS-GY, FRE-GY, DM-GY, IE-GY, MG-GY, MA-GY, ME-GY, or TR-GY
- Any course which satisfies Humanities credit must be in excess of the NYU Tandon 24 credit Humanities and Social Sciences (HuSS) requirement to be eligible for STEM<sup>2</sup> elective credit. Double-counting HuSS credit and STEM<sup>2</sup> credit is not permitted.

<sup>3</sup> 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 4424 Numerical Analysis](#) 3-4 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.

245

- [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 4613 Analysis I](#) 3 Credits
- [MA-UY 4623 Analysis II](#) 3 Credits

---

## Free Electives, Independant 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; or an applied physics thesis up to 8 credits.

---

## 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: 16 Credits**

---

- STS-UY 1004/W Science, Technology, and Society 4 Credits
- STS-UY 3004/W Seminar in Science and Technology Studies 4 Credits
- STS-UY 4034 Internship 4 Credits
- STS-UY 4002 Capstone Project I in Science and Technology Studies 2 Credits
- STS-UY 4202 Capstone Project II in Science and Technology Studies 2 Credits

### **(b) Restricted Electives: 24 Credits**

---

6 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: 16 Credits**

---

- STS-UY 1004/W Science, Technology, and Society 4 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 3004/W Seminar in Science and Technology Studies 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 4034 Internship 4 Credits
- STS Elective 3 4 Credits
- Tech/Sci Elective 6 4 Credits
- Free Elective 5 4 Credits

### Spring Semester: 12 Credits

---

- STS Elective 4 4 Credits
- Free Elective 6 4 Credits
- Tech/Sci Elective 7 4 Credits

## Senior Year

---

### Fall Semester: 13 Credits

---

- STS-UY 4002 Capstone Project I in Science and Technology Studies 2 Credits
- STS Elective 5 4 Credits
- STS Elective 6 4 Credits
- Tech/Sci Elective 8 3 Credits

### Spring Semester: 14 Credits

---

- STS-UY 4202 Capstone Project II in Science and Technology Studies 2 Credits
- STS Elective 7 4 Credits
- Free Elective 7 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.

# Sustainable Urban Environments, B.S.

---

## Bachelor of Science Degree Requirements

---

SUE majors take 120 credits, divided into three parts:

### General Education Requirements: 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
- **(8) Credits of Science:**

General Science Elective 4 Credits and URB-UY 2334 Introduction to Environmental Sciences

- **(4) Credits of Statistics- Choose one of the following:**

MA-UY 2414 Basic Practice of Statistics or MA-UY 2224 Data Analysis or

(CAS) ECON-UA 18, Statistics or (CAS) CORE-UA 105, Quantitative Reasoning: Elementary Statistics or

(CAS) PSYCH-UA 10, Statistics for the Behavioral Sciences or (CAS) SOC-UA 302, Statistics for Social Research

### Humanities and Social Sciences General Education Requirements: 24 credits

---

- EXPOS-UA 1 Writing the Essay 4 Credits
- EXPOS-UA 2 The Advanced College Essay 4 Credits
- 4 Humanities and Social Sciences courses, including at least one course of Level 3 and one Writing Intensive course

### Sustainable Urban Environments Requirements

---

#### A. Core: 33 Credits

---

- CE-UY 1002 Introduction to Civil Engineering 2 Credits
- URB-UY 2004 Global Perspectives on Urban Sustainability 4 Credits
- URB-UY 2024/W Design of Cities 4 Credits
- URB-UY 2044 Methods for Studying Urban Environments 4 Credits
- URB-UY 2054/W Introduction to Urban Policy 4 Credits
- HI-UY 3034 Introduction to Urban Infrastructure History 4 Credits

250

- [URB-UY 4012 Capstone Project I 2 Credits](#)
- [URB-UY 4022 Capstone Project II 2 Credits](#)
- [URB-UY 4034 Internship 4 Credits](#)

And one of the following Civil Engineering courses:

- [CE-UY 2323 Traffic Engineering I 3 Credits](#)
- [CE-UY 3313 Introduction to Transportation Systems 3 Credits](#)
- [CE-UY 3363 Transportation Economics 3 Credits](#)
- [CE-UY 4033 Introduction to Urban Infrastructure Systems Management 3 Credits](#)
- [CE-UY 4043 Sustainable Cities 3 Credits](#)

## **B. Tracks: 4 Courses, 16 Credits**

---

Students should Select at least 1 course from each 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 2114 Geographic Information Systems 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 2224 Natural Environment of New York City 4 Credits](#)
- [URB-UY 2234 Natural Environmental Catastrophes and Cities 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](#)

### **Other**

---

- [URB-UY 3834 Special Topics in Sustainable Urban Environments 4 Credits](#)
- [URB-UY 401X SUE Global Experience 1-4 Credits](#)

## Electives Requirement

---

### A. Technical Electives: 7 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. Students may choose 3 or 4 credit courses.

\*Technical elective overload may be applied to free credits.

### B. Free Electives: 20 Credits

---

Students may choose 5 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: 12 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
- SUE Track Course 4 Credits

#### Spring Semester: 14 Credits

---

- [EXPOS-UA 2 The Advanced College Essay](#) 4 Credits
- [CE-UY 1002 Introduction to Civil Engineering](#) 2 Credits
- [URB-UY 2004 Global Perspectives on Urban Sustainability](#) 4 Credits
- Humanities and Social Sciences Elective 4 Credits

### Second Year

---

#### Fall Semester: 16 Credits

---

- [URB-UY 2024 Design of Cities](#) 4 Credits
- [URB-UY 2334 Introduction to Environmental Sciences](#) 4 Credits
- SUE Track Course 4 Credits
- Humanities and Social Science Elective 4 Credits

#### Spring Semester: 15 Credits

---

- [CE-UY 3303 Traffic Engineering](#) or [CE-UY 3313 Introduction to Transportation Systems](#) or [CE-UY 4033 Introduction to Urban Infrastructure Systems Management](#) or [CE-UY 3363 Transportation Economics](#)
- [URB-UY 2044 Methods for Studying Urban Environments](#) 4 Credits
- SUE Track Course 4 Credits
- [MA-UY 2414 Basic Practice of Statistics](#) 4 Credits or [MA-UY 2224 Data Analysis](#) or ECON-UA 18- Statistics or CORE-UA 105- Quantitative Reasoning: Elementary Statistics or PSYCH-UA 10- Statistics for the Behavioral Sciences or SOC-UA 302- Statistics for Social Research

## Third Year

---

### Fall Semester: 16 Credits

---

- Free Elective 4 Credits
- Free Elective 4 Credits
- SUE Track Course 4 Credits
- [URB-UY 4034 Internship](#) 4 Credits

### Spring Semester: 16 Credits

---

- [URB-UY 2054/W Introduction to Urban Policy](#) 4 Credits
- Free Elective 4 Credits
- General Technical Elective 4 Credits
- [HI-UY 3034/W History of New York's Urban Infrastructure](#) 4 Credits

## Fourth Year

---

### Fall Semester: 17 Credits

---

- SUE Track Course 4 Credits
- Humanities and Social Sciences Elective 4 Credits
- General Technical Elective 3 Credits
- Humanities and Social Sciences Elective 4 Credits
- [URB-UY 4012 Capstone Project I](#) 2 Credits

### Spring Semester: 14 Credits

---

- [URB-UY 4022 Capstone Project II](#) 2 Credits
- Free Elective 4 Credits
- Free Elective 4 Credits
- General Technical Elective 4 Credits

**Total credits required for the degree: 120**

---

# Graduate Certificate

## 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.

Students who earn a Bioinformatics Advanced Certificate may apply those credits (up to nine) towards the Bioinformatics Master's Degree.

### Curriculum

---

#### 4 Required Courses (12 Credits)

---

##### Required Core Courses (9 Credits)

---

- [BI-GY 7653 Next Generation Sequence Analysis](#) 3 Credits

##### Elective Courses (3 Credits)

---

Please choose 1 elective.

- [BI-GY 7633 Transcriptomics](#) 3 Credits
  - [BI-GY 7683 Biology and Biotechnology for Bioinformatics](#) 3 Credits
  - [BI-GY 7693 Population Genetics and Evolutionary Biology](#) 3 Credits
  - [BI-GY 7733 Translational Genomics and Computational Biology](#) 3 Credits
  - [BI-GY 7743 Machine Learning and Data Science for Bioinformatics](#) 3 Credits
  - [BI-GY 7673 Applied Biostatistics for Bioinformatics](#) 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 Tandon 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 Tandon School of Engineering.

---

# 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 6053 Transportation Economics and Finance Fundamentals](#) 3 Credits <sup>1</sup>
- [TR-GY 6333 Transportation and Traffic Concepts, Characteristics, and Studies](#) 3 Credits
- [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 Tandon School of Engineering.

### Note:

---

<sup>1</sup> Effective Spring 2019. Students entering the Advanced Certificate program prior to Spring 2019 may take [TR-GY 6011 Fundamental Concepts in Transportation](#) 1.5 Credits and [TR-GY 6211 Economic Analysis of Transportation Alternatives](#) 1.5 Credits in place of TR-GY 6053.

# 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 6053 Transportation Economics and Finance Fundamentals](#) 3 Credits <sup>1</sup>
  - [TR-GY 6223 Intelligent Transportation Systems and Their Applications](#) 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 7133 Urban Public Transportation Systems](#) 3 Credits

### Grade Requirements

---

Students must maintain a B (3.0) cumulative average in all graduate courses taken at NYU Tandon School of Engineering.

### Note:

---

<sup>1</sup> Effective Spring 2019, Students entering the Advanced Certificate program prior to Spring 2019 may take [TR-GY 6011 Fundamental Concepts in Transportation](#) 1.5 Credits and [TR-GY 6211 Economic Analysis of Transportation Alternatives](#) 1.5 Credits in place of TR-GY 6053.

# 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 Tandon School of Engineering.

---

# Master of Science

# Applied Physics, M.S.

---

## Master of Science in Applied Physics

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, undergraduate GPA, 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 core courses (a 3-credit course in quantum mechanics and two semesters of graduate seminar) with the balance of the necessary credits earned in elective courses. The elective courses may include a 6-credit research project or a 9-credit thesis in applied physics. Up to 9 credits of Tandon engineering, science or computer science courses may also be used as electives in the program. 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 transfer credits of physics courses taken outside NYU, or up to 3 suitable courses from the Graduate School of Arts and Sciences 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 Core 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 the elective courses, up to 4 will be allowed at the 5000 level. Suitable applied physics elective courses include:

- [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 996X MS Project in Applied Physics 1-9 Credits
- PH-GY 997X MS Thesis in Applied Physics 3 Credits

**Total Credits Required: 30**

---

---



# Bioinformatics (Online), M.S.

---

## Bioinformatics

---

The last decade has seen unprecedented changes in biotech, biomedicine, biomanufacturing, and bioengineering. Most of it is fueled by new genomics and other omics technologies that generate massive amount of data, but also do so at a higher and higher resolution going down to single molecules and single cells. The resulting data need to be interpreted carefully, because a single mutation in a base (e.g., “SNP”) could be the cause of a disease. The resulting data is massive, as biotech’s Moore’s law grows exponentially (doubling every five months in comparison to computers’ doubling every eighteen months).

We at Tandon are educating and nurturing tomorrow’s biotech rock-stars, who can address infectious diseases (e.g., Zika or Ebola), genetic diseases (e.g., Cancer, Alzheimer or Autism), public health (Personalized Health Care Program, Diabetes or Obesity), agriculture (e.g., GMO, Genetically Modified Organisms) and green technology (e.g., Energy or GHG(Green House Gas)-sequestration).

This NY State approved program meets industry’s demand for professionals with solid foundations in genomics, proteomics, and transcriptomics; Algorithms, statistics and biotechnology; programming (Python, Perl and R); data science, AI and ML; sequence and pathway analysis, as well as a host of genome informatics tools and algorithms such as BLAST, BioPython, BioPerl, Bioconductor, and UCSC genome browser.

Tandon also provides a bridge program to prepare students with insufficient background in core computer science before admission.

Students who earn a Bioinformatics Advanced Certificate may apply those credits towards the Bioinformatics Master’s Degree. Note that only 9 credits from the Advanced Certificate can be used towards the Bioinformatics Master Degree program.

### Required Core Courses (18 Credits)

---

- [BI-GY 7453 Algorithms and Data Structures for Bioinformatics](#) 3 Credits
- [BI-GY 7663 Problem Solving For Bioinformatics](#) 3 Credits
- [BI-GY 7673 Applied Biostatistics for Bioinformatics](#) 3 Credits
- [BI-GY 7683 Biology and Biotechnology for Bioinformatics](#) 3 Credits
- [BI-GY 7723 Statistics and Mathematics for Bioinformatics](#) 3 Credits
- [BI-GY 7743 Machine Learning and Data Science for Bioinformatics](#) 3 Credits

### Choose a Concentration (6 Credits)

---

#### Laboratory Science Concentration (Required Courses):

---

- BI-GY 7543 Proteomics 3 Credits
- BI-GY 7653 Next Generation Sequence Analysis 3 Credits

### **Translational Science Concentration (Required Courses):**

---

- BI-GY 7693 Population Genetics and Evolutionary Biology 3 Credits
- BI-GY 7733 Translational Genomics and Computational Biology 3 Credits

### **Electives**

---

- BI-GY 7573 Special Topics in Informatics in Chemical and Biological Sciences 3 Credits
- BI-GY 7633 Transcriptomics 3 Credits

### **Minimum Total: 30 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 research with submission of a master's thesis. The second option specifies course requirements plus research performed as guided studies. Students who choose the master's thesis option must register for 6 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 training in laboratory 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.

#### 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
- BE-GY 6503 Bioinstrumentation 3 Credits
- BE-GY 6403 Digital Signal Processing I 3 Credits  
Or ECE-GY 6113 Digital Signal Processing I 3 Credits
- BE-GY 6453 Probability and Stochastic Processes 3 Credits  
Or ECE-GY 6303 Probability and Stochastic Processes 3 Credits
- CBE-GY 6153 Applied Mathematics in Engineering 3 Credits
- BE-GY 9730 Colloquium in Biomedical Engineering 0 Credits
- BE-GY 9740 Seminar in Biomedical Engineering 0 Credits

#### Electives

---

- You may choose up to 9 credits from the list of electives below, subject to the Research option chosen.

## Research Options

---

- [BE-GY 871x Guided Studies in Biomedical Engineering](#) 3-6 Credits, each 3 Credits
- [BE-GY 997x MS Thesis in Biomedical Engineering](#) 6-9 Credits, 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, remaining credits (up to 9 credits) 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.

### Electives

---

The list below contains the elective courses that are available to students pursuing an MS degree in the Bioinstrumentation track.

- [BE-GY 6203 Medical Imaging I](#) 3 Credits  
Or [ECE-GY 6813 Medical Imaging](#) 3 Credits
- [BE-GY 6353 Special Topics in Biomedical Engineering](#) 3 Credits
- [BE-GY 6463 Biostatistics for Biomedical Engineers](#) 3 Credits
- [BE-GY 6603 Drug Delivery](#) 3 Credits
- [BE-GY 6753 Biomechanics and Biomaterials in Orthopaedics](#) 3 Credits
- [BE-GY 6803 Biomaterials: Engineering Principles and Design Considerations](#) 3 Credits
- [BE-GY 871x Guided Studies in Biomedical Engineering](#) 3-6 Credits, each 3 Credits
- [BE-GY 9443 Tissue Engineering](#) 3 Credits
- [BE-GY 9753 Bioethics Seminar](#) 3 Credits
- [BT-GY 6063 Molecular Immunology](#) 3 Credits
- [CM-GY 9433 Protein Engineering](#) 3 Credits
- [CS-GY 6643 Computer Vision and Scene Analysis](#) 3 Credits
- [ECE-GY 6123 Image and Video Processing](#) 3 Credits
- [ECE-GY 6143 Machine Learning](#) 3 Credits
- [ECE-GY 6183 Digital Signal Processing Laboratory](#) 3 Credits
- [ECE-GY 6483 Real Time Embedded Systems](#) 3 Credits
- MATH-GA 2852.001 Advanced Topics in Math Biology 4 Credits
- [ME-GY 7863 Special Topics in Mechanical Engineering](#) 3 Credits
- [PH-GY 6403 Physical Concepts of Polymer Nanocomposites](#) 3 Credits
- [BMSC-GA 4404 Fundamental concepts of MRI](#) 3 Credits
- [BMSC-GA 4409 Advanced MRI](#) 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 research with submission of a master's thesis. The second option specifies course requirements plus research performed as guided studies. Students who choose the master's thesis option must register for 6 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 training in laboratory 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

---

- [BE-GY 6103 Anatomy, Physiology and Biophysics I](#) 3 Credits
- [BE-GY 6113 Anatomy, Physiology and Biophysics II](#) 3 Credits
- [BE-GY 6463 Biostatistics for Biomedical Engineers](#) 3 Credits
- [BE-GY 6753 Biomechanics and Biomaterials in Orthopaedics](#) 3 Credits
- [BE-GY 6803 Biomaterials: Engineering Principles and Design Considerations](#) 3 Credits
- [BE-GY 9443 Tissue Engineering](#) 3 Credits
- [BE-GY 9730 Colloquium in Biomedical Engineering](#) 0 Credits
- [BE-GY 9740 Seminar in Biomedical Engineering](#) 0 Credits
- [BT-GY 6063 Molecular Immunology](#) 3 Credits
- [CM-GY 9433 Protein Engineering](#) 3 Credits

#### Electives

---

- You may choose up to 6 credits from the list of electives below, subject to the Research option chosen.

#### Research Options

---

- [BE-GY 871x Guided Studies in Biomedical Engineering](#) 3-6 Credits, each 3 Credits
- [BE-GY 997x MS Thesis in Biomedical Engineering](#) 6-9 Credits, 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 (up to 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.

## Electives

---

The list below contains the elective courses that are available to students pursuing an MS degree in the Biomaterials track.

- [BE-GY 6203 Medical Imaging I](#) 3 Credits  
or [ECE-GY 6813 Medical Imaging](#) 3 Credits
- [BE-GY 6303 Bio-optics](#) 3 Credits
- [BE-GY 6353 Special Topics in Biomedical Engineering](#) 3 Credits
- [BE-GY 6403 Digital Signal Processing I](#) 3 Credits  
or [ECE-GY 6113 Digital Signal Processing I](#) 3 Credits
- [BE-GY 6453 Probability and Stochastic Processes](#) 3 Credits  
or [ECE-GY 6303 Probability and Stochastic Processes](#) 3 Credits
- [BE-GY 6503 Bioinstrumentation](#) 3 Credits
- [BE-GY 6603 Drug Delivery](#) 3 Credits
- [BE-GY 871x Guided Studies in Biomedical Engineering](#) 3-6 Credits, each 3 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
- [ECE-GY 6123 Image and Video Processing](#) 3 Credits
- [ECE-GY 6143 Machine Learning](#) 3 Credits
- [ECE-GY 6183 Digital Signal Processing Laboratory](#) 3 Credits
- [ECE-GY 6483 Real Time Embedded Systems](#) 3 Credits
- [MA-GA 2852.001 Advanced Topics in Math Biology](#) 4 Credits
- [ME-GY 7863 Special Topics in Mechanical Engineering](#) 3 Credits
- [PH-GY 6403 Physical Concepts of Polymer Nanocomposites](#) 3 Credits
- [BMSC-GA 4404 Fundamental concepts of MRI](#) 3 Credits
- [BMSC-GA 4409 Advanced MRI](#) 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 research with submission of a master's thesis. The second option specifies course requirements plus research performed as guided studies. Students who choose the master's thesis option must register for 6 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 training in laboratory 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
- [BE-GY 6403 Digital Signal Processing I](#) 3 Credits OR [ECE-GY 6113 Digital Signal Processing I](#) 3 Credits
- [BE-GY 6203 Medical Imaging I](#) 3 Credits OR [ECE-GY 6813 Medical Imaging](#) 3 Credits
- [BE-GY 6453 Probability and Stochastic Processes](#) 3 Credits
- [ECE-GY 6303 Probability and Stochastic Processes](#) 3 Credits
- [ECE-GY 6123 Image and Video Processing](#) 3 Credits
- [CBE-GY 6153 Applied Mathematics in Engineering](#) 3 Credits
- [BE-GY 9730 Colloquium in Biomedical Engineering](#) 0 Credits
- [BE-GY 9740 Seminar in Biomedical Engineering](#) 0 Credits

#### Electives

---

- You may choose up to 9 credits from the list of electives below, subject to the Research option chosen.

#### Research Options

---

- [BE-GY 871x Guided Studies in Biomedical Engineering](#) 3-6 Credits, each 3 Credits
- [BE-GY 997x MS Thesis in Biomedical Engineering](#) 6-9 Credits, 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, remaining credits (up to 9 credits) 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.

### Electives

---

The list below contains the elective courses that are available to students pursuing an MS degree in the Medical Imaging track.

- [BE-GY 6303 Bio-optics](#) 3 Credits
- [BE-GY 6353 Special Topics in Biomedical Engineering](#) 3 Credits
- [BE-GY 6463 Biostatistics for Biomedical Engineers](#) 3 Credits
- [BE-GY 6503 Bioinstrumentation](#) 3 Credits
- [BE-GY 6603 Drug Delivery](#) 3 Credits
- [BE-GY 6753 Biomechanics and Biomaterials in Orthopaedics](#) 3 Credits
- [BE-GY 6803 Biomaterials: Engineering Principles and Design Considerations](#) 3 Credits
- [BE-GY 871x Guided Studies in Biomedical Engineering](#) 3-6 Credits, each 3 Credits
- [BE-GY 9443 Tissue Engineering](#) 3 Credits
- [BE-GY 9753 Bioethics Seminar](#) 3 Credits
- [BT-GY 6063 Molecular Immunology](#) 3 Credits
- [CM-GY 9433 Protein Engineering](#) 3 Credits
- [CS-GY 6643 Computer Vision and Scene Analysis](#) 3 Credits
- [ECE-GY 6143 Machine Learning](#) 3 Credits
- [ECE-GY 6183 Digital Signal Processing Laboratory](#) 3 Credits
- [ECE-GY 6483 Real Time Embedded Systems](#) 3 Credits
- [MA-GA 2852.001 Advanced Topics in Math Biology](#) 4 Credits
- [ME-GY 7863 Special Topics in Mechanical Engineering](#) 3 Credits
- [PH-GY 6403 Physical Concepts of Polymer Nanocomposites](#) 3 Credits
- [BMSC-GA 4404 Fundamental concepts of MRI](#) 3 Credits
- [BMSC-GA 4409 Advanced MRI](#) 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. Students also must take at least 15, but no more than 20, credits of Biotechnology or related courses, including 4 required courses, listed below.

### 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 7043 Computer-Aided Protein and Drug Design](#) 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 1.5 Credits](#)
- 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 950x Project in Biotechnology and Entrepreneurship .5-3 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 6043 Biocatalysis in Industry](#) 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
- [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 7043 Computer-Aided Protein and Drug Design 3 Credits
- BT-GY 9053 Enzyme Catalysis in Organic Synthesis 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 1.5 Credits

**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 871X Guided Studies in Biotechnology 0.5-3 Credits
- 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 adviser'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 Urban Infrastructure Systems Management 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 Infrastructure Asset Management 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

- [ECE-GY 6473 Introduction to VLSI System Design](#) 3 Credits
- [ECE-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 ECE 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 ([ECE-GY 9953](#) or [CS-GY 9963](#)) is required.

## MS Thesis Option (6 Credits)

---

A thesis in ECE/CSE ([ECE-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. The Graduate Record Exam (GRE) is required for all applicants.

### 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:

- [ECE-GY 6473 Introduction to VLSI System Design](#) 3 Credits
- [ECE-GY 6463 Advanced Hardware Design](#) 3 Credits
- [ECE-GY 6513 Fundamentals of Solid-State Electronic Devices](#) 3 Credits
- [ECE-GY 6523 Nanoelectronic Devices](#) 3 Credits
- [ECE-GY 6913 Computing Systems Architecture](#) 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 (ECE-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 (ECE-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](#) 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](#) 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

## Preparatory Course

---

The Bridge to NYU Tandon Program is a prerequisite course recommended to those interested in applying for the Computer Science Master's Degree who are lacking a background in computer science, mathematics, science, or engineering.

If you have a degree in liberal arts or similar, our one-course online program will provide you the tools needed to upgrade your computer science knowledge for consideration to a qualifying master's degree at the School of Engineering. Should you complete this intensive bridge course with a grade of B+ or better, you are eligible to be admitted without any course deficiencies, should you meet all other School of Engineering admission requirements.

**Learn more:** [Computer Science Bridge Program](#)

---

# Construction Management, M.S.

---

## Curriculum

---

A minimum of 15 credits (5 courses) must be selected from the following courses:

- CE-GY 7963 Selected Topics in Construction I 3 Credits
- CE-GY 7973 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 3 Credits
- 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.

## Cyber Ops Specialization

---

### National Centers of Academic Excellence in Cyber Operations Program:

NYU Tandon School of Engineering is one of about 20 graduate schools in the country to have the designation of National Centers of Academic Excellence (CAE) in Cyber Operations. The CAE-Cyber Operations program is intended to be a deeply technical, interdisciplinary, higher education program firmly grounded in the computer science (CS), computer engineering (CE), and/or electrical engineering (EE) disciplines, with extensive opportunities for hands-on applications via labs/exercises.

### [National Centers of Academic Excellence - Cyber Operations](#)

#### Courses:

Students who wish to receive an acknowledgment that they have completed the NSA Cyber Operation Program must successfully complete the following courses:

*3 Credits* **Design and Analysis of Algorithms I** CS-GY6033

*3 Credits* **Introduction to Operating Systems** CS-GY6233

*3 Credits* **Penetration Testing and Vulnerability Analysis** CS-GY6573

3 Credits **Information Systems Security Engineering and Management** CS-GY6803

3 Credits **Information, Security and Privacy** CS-GY6813

3 Credits **Network Security** CS-GY6823

3 Credits **Computer Networking** CS-GY6843

3 Credits **Applied Cryptography** CS-GY6903

3 Credits **Application Security** CS-GY9163

The CAE in Cyber Operations Summer Program (CAE-Cyber Ops SP) is the National Security Agency's (NSA) premier outreach program for students enrolled in the Cyber Operations specialization at NSA-designated universities. Selectees will be invited to participate in a 12-week summer program to gain knowledge of specific cyber-related topics and apply educational knowledge to address various real-world mission-related technical challenges. Participants in the program will work on a broad range of problems involving applications of computer science and engineering.

[CAE in Cyber Operations Summer Intern Program](#)

## Preparatory Course

---

### **Bridge to NYU Tandon:**

The Bridge to NYU Tandon Program is a prerequisite course recommended to those interested in applying for the Cybersecurity Master's Degree who are lacking a background in science or engineering.

If you have a degree in liberal arts or similar, our one-course online program will provide you the tools needed to upgrade your math, science or engineering knowledge for consideration to a qualifying master's degree at the School of Engineering. Should you complete this intensive bridge course with a grade of B+ or better, you are eligible to be admitted without any course deficiencies, should you meet all other School of Engineering admission requirements.

Learn More: [Cybersecurity Bridge Program](#)

---

# 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:

- [ECE-GY 6113 Digital Signal Processing I](#) 3 Credits
- [ECE-GY 6253 Linear Systems](#) 3 Credits
- [ECE-GY 6303 Probability and Stochastic Processes](#) 3 Credits
- [ECE-GY 6403 Fundamentals of Analog Integrated Circuit Design](#) 3 Credits
- [ECE-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 centration. 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 ([ECE-GY 997x](#), minimal 6 credits), an advanced project ([ECE-GY 9953](#) or [ECE-GY 9963](#), 3 credits each, [ECE-GY 9941](#), 1.5 credits) or a reading course ([ECE-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 7523 Air Pollution 3 Credits
- CE-GY 7573 Detection and Control of Waterborne Pathogens 3 Credits
- CE-GY 8283 Risk Analysis 3 Credits
- CE-GY 7723 Selected Topics in Environmental and Water Resources Eng I 3 Credits - Geomatics & GIS In Civil and Env Eng.
- CE-GY 7353 Selected Topics in Water Resources and Hydraulic Engineering I 3 Credits - Design of Wetlands

### **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 7523 Air Pollution 3 Credits
- CE-GY 7553 Environmental Toxicology 3 Credits
- CE-GY 7573 Detection and Control of Waterborne Pathogens 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 9963 MS Project in Civil & Urban Engineering 3 Credits

- CE-GY 997X MS Thesis in Civil & Urban Engineering Department 6 Credits
- CE-GY 7353 Selected Topics in Water Resources and Hydraulic Engineering I 3 Credits - Design of Wetlands
- CE-GY 7723 Selected Topics in Environmental and Water Resources Eng I 3 Credits - Geomatics & GIS In Civil and Env Eng.
- 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.

## 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 6023 Financial Economics 3 Credits
- FRE-GY 6073 Introduction to Derivative Securities 3 Credits
- FRE-GY 6083 Quantitative Methods in Finance 3 Credits
- FRE-GY 6103 Valuation for Financial Engineering 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](#) 1.5 Credits

## 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 6023 Financial Economics](#) 3 Credits
- [FRE-GY 6073 Introduction to Derivative Securities](#) 3 Credits
- [FRE-GY 6083 Quantitative Methods in Finance](#) 3 Credits
- [FRE-GY 6103 Valuation for Financial Engineering](#) 3 Credits
- [FRE-GY 6123 Financial Risk Management and Asset Pricing](#) 3 Credits

#### Track-Required Course

---

- [FRE-GY 6273 Advanced Valuation Theory](#) 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
- 6 credits of elective coursework
- 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 Engineering, Financial Markets and Corporate Finance Track, M.S.](#)
- [Financial Engineering, Computational Finance Track, M.S.](#)
- [Financial Engineering, Technology and Algorithmic Finance Track, M.S.](#)
- [Financial Engineering, Risk Track, M.S.](#)

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:

308

- Linear Algebra
- Probability Theory
- Multi-variable Calculus
- Applied Statistics
- Computer Programming

Applicants must submit official transcripts from each institution attended as well as GRE test scores. When applicable, applicants must also prove English language proficiency demonstrated by a TOEFL or IELTS score.

The FRE department does not accept change-of- major requests from students in other NYU programs. In all instances, students must formally apply to this MS FE 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](mailto: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. 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. Risk management embedded in financial risk management of banks and other industrial and financial institutions.
4. Financial regulation to better comprehend the complexity of compliance with regulatory agencies.
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. Gaining a greater appreciation of out-of- equilibrium (incomplete) finance, statistical tools, big data finance, and financial technology to track, assess and control risks are essential in such environments.
6. Market Risk Analytics and Operational Risk Management in banks, investment management firms and hedge funds.
7. 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 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 many 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**

310

## Core Courses (15 Credits)

---

- [FRE-GY 6023 Financial Economics](#) 3 Credits
- [FRE-GY 6073 Introduction to Derivative Securities](#) 3 Credits
- [FRE-GY 6083 Quantitative Methods in Finance](#) 3 Credits
- [FRE-GY 6103 Valuation for Financial Engineering](#) 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 Market Risk Management and Regulation](#) 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](#) 1.5 Credits

## 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 learned bridge computer science and finance to prepare graduates to participate in large-scale and mission-critical projects. Applications include high frequency finance, behavioral finance, agent-based modeling, algorithmic trading, and portfolio management.

Our alumni have developed software projects ranging from behavioral models to bespoke derivative valuations to financial trading, information management and tools and financial platforms. Our students are 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 6023 Financial Economics](#) 3 Credits
- [FRE-GY 6073 Introduction to Derivative Securities](#) 3 Credits
- [FRE-GY 6083 Quantitative Methods in Finance](#) 3 Credits
- [FRE-GY 6103 Valuation for Financial Engineering](#) 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 requirements for the degree Master of Science are stated in this catalog under “[Graduate Degrees](#)”. 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 6103 Management Science](#) 3 Credits
- [MG-GY 6303 Operations Management](#) 3 Credits
- [MG-GY 8203 Project Management](#) 3 Credits
- [MG-GY 6343 Human Capital Engineering & Analytics](#) 3 Credits

- MG-GY 6361 Managing Business Process Reengineering 1.5 Credits
- MG-GY 8643 New Product Development 3 Credits
- MG-GY 8653 Managing Technological Change and Innovation 3 Credits
- MG-GY 9753 Business Analytics 3 Credits
- MG-GY 9753 Quality Management/Six Sigma 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 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 Tandon 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.

### Business and Technology Required Core Courses (12 Credits)

---

- [MG-GY 6013 Organizational Behavior](#) 3 Credits
- [MG-GY 6083 Economics](#) 3 Credits
- [MG-GY 6093 Accounting and Finance](#) 3 Credits
- [MG-GY 7953 Global Innovation](#) 3 Credits

### Technology Management Tools (9 Credits Required)

---

Must take **any three** from the following menu:

- [MG-GY 6933 Information Technologies, Systems and Management in Organizations](#) 3 Credits
- [MG-GY 6303 Operations Management](#) 3 Credits
- [MG-GY 8203 Project Management](#) 3 Credits
- [MG-GY 9753 Selected Topics in Management](#) 3 Credits (*Business Analytics*)
- [MG-GY 9753 Selected Topics in Management](#) 3 Credits (*Communications for Tech Managers*)

### Electives (12 Credits)

---

Can take both 1.5 credits and 3 credits courses totaling up to 12 credits (including internships).

### Capstone Experience (3 Credits Required)

---

Must take **one** of the following:

- [MG-GY 9503 MOT 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



**Total Credits Required: 36**

---

---

# 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 Tandon 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.

## 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: <https://engineering.nyu.edu/academics/programs/management-technology-ms>

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 (12 credits)
- Technology Management Tools (9 credits)

- Elective courses (12 credits)
- Capstone (3 credits)

## Required Courses (36 Credits)

---

### Management Core (12 Credits)

---

- MG-GY 6013 Organizational Behavior 3 Credits
- MG-GY 6083 Economics 3 Credits
- MG-GY 6093 Accounting and Finance 3 Credits
- MG-GY 7953 Global Innovation 3 Credits

### Technology Management Tools (9 Credits)

---

Select 3 of the following courses:

- MG-GY 6303 Operations Management 3 Credits
  - MG-GY 8203 Project Management 3 Credits
  - MG-GY 6933 Information Technologies, Systems and Management in Organizations 3 Credits
- or
- MG-GY 6503 Management of Information Technology and Information Systems 3 Credits (equivalent courses)
  - MG-GY 9753 Selected Topics in Management 3 Credits (*Business Analytics*)
  - MG-GY 9753 Selected Topics in Management 3 Credits (*Communications for Tech Managers*)

## Elective Courses (12 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:

Please visit the Department webpage for the most recent elective offerings:

<https://engineering.nyu.edu/academics/programs/management-technology-ms>

## Capstone Experience (3 Credits)

---

- MG-GY 9503 MOT Capstone Project Course 3 Credits
- or
- MG-GY 9703 Project in Strategy and Innovation 3 Credits
- or
- MG-GY 9753 Selected Topics in Management 3 Credits (*Independent Study*)
- or
- MG-GY 997X MS Thesis in Technology Management 3 Credits
-

## 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 subspecialities 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 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 two graduate courses come from the list of courses under this heading. See courses below.

## Required Courses

---

3 courses from

- [ME-GY 5913 Mechatronics](#) 3 Credits
- [ME-GY 5653 Microelectromechanical 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 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

## **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, Fluid Dynamics and Thermal Systems, 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 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.

### Degree Requirements:

---

- 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 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 ME-GY 997X MS Thesis in Mechanical Engineering (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.

## Fluid Dynamics And Thermal Systems Specialty

---

In the Fluid Dynamics and Thermal Systems area, at least two graduate courses come from the list of courses under this heading. See courses below.

- [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*
- [ME-GY 7063 Convective Heat Transfer](#) *3 Credits*
- [ME-GY 7073 Conductive Heat Transfer](#) *3 Credits*
- [ME-GY 7083 Radiative Heat Transfer](#) *3 Credits*
- [ME-GY 7113 Viscous Flow and Boundary Layers](#) *3 Credits*
- [ME-GY 7133 Compressible Flow](#) *3 Credits*
- [ME-GY 7153 Computational Fluid Mechanics and Heat Transfer](#) *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 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 two 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 3 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 1.5 Credits](#)
- [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 3 Credits

### Microrobotics

---

- ME-GY 7953 Introduction to Smart Materials and Structures 3 Credits
  - ME-GY 7963 Design and Simulation of Microelectromechanical Systems 3 Credits
-



## Translational Surface Engineering, M.S.

---

The MS program in Translational Surface Engineering is unique within the US academia, with the overarching objectives of identifying, inspiring and nurturing the next generation of surface engineers. The curriculum has been developed with the advice of numerous companies, and offers a laboratory course, providing the students with hand-on experience. The program has an educational focus of the fundamental and important aspects of the materials' surface interactions. It focuses on traditional surface science - solid surfaces, as well as on surfactant systems of air/water, water/oil, and water/solid interfaces. The program's goal is to provide the student with the tools to engineer surface and interface properties.

"Translational engineering" is identified as a critical step in translating research into practice, which is motivated by the need to bridge the ever widening gap between exploding scientific advances and their slow adoption by industry. The translational flavor of the program is emphasized throughout the program, in the thesis, as well as in the major project option. In both options the student will gain knowledge about timely, efficient innovative strategies for producing novel groundbreaking technologies and devices.

This MS program provides the student with strong scientific foundation and advanced engineering knowledge, all with an emphasis on engineered interfaces. One can anticipate that graduates of the program will be sought after by industry and academia because of the creative material interaction problem solving abilities students will develop.

The program has two options:

1. **Thesis option** in which the student carries out research which is summarized in a thesis.
2. **Major project option** in which the student takes an aspect of surface engineering, in an area that has been previously researched, and proposes an industrial application using the knowledge acquired in the program.

### **Admission:**

- Minimum GPA 3.5,<sup>1</sup> GRE score of 159+ in Math, and 153+ in English
- BS degree in Chemical Engineering, Mechanical Engineering, Physics, Physical Chemistry, Bioengineering

### **Prerequisite:**

12+ credits of math, two semesters of organic chemistry, two semesters of physical chemistry.

---

<sup>1</sup>Considerations will be made based on applicant's graduation year, and his/her industrial experience.

## 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: 15 Credits

---

The following courses are required of all students:

- [TR-GY 6053 Transportation Economics and Finance Fundamentals](#) 3 Credits <sup>1</sup>
- [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: 15 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*

**Note:**

---

<sup>1</sup> Effective Spring 2019. Students entering the MS program prior to Spring 2019 may take TR-GY 6011 Fundamental Concepts in Transportation *1.5 Credits* and TR-GY 6211 Economic Analysis of Transportation Alternatives *1.5 Credits* in place of TR-GY 6053.

---

# 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 6053 Transportation Economics and Finance Fundamentals 3 Credits
- TR-GY 6113 Forecasting Urban Travel Demand 3 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 3 Credits
- 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 3 Credits
  - 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
-

## 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 courses <sup>1</sup>:

- [CE-GY 7813 Infrastructure Planning, Engineering and Economics](#) 3 Credits
- [CE-GY 7843 Urban Infrastructure Systems Management](#) 3 Credits
- [CE-GY 7853 Infrastructure Asset Management](#) 3 Credits
- [CE-GY 7673 Environmental Impact Assessment](#) 3 Credits
- [CE-GY 8733 Infrastructure Financing: Structuring of a Deal](#) 3 Credits <sup>2</sup>

#### Note:

---

<sup>1</sup> Core courses can be substituted by other selected courses upon approval of the academic advisor.

<sup>2</sup> 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 <sup>2</sup>
- CE-GY 8723 How to Succeed in Construction 3 Credits <sup>2</sup>

**Note:**

---

<sup>2</sup> 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 Credits <sup>2</sup>
- CE-GY 8703 Managing and Leading in the 21st Century 3 Credits <sup>2</sup>

**Note:**

---

Additional electives may be approved by the adviser.

<sup>2</sup> 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

## 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

347

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

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 Infrastructure Systems (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:
  - a. 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).
  - b. 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.

## 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 reimplementations 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.

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

### Systems & Applications

---

- [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 6513 Big Data](#) 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 6943 Artificial Intelligence for Games](#) 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

### 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

## Note

---

Students who began the program before Fall 2015 have the option of completing the requirements that were in effect at the time they began the program.

Students who began the program before Fall 2017 may count CS-GY 6903 Applied Cryptography as a breadth course in the Theory category, and CS-GY 6063 Software Engineering as a breadth course in the Systems and Applications Category.

---

# 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 ECE-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 ([ECE-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 courses:

- [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

367



- [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-GY 9710 Chemical Colloquium](#) 0 Credits

---

#### **F. Chemical Laboratory Safety: 0 Credits**

- 
- [CM-GY 5040 Chemical Laboratory Safety](#) 0 Credits

---

#### **G. Thesis Research: 45 Credits (minimum)**

- 
- [CM-GY 998X Research in Materials Chemistry](#) 0-9 Credits
  - [CM-GY 999X PhD Dissertation in Materials Chemistry](#) 36 (minimum) Credits

---

#### **H. The Rest (if any) are Electives**

---

Up to 9 credits (from CM, BE, BT, or CBE listings).

---

#### **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 45 credits of dissertation research. At least 36 credits of research must be taken beyond MS thesis and at the NYU Tandon School of Engineering. A minimum of 30 graduate course credits beyond the bachelor's degree (not including PhD or MS thesis credits) are required in chemistry and related subjects, of which at least 12 must be taken at the NYU Tandon School of Engineering. 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).

Students must be in continuous attendance at the departmental colloquia ([CM-GY 9710](#)).

---

# 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:

|   | <b>Credits</b> |
|---|----------------|
| Transfer from MS degree                   | 30             |
| Approved course work beyond the MS degree | 21 (minimum)   |
| PhD Dissertation ( <u>ME-GY 999X</u> )    | 24 (minimum)   |
| <hr/>                                     |                |
| Minimum total required                    | 75 (minimum)   |

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

369



# 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: <https://engineering.nyu.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

371

---

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 Tandon) 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 Tandon. 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 Tandon 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.

---

## 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 thesis, 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 “Advisor Clearance hold (XAC)” on the student’s record. When students meet with their advisers, the hold is 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.

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 Tandon 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 first year students and special students receive registration information from the Office of Undergraduate Admissions or the Graduate Admissions 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. 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. 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 Records and Registration 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).

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](#)
  - [Counseling and Wellness Services](#)
  - [Services for Students With Disabilities \[Moses Center\]](#)
  - [International Students and Scholars](#)
  - [Programs and Services for the First-Year Students](#)
  - [Residence Life](#)
  - [Student Affairs: Activities, Advocacy, Leadership](#)
- 

### 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 21<sup>st</sup> 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 Tandon 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 Tandon 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 Tandon 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 Tandon 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,

380

lack of motivation and difficulties with family or friends that can interfere with their NYU Tandon 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 (646) 997-3456 or stopping by the center in Rogers Hall.

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 Tandon 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 Tandon 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 a Disability Specialist and submitting supporting documentation. Visit the NYU Moses Center [website](#) for more details.

## **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 Tandon 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 Global Services](#) (OGS) 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 Tandon has direct-exchange agreements, as well as NYU Study Away 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 3.0 GPA. While these are the minimum NYU Tandon 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 Tandon and may be applied to degree requirements subject to school policies and the approval of the student's major department. For additional information contact the [Office of Undergraduate Academics](#).

## **Programs and Services for the First-Year Students**

### **First-Year 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 Advisement 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**

(See Section on "New Student Orientation" under [Student Affairs: Activities, Advocacy, Leadership](#).)

### **First-Year Dialogue Program**

(See Section on "New Student Programs" under [Student Affairs: Activities, Advocacy, Leadership](#).)

## **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 (212) 998-4600.

### **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 Tandon 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**

The Office of Student Affairs supports the School of Engineering's academic mission by enhancing students' education through a range of programs that build intrapersonal, professional, emotional, and other essential life skills. We work in partnership with academic, support, and service departments to tailor our activities to students' needs. Our programs work to address emerging issues, develop student leadership excellence, promote and foster campus community citizenship, foster campus-wide diversity awareness, and provide general student advocacy. Additionally, the Office of Student Affairs partners with external stakeholders from corporations, not-for-profits, startups, and educational institutions to programmatically enhance the professional development of students and to fulfill diversity pipeline objectives.

### **Inclusion, Diversity, Belonging and Equity Initiatives**

The Office of Student Affairs at Tandon is committed to supporting the diversity mission of New York University "to embrace diversity among faculty, staff and students to ensure a wide range of perspectives." NYU Tandon students reflect the diversity of the world and we have a responsibility to provide and sustain a safe and affirming environment. Our office seeks to create spaces that promote social justice through open and considerate dialogue and where differences are embraced, valued and celebrated. To that end, students will find a variety of opportunities to participate in activities, programs and trainings that allow them to live, learn and grow as global citizens that contribute to the development of a better world. Our Student Affairs hallmark events, the Diversity in STEM and Women in STEM Summits, each happen once an academic year and provide a hands-on day-long experience for students to engage with these issues through workshops, panels, and keynote events.



Please find more information about the University's commitment to diversity here: <https://engineering.nyu.edu/campus-and-community/student-life/diversity-initiatives>

## **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.

### **First-Year Dialogue Program**

The first-year dialogue is a summer reading program which was launched in 2011. It was inspired by the educational paradigm that brings innovation, invention, and entrepreneurship to the NYU Tandon School of Engineering and the academic experience. Over the years as Tandon has transformed into a hub for Technology in Service to Society, and launched its premier MakerSpace, the first-year dialogue has aligned with these important School priorities. During the summer, all incoming students read a text chosen to explore a particular theme that showcases alignment with this paradigm and the school's mission.

### **New Student Convocation**

New Student Convocation, occurring during new student orientation, 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.

### **New Student Orientation (NSO)**

Orientation is designed by various offices throughout the School and with the help of 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.

## **Office of Student Activities and Resource Center**

The Office of Student Activities and Resource Center (OSARC) exists to support the academic goals of the NYU Tandon School of Engineering by providing services and programs designed to enhance and maximize students' co-curricular educational opportunities. All programs and services are designed and implemented with the aim of creating a rich educational environment, infused with the core values of community engagement & civic responsibility, diversity & cultural competency, innovation & creative thinking, interpersonal & leadership development, and connection to the global network university.

## **Community Engagement**

- **Student Organizations:** With over 40 student organizations ranging from professional and cultural groups to performing arts and religious and spiritual groups, there is something for everyone. Check out Club Fest at the beginning of each semester where Tandon's clubs and organizations showcase their missions and programs while recruiting new members at the beginning of each semester. Find out more about clubs and organizations on NYU Engage.

- **Mentorship Programs:** Mentors are a specially selected group of students who provide guidance and support to mentees, while promoting and building community at the Tandon School of Engineering. Currently, formal mentorship programs exist for all women-identified and first-year students. Applications are accepted for both mentorship programs in the Fall semester.
- **Events and Programs:** Join us for a wide range of campus-wide programs, including SOExcited You're Back, Empower Hour, Finals Study Break, International Student programming, off-campus trips, and discounted tickets or visit The HUB (LC 223), the central student lounge, to check out upcoming programs. Make sure to check out our annual programs that celebrate the wonderful traditions here at Tandon.
  - Tandon Kickoff - September
  - Diversity in STEM Summit - November
  - MLK Week - February
  - Tandon Spirit Week - February
  - Women in STEM Summit - March
  - Ally Week - April
  - Student Appreciation Day - May

## Leadership Opportunities

- **Student Council:** Tandon's Student Councils are elected by students to serve as their primary representatives, advocates, and liaisons to the NYU community. Student Council members survey the student body, support student clubs and organizations, coordinate major campus events, and collaborate with offices and students across campus. Student Council elections take place each Spring for both Graduate and Undergraduate Councils.
- **Orientation Leaders:** OLs provide incoming students and their families with a personal introduction and connection to NYU Tandon. They highlight school spirit and tradition, academic expectations and campus life, and promote resources available for student success. OLs are selected in the Spring for both Graduate and Undergraduate Orientation and the Fall for Graduate Orientation only.
- **Tandon Leadership Lab:** Tandon Leadership Lab is a six session program tasked to guide students - through hands-on activities and critical dialogue - in discovering who they are as leaders and becoming confident with tangible leadership skills and strategies that can be applied to their everyday lives.

## Service Opportunities

- **The Poly Project:** Tandon's service-learning initiative works to provide regular and sustained opportunities for students to engage in community service. Students are able to volunteer in the local Brooklyn community and serve in leadership roles as Service Ambassadors.
- **SOEciety:** The SOEciety Service Learning Experience provides students with an immersive alternative break volunteer experience that allows them to better understand personal and social identities, while working to serve a community's needs as future leaders in STEM. Through this experience, students will engage with topics of social justice and leadership while working toward becoming social change agents.

## Advocacy & 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, Deanna Rayment, Coordinator of Advocacy, Compliance, and Student Affairs, works with various other offices to help students solve problems and develop self-advocacy skills.

### Excused Absence and Required Notification to Faculty

Students may request special accommodations for class absence in the following cases:

- **Medical reasons**
- **Death in immediate family**

- **Personal qualified emergencies (documentation must be provided)**
- **Religious Expression or Practice**

If illness or an accident causes you to miss a class (or classes) or an exam, you should do the following:

- **Notify Deanna Rayment in the Office of Student Affairs via email ([deanna.rayment@nyu.edu](mailto:deanna.rayment@nyu.edu)) of your absence within two weeks of the absence.** This email should contain appropriate documentation as to why you were absent. All correspondence should contain your N#.

Any medical documentation should include:

- **Diagnosis**
- **Exact dates of absence**
- **Estimated of the length of your absence**
- **Return Date**

***\*\*If medical documentation does not list the above, your request for excused absence will be considered incomplete, which may delay processing the request. \*\****

Do not provide anyone except this office with a copy of your medical documentation; the Office of Student Affairs is the office designated to receive documentation regarding private concerns. If a professor requests a copy, refer them to Student Affairs. This is to protect the confidentiality of your medical information.

**Please Note:** 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.

## **Student Religious Observance**

View NYU's policy regarding observing religious holidays here: <https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/university-calendar-policy-on-religious-holidays.html>

The School of Engineering's policy requires students to provide Deanna Rayment in the Office of Student Affairs with written notification via email ([deanna.rayment@nyu.edu](mailto:deanna.rayment@nyu.edu)) at least 15 days in advance of the days to be taken off, as well as the course names and course numbers of missed classes, name and email contact for your professors. Student Affairs will provide notice to your professors. Students remain responsible for work missed.

## **Conduct Compliance**

Issues involving behavioral misconduct are referred to the Office of Student Conduct, 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

---

- [First-Year Programs](#)
  - [Academic Advisement Center](#)
  - [Office of Academic Affairs](#)
  - [TRIO Scholars Program](#)
  - [Polytechnic Tutoring Center \(PTC\)](#)
- 

### First-Year 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 advisors advocate for students with NYU Tandon School of Engineering offices and help students deal with issues affecting them. Students are assigned advisors in their major departments after the first year.

Students may make an appointment or drop in to see their advisor. 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 advisors 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 advisors 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 advisors 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/trioscholars>.

## **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 [engineering.nyu.edu/academics/support/polytechnic](http://engineering.nyu.edu/academics/support/polytechnic).

---



## Special Programs

---

- [General Studies \(GS\) Program](#)
  - [Opportunity Programs \(OP\)](#)
  - [Honors Program](#)
  - [Center for K-12 Stem Education](#)
-

# 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 \(https://engineering.nyu.edu/academics/support-services/undergraduate-services/general-studies-program\)](https://engineering.nyu.edu/academics/support-services/undergraduate-services/general-studies-program) 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) and the CSS Profile forms. Students are urged to complete these forms as early as possible to get the best financial aid package. For more information about financial aid eligibility and the application process, please visit the [NYU Financial Aid](#) website.

---

## Opportunity Programs (OP)

---

Through the NYU Opportunity Programs, two college programs are available to residents of New York State. The Arthur O. Eve Higher Education Opportunity Program (HEOP) is funded by the New York State Education Department to provide a broad array of academic and financial aid support to capable students who, due to limited educational and economic resources, might otherwise not have the opportunity to attend NYU. Once admitted to NYU through HEOP, students are eligible to receive a full-need financial aid package along with academic support in the form of counseling, tutoring, advisement, and other assistance throughout their undergraduate studies.

The Collegiate Science and Technology Program (CSTEP) is also funded by New York State to provide underrepresented or disadvantaged students access to academic programs that prepare them for careers in science, engineering, or health-related professions. Once admitted to NYU through CSTEP, students receive academic assistance including counseling, tutoring, advisement, and other support services throughout their undergraduate studies.

HEOP and CSTEP's goal at the NYU Tandon School of Engineering are to retain and graduate students who are traditionally underrepresented in science, technology, engineering, and mathematics fields.

For more information about HEOP and CSTEP, please visit the NYU Opportunity Programs page:

<https://www.nyu.edu/admissions/undergraduate-admissions/how-to-apply/all-freshmen-applicants/opportunity-programs.html>

---

# Honors Program

---

- [Admission and Application Procedures](#)
  - [Requirements](#)
- 

The NYU Tandon 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 NYU Tandon as first-year students will be referred to 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.

Students who were not referred to the Honors Program during their initial application to Tandon 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 may 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. 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 nearly 20 years - with funding from the National Science Foundation, and other public, philanthropic and corporate sources - 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.

Our methodology for K-12 STEM education and related research 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, and our STEM education research projects, 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 equity in STEM studies and pursuits, and enhance and reinforce their own learning, creativity and professionalism.

---

## Index of HEGIS Codes

### Degrees Offered at NYU Tandon School of Engineering

NYU Tandon 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 <sup>1</sup> | CIP Code <sup>2</sup> | Brooklyn    | Manhattan | On-Line |
|--|-------------------------|-----------------------|-------------|-----------|---------|
| Applied Physics                                  | 1902.00                 | 14.1201               | BS, MS, PhD |           |         |
| Bioinformatics <sup>3</sup>                      | 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 <sup>3</sup>                | 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 <sup>3</sup>              | 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 <sup>3</sup>              | 0913.00                 | 54.0401               | MS          |           | MS      |

397

|   |         |         |             |    |    |
|---|---------|---------|-------------|----|----|
| Integrated Digital Media                | 0604.00 | 11.0103 | BS, MS      |    |    |
| Management                              | 0506.00 | 15.1501 | MS          |    |    |
| Management of Technology                | 0599.00 | 15.1501 | MS          | 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          |    |    |
| Science and Technology Studies          | 2299.00 | 54.0104 | BS          |    |    |
| Sustainable Urban Environments          | 4903.00 | 30.3301 | 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 Infrastructure Systems            | 0999.00 | 14.0803 | MS          |    |    |

<sup>1</sup> Higher Education General Inventory System

<sup>2</sup> Classification of Instructional Program

<sup>3</sup> Executive format program

## Advanced Certificates Offered at the NYU Tandon School of Engineering

| Program Title                               | HEGIS code <sup>1</sup> | CIP Code <sup>2</sup> | Academic Department          | Campus   |
|---|-------------------------|-----------------------|------------------------------|----------|
| Bioinformatics                              | 1999.20                 | 26.1113               |                              | Online   |
| Construction Management                     | 0599.00                 | 14.3301               | Civil Engineering/Management | Brooklyn |
| Executive Construction Management (Exec 21) | 0599.00                 | 14.3301               | Civil Engineering            | Brooklyn |
| Traffic Engineering                         | 0908.00                 | 14.0804               | Civil and Urban Engineering  | Brooklyn |
| Transportation Management                   | 0908.00                 | 14.0804               | Civil and Urban Engineering  | Brooklyn |
| Transportation Planning                     | 0908.00                 | 14.0804               | Civil and Urban Engineering  | Brooklyn |