INDUSTRIAL ENGINEERING (MS)

Technology Management and Innovation (https://engineering.nyu.edu/academics/departments/technology-management-and-innovation/)

NYSED: 08834 **HEGIS:** 0913.00 **CIP:** 14.3501

Program Description

The NYU Tandon School of Engineering Master's Degree Program in Industrial Engineering (IE) is a top U.S. News and World Report ranked program focused on preparing students to assume organizational leadership roles after they graduate. We provide a strong academic foundation and combine it with an emphasis on application. Our courses are taught by professors with significant industry experience. They teach project-based, highly practical courses focused on helping you to apply the principles you learn in class to the situations you will face in helping organizations to grow and improve.

The top reasons for choosing our program include:

- top ranked program that continues to climb in the ranks
- strong foundational core taught by highly experienced professors
- emphasis on experiential learning culminating in highly regarded Capstone program where students get to apply what they have learned on a company-sponsored project
- high degree of program flexibility, with the ability to choose electives from across our department and the university
- strong networking and career support with student clubs professionally affiliated with INFORMs and IISE, LinkedIn Group (https://www.linkedin.com/groups/12321411/), IE Alumni Advisory board, career development and professional certification workshops
- great location, in the heart of the Brooklyn Tech Triangle (https://engineering.nyu.edu/about/brooklyn/) and a subway ride to Manhattan we are close to many companies across diverse industries which creates outstanding opportunities for internships and job placement

Admissions

To apply for admission to any Tandon graduate program, please contact the Office of Graduate Admissions (https://engineering.nyu.edu/admissions/graduate/).

Program Requirements

Industrial Engineering students come from a wide variety of backgrounds and an engineering degree is not required to join our program. 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.

Program Requirements

The MS in Industrial Engineering requires 30 credits, comprised of the following:

Course	Title	Credits
Core Courses		
Select four of the following:		12
IE-GY 6113	Quality Control and Improvement	
IE-GY 6203	Project Planning and Control (Project Management)	
IE-GY 6213	Facility Planning and Design	
IE-GY 6283	OPERATIONS RESEARCH: STOCHASTIC MODELS	
IE-GY 6823	Factory Simulation	
MN-GY 7893	Production Science	
IE Electives		
Select three of the following:		9
IE-GY 6003		
IE-GY 6063	Work Design and Measurement	
IE-GY 7653		
IE-GY 7873	LEAN MANUFACTURING	
IE-GY 7923		
IE-GY 7993	SUPPLY CHAIN ENGINEERING	
MG-GY 6103	MANAGEMENT SCIENCE	
MG-GY 6303	OPERATIONS MANAGEMENT	
MG-GY 6343	HUMAN CAPITAL ENGINEERING & ANALYTICS	
MG-GY 8643	NEW PRODUCT DEVELOPMENT	
MG-GY 8653		
MG-GY 9753	SELECTED TOPICS IN MANAGEMENT (Business Analytics)	
MG-GY 9753	SELECTED TOPICS IN MANAGEMENT (Quality Management/Six Sigma)	
Free Electives		
Select 6 credits of free electives [1]		6
Capstone		
Select a capstone course in consultation with the academic adviser		3
Total Credits		**30**

[1] These can be additional courses from the lists above, or outside of Industrial Engineering with the approval of the academic adviser. Courses cannot be selected from the School of Professional Studies.

Industrial Engineering Tracks

The Industrial Engineering degree comprises 12 courses totaling 30 credits. Courses for the IE program are held at the Brooklyn campus of NYU Tandon. Industrial engineers determine the most effective ways to design, manage and improve systems —people, machines, materials, information, and energy—to make a product or provide a service. In this regard, the IE program's courses provide participants with a deep understanding of the foundational elements of industrial engineering. Industrial engineers play a key role in driving change. The skills that industrial engineers develop in areas like change management, organizational transformation and systems optimization are becoming increasingly valuable, and highly sought after across a wide range of industries. Industrial engineers work in consulting firms, financial services, health care, government, transportation, construction, social

services, operations, and supply chain management. The electives, both industrial engineering and free are therefore offered to provide the student with the flexibility to create a self-customized curriculum by organizing electives into "tracks." These are suggested specializations and reflect the recent directional advances in the field. However, students may elect a unique focus by creating a curriculum that includes courses across the prescribed tracks.

These tracks are:

- **Business Transformation and Continuous Improvement** - for students interested in helping organizations understand where to focus, then help them build and implement the capability to transform their organization. This is of primary interest to those students considering careers in consulting.
- **Operations and Supply Chain Management** - for students interested in building agile, dynamic teams capable of partnering across the enterprise to continuously define and deliver customer-centric value. This is of primary interest to those students considering careers in management.
- **Operations Research and Systems Analytics** - for students interested in working with organizational leaders and cross-enterprise teams to frame the discussion on how to best use data to drive the conversation on where to focus improvement efforts. This is of primary interest to those students considering data science and operations analysis.

These are suggested tracks only. We work with students to select courses from across our department and the university to create opportunities to align with and provide support for their career ambitions.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
Core Course		3
Core Course		3
Industrial Engineering Elective		3
	Credits	**9**
2nd Semester/Term		
Core Course		3
Core Course		3
Industrial Engineering Elective		3
	Credits	**9**
3rd Semester/Term		
Industrial Engineering Elective		3
Free Elective		3
Free Elective		3
	Credits	**9**
4th Semester/Term		
Capstone Course		3
	Credits	**3**
	Total Credits	**30**

Learning Outcomes

Upon successful completion of the program, graduates will:

1. Understand the general principles underlying the various types of control charts and, why it works, how to interpret results and how to decide which method to use in any particular case
2. Understand the sampling theory and the uses of sampling table and be able to define the right sampling plan for any particular area.
3. Define quality system components (Quality Control and Improvements, and Quality Assurance) and be able to understand their application in manufacturing and systems environments.
4. Create flowcharts for simulations, determine whether or not a difference in responses is significant.
5. Design experiments, set up and analyze the results of a Witness Horizon program, and simulation via spreadsheet.
6. Gain an understanding of the phasing of facility design work and its importance in the engineering and construction field today.
7. Learn how to layout an industrial plant from a practical point of view.
8. Understand the various engineering entities involved in planning and design, and the complexity of their interactions.
9. Understand how to develop a budget estimate for the capital investment required for the design and construction of an industrial facility and how different techniques apply to different design phases.
10. Gain an understanding of the role that the legal component plays in the planning and permitting process.
11. Have an opportunity to actually see an industrial plant on a field trip, review its design aspects and compare those aspects to classroom learning.
12. Understand linear programming as applied to operations optimization.
13. Understand Single Stage Systems and Markov Processes.
14. Understand Queuing Systems and the application to Operations Simulation.
15. Understand the impact of variation on throughput and setup.
16. Be able to define the similarities and differences of push-pull systems.
17. Understand the core dimensions of service effectiveness.

Policies

NYU Policies

University-wide policies can be found on the New York University Policy pages (https://bulletins.nyu.edu/nyu/policies/).

Tandon Policies

Additional academic policies can be found on the Tandon academic policy page (https://bulletins.nyu.edu/graduate/engineering/academic-policies/).