

# Industrial, Manufacturing and Systems Engineering - Graduate Programs

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## M.S. in Industrial Engineering

The Industrial Engineering Program is designed to provide the student with fundamental knowledge in multiple areas of industrial engineering. A student may pursue a broad based degree or they may specialize in a specific area such as general industrial engineering, manufacturing systems, ergonomics/human factors, or advanced analytics/operations research.

## M.S. in Engineering Management

The Master of Science in Engineering Management is a STEM program designed to introduce both engineering and business tools to engineering professionals who will be moving into leadership positions in product development, strategic planning, or managing the organization's technology resources. Graduates develop an understanding of how to use an organization's technical knowledge, skills, and abilities to meet their strategic objectives.

## Ph.D. in Industrial Engineering

The Industrial Engineering Program for doctoral students is designed to prepare engineers to advance their degrees in industry, government, and academia. This is a research focused program with areas of specialization in general industrial engineering, manufacturing systems, ergonomics/human factors, advanced analytics/operations research, or systems engineering/engineering management.

## Graduate Certificates in Industrial Engineering

The Graduate Certificates provide students with the opportunity to be recognized for developing skills in a specialization. The Certificate in Unmanned Vehicle Systems may be earned while enrolled in the M.S. in Industrial Engineering program. The Certificates in Industrial Applications, Decision Analytics, and Logistics may be earned as a stand alone degree or while enrolled in the M.S. in Industrial Engineering program.

## Admission Criteria:

### M.S. in Industrial Engineering

### M.S. in Engineering Management Programs

#### Unconditional Admission

- A GPA of at least 3.0 in the last 60 hours of undergraduate coursework.
- A GPA of at least 3.0 in all prior graduate work.
- A minimum score of 155 on the GRE Quantitative section and 146 on the GRE Verbal section.
- A minimum score of 79 on the TOEFL iBT, or a minimum score of 6.5 on the IELTS, if English is not the applicant's native language. International applicant's who have successfully completed a bachelors degree or masters degree from an institution in the United States, and are not seeking funding as a Graduate Teaching Assistant are not required to meet this requirement.
- A BS or MS in Engineering or Science.

Remedial course work may be required if an applicant does not have an engineering or science background.

#### GRE Waiver

Applicants may request a GRE Waiver if they meet all other admission criteria, they have graduated from an ABET accredited institution, and have a minimal of two years of relevant work experience post-degree. GRE waiver requests may be submitted at <https://common.forms.uta.edu/view.php?id=71616>.

#### Continuation

In order to continue in the program toward graduation, each graduate student must:

- Maintain at least a 3.0 overall GPA in all coursework taken as a graduate student and in their program, and
- Demonstrate suitability for professional practice.

If questions are raised by graduate faculty regarding either of the above, the student will be notified and will be provided the opportunity to respond to the Committee on Graduate Studies in the Department. The Committee on Graduate Studies will review the student's performance and make a recommendation concerning the student's eligibility to continue in the program. Appeal of a decision on continuation may be made through normal procedures outlined in the section of this catalog entitled "Grievances Other than Grades."

## Student Outcomes

In accordance with our educational objectives, we have designed our programs to ensure graduates of our Master's and Doctoral Programs will:

- Have attained mastery of theoretical concepts in the field
- Be able to use techniques and tools important in the field
- Appreciate the need for ethical and professional behavior
- Be able to work and communicate effectively in teams

## M.S. in Industrial Engineering - Degree Plan

**Core Courses (12 credit hours)** - Students should complete the core courses as soon as possible

- IE 5301 Advanced Operations Research
- IE 5304 Advanced Engineering Economy
- IE 5317 Introduction to Statistics
- IE 5318 Applied Linear Regression

**Application Courses (12 credit hours)** - Students must complete 4 additional industrial engineering graduate courses

**Electives (6 credit hours)** - Students must complete 2 additional graduate courses from the College of Engineering, the College of Science, or approved courses from the College of Business. Students may elect to pursue a Capstone under supervision of an Industrial Engineering Department faculty member by substituting a 3-hour elective course with a 3-hour capstone course.

Students may elect to pursue a Thesis option by substituting two 3-hour elective courses with two 3-hour thesis courses, under the supervision of an Industrial Engineering Department faculty member.

## Fast Track Program for a Masters in Industrial Engineering

The Fast Track Program enables outstanding UT Arlington senior undergraduate students in Industrial Engineering to satisfy degree requirements leading to a master's degree in Industrial Engineering while completing their undergraduate studies. When senior-level students are within 15 hours of completing their undergraduate degree requirements, they may take up to 6 hours of approved senior level coursework designated by the Industrial Engineering Program to satisfy both undergraduate and graduate degree requirements. In the limiting case, a student completing the maximum allowable hours (6) while in undergraduate status would have to take only 24 additional masters level hours to meet minimum requirements for graduation.

Interested UT Arlington undergraduate Industrial Engineering students should apply to the Fast Track Program just prior to beginning their last 30 hours of their bachelor's degree. They must have completed at least 30 hours at UTA, achieving an overall GPA of 3.0 or better in all work done at UTA. Additionally, they must have completed 9 hours of specified foundation courses with a minimum GPA of 3.3 in those courses. Contact the Undergraduate Advisor or Graduate Advisor in Industrial Engineering for more information about the program.

## M.S. in Engineering Management - Degree Plan

**Core Courses (6 credit hours)** - Students should complete the core courses as soon as possible

- IE 5304 Advanced Engineering Economy
- IE 5317 Introduction to Statistics

**Application Courses (18 credit hours)** - Students must complete 6 additional industrial engineering and business courses

- IE 6305 Engineering Management I
- IE 6306 Engineering Management II
- IE 5351 Introduction to Systems Engineering
- IE 5346 Technology Development and Deployment
- IE 5321 Enterprise Analysis and Design
- ACCT 5307 Measurement and Analysis for Business Decision Making

**Electives (6 credit hours)** - Students must complete 2 additional graduate courses from the College of Engineering, the College of Science, or approved courses from the College of Business. Students may elect to pursue a Capstone under supervision of an Industrial Engineering Department faculty member by substituting a 3-hour elective course with a 3-hour capstone course.

## Final Comprehensive Examination

A final comprehensive examination is required for each master's candidate. It is taken in the last semester of the student's program of study. Students electing the thesis option will be required to complete a final thesis defense in place of the final comprehensive examination.

## Transfer Credit

A student may transfer a maximum of 6 hours of graduate coursework from engineering, science, or business to the M.S. programs in the Department of Industrial, Manufacturing, & Systems Engineering. The coursework must be appropriate for the degree program. Students electing the thesis option may only transfer industrial engineering courses to their program.

## Doctoral Program Objective

The Industrial, Manufacturing, & Systems Engineering Department Doctoral program is designed for advanced graduate students who wish to advance their careers in research and development in industry, government, or academia.

A student's program will consist of coursework, independent study, and a dissertation in a field pertinent to the student's areas of interest. The program for each student will be planned by the student and a committee of faculty members.

Students with undergraduate degrees in fields other than engineering may be required to take necessary courses to establish a background in science, mathematics, and engineering.

## Admission Criteria for the Doctoral Program

### Unconditional Admission

Unconditional Admission into the Doctoral program in Industrial Engineering is granted if all of the following conditions are met.

- A GPA of at least 3.0 in the last 60 hours of undergraduate coursework.
- A GPA of at least 3.3 in all prior graduate coursework.
- A minimum score of 155 on the GRE Quantitative section and a minimum score of 305 for the GRE Quantitative and Verbal sections combined.
- A minimum score of 79 on the TOEFL iBT, or equivalent, if English is not the applicant's native language.
- A completed MS in Engineering or Science.

Remedial course work may be required if an applicant does not have sufficient engineering or science background.

### Probationary Admission

Prospective students not meeting the conditions for unconditional admission may be granted probationary admission if their qualifications indicate a potential for success. Deficiency coursework may be required. Satisfying all deficiency requirements and maintaining a GPA of at least 3.0 in each of their first two semesters of graduate work may clear probationary status.

### Continuation

In order to continue in the program toward graduation, each graduate student must:

- Maintain at least a 3.0 overall GPA in all coursework taken as a graduate student and in the program, and
- Demonstrate suitability for professional practice.

If questions are raised by graduate faculty regarding either of the above, the student will be notified and will be provided the opportunity to respond to the Committee on Graduate Studies in the Department. The Committee on Graduate Studies will review the student's performance and make a recommendation concerning the student's eligibility to continue in the program. Appeal of a decision on continuation may be made through normal procedures outlined in the section of this catalog entitled "Grievances Other than Grades."

## Bachelor's to Doctoral Program for UTA Graduates

The Bachelor's to Doctoral Program in Industrial Engineering is available to doctoral applicants that are U.S. citizens or permanent residents and have completed a B.S. degree in Engineering at an ABET-accredited program. Unconditional Admission is granted if all of the following conditions are met.

- A GPA of at least 3.0 in the last 60 hours of undergraduate coursework.
- A GPA of at least 3.3 in all prior graduate coursework, if any.
- A minimum score of 155 on the GRE Quantitative section and a minimum score of 305 for the GRE Quantitative and Verbal sections combined.
- A minimum score of 79 on the TOEFL iBT, or equivalent, if English is not the applicant's native language.

Remedial course work may be required if an applicant does not have sufficient engineering or science background.

## Student Outcomes

In accordance with our educational objectives, we have designed our program to ensure graduates of our Doctoral Program will

- Have attained a comprehensive master of the theoretical concepts in the field
- Be able to use and develop techniques and tools in the field
- Appreciate the need for ethical and professional behavior
- Be able to work, communicate, and lead teams effectively

## Admission Criteria:

### Unconditional Admission

- A GPA of at least 3.0 in the last 60 hours of undergraduate coursework.
- A GPA of at least 3.0 in all prior graduate work.
- A minimum score of 155 on the GRE Quantitative section and 146 on the GRE Verbal section.
- A BS or MS in Engineering or Science.

Remedial course work may be required if an applicant does not have an engineering or science background.

### GRE Waiver

Applicants may request a GRE Waiver if they meet all other admission criteria, they have graduated from an ABET accredited institution, and have a minimal of two years of relevant work experience post-degree. GRE waiver requests may be submitted at <https://common.forms.uta.edu/view.php?id=71616>.

### Continuation

In order to continue in the program toward graduation, each graduate student must:

- Maintain at least a 3.0 overall GPA in all coursework taken as a graduate student and in their program, and
- Demonstrate suitability for professional practice.

If questions are raised by graduate faculty regarding either of the above, the student will be notified and will be provided the opportunity to respond to the Committee on Graduate Studies in the Department. The Committee on Graduate Studies will review the student's performance and make a recommendation concerning the student's eligibility to continue in the program. Appeal of a decision on continuation may be made through normal procedures outlined in the section of this catalog entitled "Grievances Other than Grades."

## Student Outcomes

In accordance with our educational objectives, we have designed our programs to ensure graduates of our Master's and Doctoral Programs will:

- Have attained mastery of theoretical concepts in the field
- Be able to use techniques and tools important in the field
- Appreciate the need for ethical and professional behavior
- Be able to work and communicate effectively in teams

## Certificate in Unmanned Vehicle Systems - Degree Plan

### Academic Requirements

Students must complete the following requirements:

- 6 hours of an interdisciplinary core curriculum forming the basis of a common core in UVS Certificate
- 9 hours of discipline specific curriculum.
- Maintain a combined GPA of 3.0 or better in all courses used to satisfy the certificate requirements.

**Core Courses (12 credit hours)** - Students should complete the core courses as soon as possible

- IE 5378 Introduction to Unmanned Vehicle Systems
- IE 5379 Unmanned Vehicle System Development

**Application Courses (9 credit hours)** - Students must complete 3 additional industrial engineering graduate courses

Students must complete 15 hours of coursework and maintain 3.0 grade point average or better in the five program courses. Course requirements are managed by the certificate program advisor

## Certificate in Industrial Applications - Degree Plan

- REQUIRED (1 COURSE)
  - IE 5317 Introduction to Statistics
- ELECTIVES (Select 3 COURSES)
  - IE 5303 Quality Systems
  - IE 5321 Enterprise Analysis and Design
  - IE 5322 Simulation and Optimization
  - IE 5329 Production and Inventory Control
  - IE 5330 Automation and Advanced Manufacturing
  - IE 5338 Human Engineering
  - IE 5342 Metrics and Measurements
  - IE 6302 Facilities Planning and Design
- OPEN ELECTIVE (1 COURSE)
  - Select one elective graduate from engineering or science, or an approved course from the College of Business

## Certificate in Decision Analytics - Degree Plan

- REQUIRED (2 COURSES)
  - IE 5317 Introduction to Statistics
  - IE 5301 Operations Research
- ELECTIVES (Select 2 COURSES)
  - IE 5303 Quality Systems
  - IE 5305 Linear Programming
  - IE 5306 Dynamic Programming
  - IE 5311 Decision Analysis
  - IE 5318 Applied Regression Analysis
  - IE 5322 Simulation and Optimization
  - IE 6308 Design of Experiments
  - IE 6318 Data Mining and Analysis
- OPEN ELECTIVE (1 COURSE)
  - Select one elective graduate courses from engineering or science, or an approved course from the College of Business

## Certificate in Logistics - Degree Plan

- REQUIRED (1 COURSE)
  - IE 5317 Introduction to Statistics
- ELECTIVES (Select 3 COURSES)
  - IE 5310 Production Systems Design
  - IE 5329 Production and Inventory Control Systems
  - IE 5333 Logistics Transportation Systems
  - IE 5334 Logistics Distribution Systems
  - OPMA 5368 Global Supply Chain Management
  - OPMA 5369 Logistics Management
- OPEN ELECTIVE (1 COURSE)
  - Select one elective graduate courses from engineering or science, or an approved course from the College of Business