

# INDUSTRIAL AND SYSTEMS ENGINEERING

## Program Information

The Department of Industrial and Systems Engineering offers the Master of Engineering degree, the Master of Science degree, the Engineer degree, and the Doctor of Philosophy degree. Complete descriptions of the minimum requirements for the M.E., M.S., Engineer, and Ph.D. degrees are provided in the Graduate Degrees (<http://gradcatalog.ufl.edu/graduate/degrees/>) section of this catalog.

### Master of Science (M.S.) Program

Admission to the Master of Science program is open to students with an undergraduate degree in engineering, mathematics, statistics, computer science, physics, quantitative management, or similar field. The M.S. degree does not require a thesis, although a student interested in pursuing research or possibly continuing their education beyond a master's degree is encouraged to write one.

### Master of Engineering (M.E.) Program

Students seeking admission to the Master of Engineering program must have a bachelor's degree from an ABET-accredited curriculum or have taken sufficient articulation course work to meet the minimum requirements specified by ABET. The M.E. degree does not require a thesis and is generally considered a terminal degree.

### Ph.D. Program

The doctoral program in Industrial and Systems Engineering covers the areas of data analytics, health systems engineering, human-systems engineering, operations research (including deterministic and stochastic processes), risk management and financial engineering, and supply chain and logistics systems. Application areas include energy systems, financial engineering, healthcare, manufacturing systems, security systems, supply chain management, and transportation systems.

For more information, please see our website: <http://www.ise.ufl.edu>.

## Degrees Offered

### Degrees Offered with a Major in Industrial and Systems Engineering

- Doctor of Philosophy
  - without a concentration
  - concentration in Quantitative Finance
- Master of Engineering
- Master of Science

Requirements for these degrees are given in the Graduate Degrees (<http://gradcatalog.ufl.edu/graduate/degrees/>) section of this catalog.

## Courses

### Industrial and Systems Engineering Departmental Courses

Code	Title	Credits
EGN 5949	Practicum/Internship/Cooperative Work Experience	1-6
EGN 6640	Entrepreneurship for Engineers	3

EGN 6913	Engineering Graduate Research	0-3
EIN 5249	Human Factors in System Design	3
EIN 5501	Health Systems Engineering Models and Methods	3
EIN 6176	Advanced Quality Management and Engineering for Business Processes	3
EIN 6212	Loss Assessment and Control	3
EIN 6215	System Safety Engineering	3
EIN 6216	Occupational Safety Engineering	3
EIN 6336	Advanced Production and Inventory Control	3
EIN 6357	Advanced Engineering Economy	3
EIN 6422	Manufacturing Management	3
EIN 6510	Principles of Manufacturing Systems Engineering	3
EIN 6905	Special Problems	1-6
EIN 6910	Supervised Research	1-5
EIN 6918	Graduate Seminar	1
EIN 6940	Supervised Teaching	1-5
EIN 6971	Research for Master's Thesis	1-15
EIN 7933	Special Problems	1-6
EIN 7979	Advanced Research	1-12
EIN 7980	Research for Doctoral Dissertation	1-15
ESI 5236	Reliability Engineering	3
ESI 6314	Deterministic Methods in Operations Research	4
ESI 6323	Models for Supply Chain Management	3
ESI 6325	Applied Probability Methods in Engineering	3
ESI 6341	Intro to Stochastic Optimization	3
ESI 6346	Decision Making under Uncertainty	3
ESI 6352	Financial Optimization Case Studies	3
ESI 6355	Decision Support Systems for Industrial and Systems Engineers	4
ESI 6417	Linear Programming and Network Optimization	3
ESI 6418	Linear Programming Extensions and Applications	3
ESI 6420	Fundamentals of Mathematical Programming	3
ESI 6429	Introduction to Nonlinear Optimization	3
ESI 6448	Discrete Optimization Theory	3
ESI 6449	Integer Programming	3
ESI 6492	Global Optimization	3
ESI 6529	Digital Simulation Techniques	3
ESI 6533	Advanced Simulation Design and Analysis	3
ESI 6546	Stochastic Modeling and Analysis	3
ESI 6552	Systems Architecture	3
ESI 6553	Systems Design	3
ESI 6555	Systems Management	3
ESI 6616	Data Analytics for System Monitoring	3
ESI 6617	High-Dimensional Data Analytics	3

## College of Engineering Courses

Code	Title	Credits
EEE 5354L	Semiconductor Device Fabrication Laboratory	3
EGN 5010L	NRF Training Lab	1
EGN 5949	Practicum/Internship/Cooperative Work Experience	1-6
EGN 6640	Entrepreneurship for Engineers	3
EGN 6642	Engineering Innovation	3
EGN 6913	Engineering Graduate Research	0-3
EGN 6933	Special Topics	1-3

EGN 6937	Engineering Fellowship Preparation	0-1
EGS 6039	Engineering Leadership	3
EGS 6101	Divergent Thinking	3
EGS 6626	Fundamentals of Engineering Project Management	3
EGS 6628	Advanced Practices in Engineering Project Management	3
EGS 6681	Advanced Engineering Leadership	3
EMA 6581	Polymeric Biomaterials	3
ESI 6900	Principles of Engineering Practice	1-4

### Student Learning Outcomes

## Industrial and systems engineering (PHD)

#### SLO 1 Knowledge

Basic proficiency in the core methodological areas of operations research and industrial engineering, including mathematical modeling and optimization theory and algorithms

#### SLO 2 Professional Behavior

Ability to effectively and professionally communicate industrial engineering concepts and information in lecture format

#### SLO 3 Skills

Ability to assimilate foundational material, describe important research contributions, and independently plan future research activities that advance the state-of-the-art in the student's field of expertise

#### SLO 4 Knowledge

Contribution of significant new research to the student's field of expertise, either in theoretical foundations or practical applications

## Industrial & Systems Engineering (Me & MS)

#### SLO 1 Knowledge

Proficiency in the core methodological areas of operations research and industrial engineering, including mathematical modeling and analysis of business problems

#### SLO 2 Skills

Ability to apply methodology in the customized development of solutions for business problems, and the use of information technologies for solution delivery

#### SLO 3 Professional Behavior

Ability to effectively and professionally communicate industrial engineering concepts and information in written and oral forms