

# SYSTEMS ENGINEERING

## Systems Engineering Master's Degree

Administered by the Department of Industrial and Manufacturing Systems Engineering

The Systems Engineering Program focuses on developing an individual's analytical skills to design, evaluate, and build modern complex engineered systems. Engineers who can conceptualize, model, and integrate hardware, software, data, and humans are critical in technology driven multi-disciplinary design teams. The Iowa State University Master of Engineering in Systems Engineering program is designed to train engineers to excel in the technology driven design environment commonly found in developing modern complex engineered systems. The program can be completed online or in residence, part-time or full-time.

### Admission Requirements

To be considered for admission, the applicant should have a bachelor's degree in engineering or related field from a college, university, or technical school of recognized standing. Non-engineering backgrounds will be considered on a case-by-case basis. High academic achievement or other persuasive evidence of professional accomplishments is expected for admission to the program. The GRE is not required.

Applicants for admission to this program apply through the ISU Graduate College. Each applicant must submit:

- Application and application fee
- Official academic transcripts
- Three letters of recommendation
- Resume

Applications should be submitted as early as possible before the beginning of the semester for which admission is sought. Individuals may also take up to nine credits at Iowa State as a non-degree seeking student and then transfer them to the program when they are admitted. (<https://iowastateonline.iastate.edu/apply-and-enroll/>).

## Degree Requirements

(10 courses total = 30 credits)

### Intro Core (required first year)

IE 5630	Engineering and Systems Management	3
IE 5650	Systems Engineering and Analysis	3

### Core (required)

IE 5640	Decision Analysis	3
IE 5700	Systems Engineering and Project Management	3
IE 5850	Requirements and Architecture Engineering	3

### Electives

IE 4480	Manufacturing Systems Engineering	3
IE 4520	Introduction To Systems Engineering And Analysis	3
IE 5030	Introduction to Sustainable Production Systems	3
IE 5200	Engineering Problem Solving with R	3
IE 5600	Engineering Risk Analysis	3
IE 5610	Total Quality Management	3
IE 5720	Design and Evaluation of Human-Computer Interaction	3
IE 5770	Human Factors	3
IE 5810	e-Commerce Systems Engineering	3
IE 5820	Enterprise Modeling and Integration	3
ME 5250	Optimization Methods for Complex Designs	3
AERE 5630	Introduction to Multidisciplinary Design Optimization	3
One course from any graduate program		3

Students working in research and development who are interested in furthering their research skills may select a creative component option as part of their supporting courses.

## Systems Engineering Certificate

(4 courses total = 12 credits)

### Intro Core (required first year)

IE 5630	Engineering and Systems Management	3
IE 5650	Systems Engineering and Analysis	3

### Core (required to pick 2)

IE 5600	Engineering Risk Analysis	3
IE 5640	Decision Analysis	3
IE 5700	Systems Engineering and Project Management	3
IE 5850	Requirements and Architecture Engineering	3

Other focus areas in related disciplines, such as systems engineering, human factors, supply chain management, or manufacturing, may - with the pre-approval of the major professor - be substituted for supporting courses. A program of study is developed by the student and academic advisor to fit individual needs.

Students working in research and development who are interested in furthering their research skills may select a creative component option as part of their supporting courses.