

# MS INDUSTRIAL ENGINEERING

## Program Learning Outcomes

After successfully completing the requirements of the Master of Science in Industrial Engineering, students will be able to:

1. Summarize and synthesize state-of-the art knowledge in a selected topic in the field of Industrial and Manufacturing Engineering.
2. Apply scientific methods to investigate industry-driven research projects (problem articulation; hypothesis formulation; data collection, management, and analysis; implementation and dissemination of results).
3. Make data-driven engineering decisions.
4. Communicate appropriate information in both written and oral format, based on the audience setting and audience's background.
5. Work productively, respectfully, and professionally as a member of a team; exhibit leadership, ethical conduct, and community values.

The MS IE program has flexible curriculum allowing the student a wide choice in course selection. The program requires a minimum 45 quarter credits of course work in the 400 or 500 level. Of the 45 units, 22 are technical electives. Student can choose technical elective courses from the Industrial and Manufacturing Engineering (IME) department as well as outside the IME department. Flexibility is emphasized so that the student and his/her advisor can structure a degree plan tailored to the individual needs of the student. Only those letter-graded courses count toward satisfying the total unit requirement for the degree. Courses on a credit/no credit basis are not allowed in the formal study plan. No audit credits are permitted.

The MS IE program requires a thesis; the student's thesis topic must be approved by his/her graduate committee, consisting of three committee members. Both an oral defense and a written thesis are required. The thesis will be reviewed by the Graduate Education Office and published at the Digital Commons.

### Required Courses

IME 503	Applied Statistical Methods in Engineering <sup>1</sup>	4
IME 507	Graduate Seminar	2
IME 556	Technological Project Management <sup>2</sup>	4
IME 580	Manufacturing Systems <sup>3</sup>	4
IME 599	Thesis	9

### Approved Electives

Select from the following <sup>4,5</sup>		22
IME 500	Individual Study	
IME 510	Systems Engineering I	
IME 511	Systems Engineering II	
IME 520	Advanced Information Systems for Operations	
IME 527	Design of Experiments	
IME 535	Change Management for Engineering Leaders	
IME 541	Advanced Operations Research	
IME 542	Applied Reliability Engineering	

IME 543	Applied Human Factors
IME 544	Advanced Topics in Engineering Economy
IME 545	Advanced Topics in Simulation
IME 546	Large-Scale Optimization
IME 549	Network Analysis and Optimization
IME 565	Predictive Data Analytics for Engineers
IME 570	Selected Advanced Topics
IME 571	Selected Advanced Laboratory
IME 577	Engineering Entrepreneurship
STAT 416	Statistical Analysis of Time Series
STAT 418	Categorical Data Analysis
STAT 419	Applied Multivariate Statistics
STAT 530	Statistical Computing with SAS
STAT 531	Statistical Computing with R

**Total units** **45**

- 1 Students with a B+ or better grade in IME 326 or IME 327 may substitute IME 503 with another statistics related course such as IME 527, STAT 416, STAT 418, STAT 419, STAT 530, or STAT 531 upon approval of the graduate coordinator.
- 2 Students with a B+ or better grade in IME 303 may substitute IME 556 with another approved technical elective course.
- 3 Course cannot be taken by students who have already received credit for IME 410. Another course may substitute, with the approval of the graduate coordinator.
- 4 Students may take other 400 or 500 level courses after consultation with and approval by advisor and the graduate coordinator.
- 5 400 level courses may not exceed 18 units in total.