

# Industrial and Management Systems Engineering

The mission of the undergraduate program in Industrial and Management Systems Engineering (IMSE) is to produce graduates well-grounded in industrial and management systems engineering knowledge and skills consistent with the land-grant mission of MSU. Graduates will be prepared to be productive citizens and contributors to the economic well-being of employers. The Montana State University Industrial & Management Systems Engineering Program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org> (<http://www.abet.org/>) under the commission's General Criteria and Program Criteria for Industrial and Similarly Named Programs.

The educational objectives for the IMSE program are that Industrial and Management Systems Engineering graduates will:

1. Use industrial and management systems engineering tools and knowledge in their chosen career paths.
2. Employ effective communication with a range of audiences.
3. Display effective teamwork when working with persons from diverse backgrounds, disciplines and skill sets.
4. Engage in professional development throughout their careers.
5. Contribute to industry and society, including involvement in professional and other service activities.
6. Design, manage, improve, and integrate systems across a broad range of organizations.
7. Participate in ethical leadership in design and operational activities that contribute to their organization and community.

The undergraduate curriculum in Industrial and Management Systems Engineering (IMSE) includes mathematics, basic sciences, humanities, social sciences, engineering sciences, design, and communication courses distributed over a four-year period. An important feature of the program is to teach students to foster the ability to comprehend, define, and analyze problems; synthesize alternatives; and rationally choose appropriate solutions. This requires a broad technical education that motivates life-long learning to keep pace with technological and social changes.

Industrial and Management Systems Engineering is a broad engineering discipline. IMSEs are "people-oriented problem solvers" who enjoy diversity in their assignments and careers, and are employed in every facet of American business and industry. They are uniquely qualified to analyze a company's customer needs, relate those to products or services, and examine the flow of materials, processes, people and information to "re-engineer" how people work. IMSE alumni include plant managers, manufacturing engineers, change agents, hospital administrators, consultants, quality assurance managers and engineers, technical sales engineers, production supervisors, and department heads. Today IMSEs are active in all kinds of manufacturing and in service operations such as hospitals, banks, airlines, transportation and distribution companies, retailers, utilities, and local, state, and federal governments.

The IMSE is an integrator of resources, people, material, and equipment. This is accomplished by designing systems so that the right people with the proper mix of skills, combined with the right quantities of equipment and materials, are available at the right time to produce a product or provide a service at a cost that will allow a profit to be made. Since these professionals frequently work on problem solving teams, the ability to communicate, coordinate, and work with others is essential. These qualities make the Industrial and Management Systems Engineer a valued asset for most any organization.

## Graduate Program

Students who have graduated from a four-year degree program which has sharpened their mathematical and communication skills will greatly benefit by completing the Master of Science degree in Industrial & Management Engineering or the Doctor of Philosophy in Engineering with Industrial Engineering option. Emphases in inclusive design, data analytics and management systems are available. Further details may be found in the Graduate Catalog.

## Student Performance and Retention Requirements

No further requirements apply in order to advance in the Industrial and Management Systems Engineering Program.

Freshman Year	Credits	
	Fall	Spring
EIND 101 - Introduction to Industrial & Management Systems Engineering	1	
CHMY 141 - College Chemistry I & CHMY 142 - College Chemistry I Lab	4	
M 171Q - Calculus I	4	
WRIT 101W - College Writing I	3	
University Core Elective	3	
COMX 111US - Introduction to Public Speaking		3
EIND 142 - Introduction to Systems Engineering		2
M 172 - Calculus II		4
PHSX 220 - Physics I with Calculus		4
University Core Elective		3
Year Total:	15	16
Sophomore Year	Credits	
	Fall	Spring
EGEN 201 - Engineering Mechanics-Statics	3	
EMAT 251 - Materials Structures and Prop	3	
M 273 - Multivariable Calculus	4	
PHSX 222 - Physics II with Calculus	4	
University Core Elective	3	
CSCI 127 - Joy and Beauty of Data		4
EGEN 205 - Mechanics of Materials		3
EIND 313 - Work Design and Analysis		3
M 221 - Introduction to Linear Algebra		3
Engineering Core Elective <sup>3</sup>		3
Year Total:	17	16
Junior Year	Credits	
	Fall	Spring
EIND 300 - Engineering Management & Ethics	3	
EIND 354 - Engineering Probability and Statistics I	3	
EIND 364 - Principles of Operations Research I	3	
EIND 413 - Ergonomics & Human Factors Engineering	3	
EMEC 103 - CAE I-Engineering Graphics Communications	2	
ETME 215 - Manufacturing Processes	3	
EGEN 310R - Multidisciplinary Engineering Design		3
EGEN 325 - Engineering Economic Analysis		3
EIND 410 - Interaction Design		2
Take one of the following:		3

EIND 455 - Design of Experiments for Engineers

EIND 457 - Regres & Multivar Analysis		
EIND 464 - Prin of Operations Research II		3
EIND 458 - Production & Engineering Mgmt		3
Year Total:	17	17
<b>Senior Year</b>	<b>Credits</b>	
	<b>Fall</b>	<b>Spring</b>
EIND 371 - Introduction to Computer Integrated Manufacturing	3	
EIND 434 - Project Management for Engineers	3	
EIND 422 - Introduction to Simulation	3	
IMSE Cognate Elective <sup>2</sup>	3	
EIND 442 - Facility and Material Handling Systems Design	3	
EIND 499R - Industrial Engineering Design Capstone		3
EIND 477 - Quality Management Systems		3
EGEN 488 - Fundamentals of Engineering Exam		0
University Core Electives		3
IMSE Cognate Elective <sup>2</sup>		6
Year Total:	15	15
<b>Total Program Credits:</b>		<b>128</b>

- <sup>1</sup> Students exempt from MSU writing requirement must still complete a 3 credit writing intensive course. Pre-approved courses are WRIT 201, WRIT 221, HONR 201, HONR 202 if not used to satisfy another requirement. Students may also add 3 credits to their Industrial and Management Systems Engineering cognate, subject to advisor approval.
- <sup>2</sup> See IMSE Cognate Policy ([http://www.montana.edu/mie/students/advising\\_forms\\_spring16/IMSE%20Cognate%20Policy.pdf](http://www.montana.edu/mie/students/advising_forms_spring16/IMSE%20Cognate%20Policy.pdf)) for details.
- <sup>3</sup> Engineering Core Elective: Choose EELE 250, EGEN 202, or EGEN 324.

A minimum of 128 credits is required for graduation; 42 of these credits must be in courses numbered 300 or above.