Industrial and Management Systems Engineering

Grounded in engineering and the social sciences, our graduate program in Industrial and Management Systems Engineering (IMSE) equips students with traditional and contemporary skills to design, manage, and analyze complex human-centered systems. Graduate students pursue advanced technical topics to design, analyze and manage systems that can improve the effectiveness and efficiency of businesses, non-profit organizations, and governments. Since all these systems involve humans and impact the social and physical environment, these systems are most successful when they combine technical solutions with social responsibility, defined as transparent and ethical behavior that contributes to sustainable development, ensures health and welfare of society, incorporates stakeholder expectations, complies with international laws and norms, and is integrated across all systems that impact society and the environment.

Thus, the vision of the program is to integrate technical depth with social awareness from a multidisciplinary (i.e., systems) point of view.

The Master of Science degree in Industrial and Management Systems Engineering degree may be accomplished under the thesis option or professional option. Under either option, a program of study is arranged for each student according to their particular goal.

Admission

The minimum requirement for admission is a Bachelor of Science degree and evidence of an ability to maintain a minimum 3.0 grade point average while pursuing a graduate degree. Applicants without a degree in Industrial Engineering (or similar) are eligible to apply, but may be required to make up subject matter deficiencies upon admission. For complete information, refer to the Admission Policies and Application Requirements sections in the department website. Successful applicants are accepted into both the department and The Graduate School.

Below are the GRE and TOEFL scores the graduate committee uses as guidelines in admissions decisions. The committee will consider lower scores with other excellent qualifications, but these higher scores indicate a better chance of success in this program.

- TOEFL average score: 84
- TOEFL preferred score: 99
- IELTS minimum score: 6.5

Degree Requirements

Students complete the M.S. degree in Industrial and Management Systems Engineering under the thesis option (Plan A) or professional option (Plan B). Plan A requires a research experience culminating in a master's thesis. Students following Plan B choose additional coursework and a graduate project or internship in lieu of completing a thesis. Plan B students complete the graduate project or internship under the supervision of a professor, culminating in a written report and oral presentation. All candidates for the M.S. degree must pass an oral comprehensive examination near the completion of their graduate program. Specific requirements for each plan are outlined below.

Accelerated M.S. Plan

The Accelerated Master of Science degree program is designed to allow qualified Industrial & Management Systems Engineering (IMSE) students and Financial Engineering (EFIN) students (EFIN students must also complete the Engineering Management Minor) to complete the IMSE Master of Science degree requirements by extending their period of study one additional year past the traditional four-year period of undergraduate study.

The IMSE Accelerated Masters program can be completed by integrating both graduate and undergraduate course requirements in the final two years of the combined period of study. Per the Board of Regents approval, this integration allows up to 12 credits to be reserved towards the M.S. while the student is still an undergraduate and it allows up to six credits of 400-level IMSE courses to satisfy credit requirements of both the B.S. undergraduate degree and the M.S. graduate degree.

The B.S. and B.S. with minor degree requirements must be completed before completion of the M.S. degree. A student who enters the program, but does not complete it in accordance with the simultaneous enrollment policies of the Graduate School will default to the standard M.S. degree program and loses the ability to count EIND 400 level courses taken as an undergraduate towards any future graduate degree at MSU.

Plan A - Thesis Option

Students chose a focus area of Inclusive Design, Management Systems or Data Analytics; and a thesis topic consistent with that focus area. Then, students complete a minimum 31 credits in the chosen focus area (12 credits from core course list + 10 credits of thesis + 9 credits from elective course list).

NOTE: EIND 490, EIND 492, EIND 499, EIND 575, and EIND 598 cannot be used towards Plan A course requirements. The final graduate plan of study must comply with Graduate School Policy (http://www.montana.edu/gradschool/policy/degreq_general.html) including the requirement that the number of 5xx-level course credits must be equal to two-thirds (2/3) of the total graded coursework, including Thesis Research credits (590 (http://catalog.montana.edu/search/?P=EIND+590)).

FOCUS AREA: INCLUSIVE DESIGN

Core Courses :		**(22 credits)**
EIND 510	Usability and Inclusive Design	3
EIND 511	Advanced Human Factors	3
EIND 500	Engineering Organizational Change and Innovation	3
or EIND 574	Management Engineering Systems	
EIND 554	DOE for Engineers	3
or EIND 557	Regression & Multivar Analysis	
EIND 590	Master's Thesis	10
Elective Courses:		**(9 credits)**
EIND 410 & EIND 411	Interaction Design and Interaction Design Project	3
EIND 413	Ergonomics & Human Factors Engineering	3
EIND 513	Human Factors in Complex Systems	3
EIND 592	Independent Study	3
PSYX 461	Indust & Organiz Psych	3
PSYX 477	Science of Psych Well-Being	3
PSYX 562	Psychology of Prejudice, Stereotypes, Discrimination and Stigma	3
CHTH 503	Community-Based Participatory Research: Research, Practice, and Policy	3
NRSG 610	Health Care Informatics	3

FOCUS AREA: MANAGEMENT SYSTEMS

Core Courses:		**(22 credits)**

EIND 500	Engineering Organizational Change and Innovation	3
EIND 574	Management Engineering Systems	3
EIND 510	Usability and Inclusive Design	3
or EIND 511	Advanced Human Factors	
EIND 554	DOE for Engineers	3
or EIND 557	Regression & Multivar Analysis	
EIND 590	Master's Thesis	10
Elective Courses:		**(9 credits)**
EIND 434	Project Management for Engineers	3
EIND 458	Production & Engineering Mgmt	3
EIND 477	Quality Management Systems	3
EIND 506	Healthcare Delivery Systems	3
EIND 525	Multi-Attribute Analysis	3
EIND 592	Independent Study	3
BMGT 464	International Management	3
BMGT 466	Team and Process Facilitation	3
NRSM 421	Holistic Thought/Mgmt	4
PSCI 520	Government Leadership & Ethics	3
PSCI 525	Non-Profit Management	3
PSCI 530	Tools of Public Administration	3
PSCI 554	Foundations of Public Administration	3
PSCI 558	Public Organization Dynamics	3
CHTH 503	Community-Based Participatory Research: Research, Practice, and Policy	3
NRSG 610	Health Care Informatics	3

FOCUS AREA: DATA ANALYTICS

Core Courses:		**(22 credits)**
EIND 554	DOE for Engineers	3
EIND 557	Regression & Multivar Analysis	3
EIND 500	Engineering Organizational Change and Innovation	3
or EIND 574	Management Engineering Systems	
EIND 510	Usability and Inclusive Design	3
or EIND 511	Advanced Human Factors	
EIND 590	Master's Thesis	10
Elective Courses:		**(9 credits)**
EIND 422	Introduction to Simulation	3
EIND 464	Prin of Operations Research II	3
EIND 468	Managerial Forecasting & Decision Analysis	3
or EIND 558	Manage Forecast & Dec Analysis	
EIND 509	Systems Simulation	3
EIND 592	Independent Study	3
BMGT 405	Supply Chain Analytics	3
STAT 421	Probability Theory	3
STAT 431	Nonparametric Statistics	3
STAT 439	Introduction to Categorical Data Analysis	3
CHTH 503	Community-Based Participatory Research: Research, Practice, and Policy	3
NRSG 610	Health Care Informatics	3

Plan B - Professional Option

Students chose a focus area of Inclusive Design, Management Systems or Data Analytics. They then complete a minimum of 33 credits in the chosen focus area (18 credits from core course list + 15 credits from elective course list). Students must complete 6 credits of either a project or internship, but not both.

NOTE: EIND 490, EIND 492 and EIND 499 cannot be used towards Plan B course requirements. The final graduate plan of study must comply with Graduate School Policy (http://www.montana.edu/gradschool/policy/degreq_general.html) including the requirement that the number of 5xx-level course credits must be equal to two-thirds (2/3) of the total graded coursework.

FOCUS AREA: INCLUSIVE DESIGN

Core Courses:		**(18 credits)**
EIND 510	Usability and Inclusive Design	3
EIND 511	Advanced Human Factors	3
EIND 500	Engineering Organizational Change and Innovation	3
or EIND 574	Management Engineering Systems	
EIND 554	DOE for Engineers	3
or EIND 557	Regression & Multivar Analysis	
EIND 575	Research or Prof Paper/Project	6
or EIND 598	Internship	
Elective Courses:		**(15 credits)**
EIND 410 & EIND 411	Interaction Design and Interaction Design Project	3
EIND 413	Ergonomics & Human Factors Engineering	3
EIND 513	Human Factors in Complex Systems	3
EIND 592	Independent Study	3
PSYX 461	Indust & Organiz Psych	3
PSYX 477	Science of Psych Well-Being	3
PSYX 562	Psychology of Prejudice, Stereotypes, Discrimination and Stigma	3
CHTH 503	Community-Based Participatory Research: Research, Practice, and Policy	3
NRSG 610	Health Care Informatics	3

FOCUS AREA: MANAGEMENT SYSTEMS

Core Courses:		**(18 credits)**
EIND 500	Engineering Organizational Change and Innovation	3
EIND 574	Management Engineering Systems	3
EIND 510	Usability and Inclusive Design	3
or EIND 511	Advanced Human Factors	
EIND 554	DOE for Engineers	3
or EIND 557	Regression & Multivar Analysis	
EIND 575	Research or Prof Paper/Project	6
or EIND 598	Internship	
Elective Courses:		**(15 credits)**
EIND 434	Project Management for Engineers	3
EIND 458	Production & Engineering Mgmt	3
EIND 477	Quality Management Systems	3

EIND 506	Healthcare Delivery Systems	3
EIND 525	Multi-Attribute Analysis	3
EIND 592	Independent Study	3
BMGT 406	Negotiation/Dispute Resolution	3
BMGT 410	Sustainable Business Practices	3
BMGT 464	International Management	3
BMGT 466	Team and Process Facilitation	3
NRSM 421	Holistic Thought/Mgmt	4
PSCI 520	Government Leadership & Ethics	3
PSCI 525	Non-Profit Management	3
PSCI 530	Tools of Public Administration	3
PSCI 554	Foundations of Public Administration	3
PSCI 558	Public Organization Dynamics	3

FOCUS AREA: DATA ANALYTICS

Core Courses:		**(18 credits)**
EIND 554	DOE for Engineers	3
EIND 557	Regression & Multivar Analysis	3
EIND 500	Engineering Organizational Change and Innovation	3
or EIND 574	Management Engineering Systems	
EIND 510	Usability and Inclusive Design	3
or EIND 511	Advanced Human Factors	
EIND 575	Research or Prof Paper/Project	6
or EIND 598	Internship	
Elective Courses:		
EIND 422	Introduction to Simulation	3
EIND 464	Prin of Operations Research II	3
EIND 468	Managerial Forecasting & Decision Analysis	3
or EIND 558	Manage Forecast & Dec Analysis	
EIND 509	Systems Simulation	3
EIND 592	Independent Study	3
BMGT 405	Supply Chain Analytics	3
STAT 421	Probability Theory	3
STAT 431	Nonparametric Statistics	3
STAT 439	Introduction to Categorical Data Analysis	3