

INDUSTRIAL AND SYSTEMS ENGINEERING (B.S.)

To graduate in this program, a grade of C or better is required in all math, science, and engineering courses used to fulfill degree requirements. Students may accumulate no more than 12 credit hours of D or F in industrial and systems engineering (ISE) courses. Included in this number are multiple repeats of a single class or single repeats of multiple classes, as well as courses transferred from other institutions. Students who exceed 12 credits of D or F in ISE courses will be permanently disqualified from pursuing the B.S. degree in Industrial and Systems Engineering at the University of Idaho. To complete this degree, all students must show proof of registering for the Fundamentals of Engineering (FE) Exam.

Curriculum

Code	Title	Hours
Basic Math and Science		
MATH 1170	Calculus I	4
MATH 1750	Calculus II	4
MATH 2750	Calculus III	3
MATH 3300	Linear Algebra	3
STAT 3010	Probability and Statistics	3
CHEM 1111	General Chemistry I	3
CHEM 1111L	General Chemistry I Laboratory	1
PHYS 2110	Engineering Physics I	3
PHYS 2110L	Laboratory Physics I	1
PHYS 2120	Engineering Physics II	3
PHYS 2120L	Laboratory Physics II	1
Engineering Science		
ENGR 1230	First Year Engineering	2
ENGR 2100	Engineering Statics	3
ENGR 2120	Python Programming Essentials	3
ENGR 2150	Elements of Materials Science	3
ENGR 2400	Introduction to Electrical Circuits	3
ENGR 3600	Engineering Economy	2
ISE Required Courses		
ISE 2321	Statistical Methods for Process and Quality Control	3
ISE 3311	Introduction to Operations Research	3
ISE 3312	Model-Based Simulation and Decision Support Systems	3
ISE 3331	Work Systems Engineering	3

ISE 3361	Information Systems Engineering	3
ISE 3362	Operational Excellence	3
ISE 4322	Experimental Design and Analysis of Industrial Processes	3
ISE 4341	Artificial Intelligence/ Machine Learning Integration for ISE	3
ISE 4363	Production, Distribution, and Inventory Planning and Control	3
ISE 4364	Facilities Design and Material Handling	3
ISE 4371	Engineering Project Management	3
ISE 4372	Manufacturing Costing Systems	3
ISE 4381	Approaches to Managing Complex Systems	3
ISE 4397	Industrial & Systems Engineering Capstone I	3
ISE 4398	Industrial & Systems Engineering Capstone II	3
CS 4553	Robotic Systems Engineering I	3
ETEC 3330	Industrial Electronics and Control Systems	3
ETEC 3530	Manufacturing Systems	3
Electives		
PHIL 1103	Introduction to Ethics	3
PSYC 1101	Introduction to Psychology	3
<i>Econ elective options</i>		3
ECON 2201	Principles of Macroeconomics	
ECON 2202	Principles of Microeconomics	
ECON 2720	Foundations of Economic Analysis	

Total Hours 108

Four-Year Plan

Fall Term 1		Hours
ENGL 1101	Writing and Rhetoric I	3
MATH 1170	Calculus I	4
ENGR 1230	First Year Engineering	2
CHEM 1111	General Chemistry I	3
CHEM 1111L	General Chemistry I Laboratory	1
Humanistic and Artistic Ways of Knowing Course		3

Hours 16

Spring Term 1

ENGL 1102	Writing and Rhetoric II	3
MATH 1750	Calculus II	4
PSYC 1101	Introduction to Psychology	3
COMM 1101	Fundamentals of Oral Communication	3
PHYS 2110	Engineering Physics I	3
PHYS 2110L	Laboratory Physics I	1
Hours		17

Fall Term 2

MATH 2750	Calculus III	3
ENGR 2100	Engineering Statics	3
STAT 3010	Probability and Statistics	3
PHYS 2120	Engineering Physics II	3
PHYS 2120L	Laboratory Physics II	1
American Experience Course		3
Hours		16

Spring Term 2

MATH 3300	Linear Algebra	3
ENGR 2150	Elements of Materials Science	3
ENGR 2120	Python Programming Essentials	3
ECON 2201 or ECON 2202 or ECON 2720	Principles of Macroeconomics or Principles of Microeconomics or Foundations of Economic Analysis	3
International Course		3
Hours		15

Fall Term 3

ENGR 3600	Engineering Economy	2
ETEC 3530	Manufacturing Systems	3
ENGR 2400	Introduction to Electrical Circuits	3
PHIL 1103	Introduction to Ethics	3
ISE 2321	Statistical Methods for Process and Quality Control	3
ISE 3311	Introduction to Operations Research	3
Hours		17

Spring Term 3

ETEC 3330	Industrial Electronics and Control Systems	3
ISE 3312	Model-Based Simulation and Decision Support Systems	3
ISE 3331	Work Systems Engineering	3

ISE 3361	Information Systems Engineering	3
ISE 3362	Operational Excellence	3
Hours		15

Fall Term 4

ISE 4363	Production, Distribution, and Inventory Planning and Control	3
ISE 4371	Engineering Project Management	3
ISE 4371	Engineering Project Management	3
ISE 4381	Approaches to Managing Complex Systems	3
ISE 4397	Industrial & Systems Engineering Capstone I	3
Hours		15

Spring Term 4

CS 4553	Robotic Systems Engineering I	3
ISE 4322	Experimental Design and Analysis of Industrial Processes	3
ISE 4341	Artificial Intelligence/ Machine Learning Integration for ISE	3
ISE 4364	Facilities Design and Material Handling	3
ISE 4398	Industrial & Systems Engineering Capstone II	3
Hours		15
Total Hours		126

Five-Year Plan

Fall Term 1		Hours
ENGL 1101	Writing and Rhetoric I	3
MATH 1143	Precalculus I: Algebra	3
MATH 1144	Precalculus II: Trigonometry	1
ENGR 1230	First Year Engineering	2
CHEM 1111	General Chemistry I	3
CHEM 1111L	General Chemistry I Laboratory	1
Hours		13

Spring Term 1

ENGL 1102	Writing and Rhetoric II	3
MATH 1170	Calculus I	4
PSYC 1101	Introduction to Psychology	3
PHYS 2110	Engineering Physics I	3

PHYS 2110L	Laboratory Physics I	1
Hours		14
Fall Term 2		
ENGR 2120	Python Programming Essentials	3
MATH 1750	Calculus II	4
PHYS 2120	Engineering Physics II	3
PHYS 2120L	Laboratory Physics II	1
Humanistic and Artistic Ways of Knowing Course		3
Hours		14
Spring Term 2		
MATH 3300	Linear Algebra	3
COMM 1101	Fundamentals of Oral Communication	3
STAT 3010	Probability and Statistics	3
ECON 2201 or ECON 2202 or ECON 2720	Principles of Macroeconomics or Principles of Microeconomics or Foundations of Economic Analysis	3
Hours		12
Fall Term 3		
ENGR 2100	Engineering Statics	3
ENGR 2400	Introduction to Electrical Circuits	3
ETEC 3530	Manufacturing Systems	3
ISE 2321	Statistical Methods for Process and Quality Control	3
MATH 2750	Calculus III	3
Hours		15
Spring Term 3		
ETEC 3330	Industrial Electronics and Control Systems	3
ENGR 2150	Elements of Materials Science	3
ISE 3312	Model-Based Simulation and Decision Support Systems	3
ISE 3331	Work Systems Engineering	3
ENGR 3600	Engineering Economy	2
Hours		14
Fall Term 4		
PHIL 1103	Introduction to Ethics	3
ISE 3311	Introduction to Operations Research	3
ISE 3361	Information Systems Engineering	3

American Experience Course		3
Hours		12
Spring Term 4		
CS 4553	Robotic Systems Engineering I	3
ISE 3362	Operational Excellence	3
ISE 4371	Engineering Project Management	3
International Course		3
Hours		12
Fall Term 5		
ISE 4363	Production, Distribution, and Inventory Planning and Control	3
ISE 4372	Manufacturing Costing Systems	3
ISE 4381	Approaches to Managing Complex Systems	3
ISE 4397	Industrial & Systems Engineering Capstone I	3
Hours		12
Spring Term 5		
ISE 4322	Experimental Design and Analysis of Industrial Processes	3
ISE 4341	Artificial Intelligence/ Machine Learning Integration for ISE	3
ISE 4364	Facilities Design and Material Handling	3
ISE 4398	Industrial & Systems Engineering Capstone II	3
Hours		12
Total Hours		130

Program Educational Objectives: Within four to six years after completing their B.S. in industrial and systems engineering, we expect our graduates to:

1. Become formal and informal leaders in designing, analyzing, innovating, integrating, managing, and retiring modern complex engineered systems in all sectors of local, regional, national, and global industries.
2. Use systems thinking to understand and solve technical problems in an increasingly complex and changing global environment by integrating and balancing business, equipment, materials, energy, information, human, environmental, and societal factors.
3. Become valuable contributors to society and to their organization by improving or evolving their organizations through the application of systems thinking, production methods and processes, and management methodologies and tools.
4. Embrace life-long learning and career advancement by pursuing and embracing professional/career development activities, education, certifications, licensure, and by joining and actively participating in professional societies.

Student Outcomes: By graduation, students will be able to attain the following learning outcomes:

1. Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global cultural, social, environmental, and economic factors.
3. Ability to communicate effectively with a range of audiences.
4. Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. Ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Ability to develop and conduct appropriate testing or experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Ability to acquire and apply new knowledge as needed, using appropriate learning strategies.