



2020 Undergraduate Handbook

Department of Industrial and Manufacturing Systems Engineering

Iowa State University

Last updated 7.20.2020 (REOF)

For most current information please see your Academic Adviser.

Welcome

Dear Industrial Engineering Undergraduate,

The Industrial and Manufacturing Systems Engineering (IMSE) Department welcomes you to Iowa State University and the College of Engineering. The College of Engineering has offered a degree in Industrial Engineering since 1946 and continues to provide a program that is based on the fundamentals of engineering science as well as the latest and most innovative technology available.

We are pleased to have you as a student in our department and thank you for joining the IMSE family.

Sincerely,

The Faculty and Staff of the IMSE Department

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Part 1: General Information

Our Mission

These are the primary goals of the IMSE Department:

- To develop technically qualified industrial engineers equipped with the necessary analytical, data-based decision making, computing, communication, teamwork and leadership skills for the design, analysis, implementation, and management of production, information, and service systems;
- To expand the field of knowledge in industrial and manufacturing systems engineering with emphases on manufacturing systems, information engineering, human factors, and applied operations research; and
- To provide continuing education and outreach activities in our professional areas.

Undergraduate Study

The Industrial Engineering Program of this curriculum is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

The Industrial Engineering (IE) Program educates its future graduates to accomplish its educational objectives in their early careers. Specifically, the IE curriculum prepares its majors so that, within a few years after graduation, graduate attainments are

1. Effective industrial engineering solutions and appropriate communications with stakeholders regarding such solutions.
2. Contributions to team goals through productive team interactions and leadership.
3. New skills and knowledge that advance professional practice and enable career advancement.

Details on industrial engineering program outcomes that foster the attainment of these objectives are available at the appropriate sections of: www.imse.iastate.edu

The industrial engineering undergraduate curriculum provides students with fundamental knowledge in mathematics and science, engineering science, social science, and humanities as well as professional industrial engineering course work. Management electives provide students with an opportunity to become familiar with modern business practices that they will encounter in their career. A senior capstone design course provides students with an opportunity to solve open-ended industrial problems with an industrial partner. The cooperative education program provides students with real world experience in the profession and a good perspective on career choices. Students are encouraged to participate in international experiences through exchange programs.

IMSE by the Numbers

Faculty	29 faculty members
Staff	10 staff members
Students	504 undergraduates and 169 graduate students (8/2018)

Alumni	More than 5,000 alumni worldwide
Facilities	16 labs

A Brief History of the Department

It begins...

The Twenties

1919 ... An IE option is introduced for mechanical engineers at what was then Iowa State College. The program is directed by J.O. Keller, who in 1911 received the first IE degree awarded from Penn State.

1926 ... The general engineering curriculum is initiated.

1929 ... The Department of General Engineering (GE) is established, with Frank Paine as head. The curriculum has only two GE courses – both personnel-related – with the rest made up of electrical, mechanical, and civil engineering courses.

The Forties

1942 ... Joseph Walkup becomes department head.

1946 ... An IE option is offered in the GE department.

1948 ... The department starts a student AIIE organization.

The foundation...

The Fifties and Sixties

1953 ... A local Gamma Epsilon Sigma honorary society is established.

1956 ... The department's name is changed from general engineering to industrial engineering. By 1957 the department has 197 undergraduates and three lab "rooms" in Marston Hall. The first students with a B.S. in industrial engineering graduate.

1961 ... The engineering operations curriculum begins.

The Seventies

1973 ... Wilber Meier becomes department chair.

1974 ... Keith McRoberts becomes department chair. Alpha Pi Mu, the national IE honor society, is started in the department.

From the Fifties to the Seventies, the curriculum was made up of courses split about equally between engineering and management. The department was nationally recognized for the quality of its curriculum, faculty, and students. By 1987 the student body numbered approximately 551.

Impetus for change...

The Late Eighties to Mid-Nineties

1988 ... At a retreat, engineering DEOs vote to combine the IE and ME departments. The general feeling is that much of the IE curriculum duplicates that of the recently accredited business college, a theme that leads to many subsequent discussions and decisions regarding the department's future.

1989 ... The ISU Long Range Planning Committee Report recommends that the IE department be eliminated, a finding supported by a study initiated by the Board of Regents. The department refocuses on manufacturing and operations research to establish a unique

identity. Dean David Kao defends the department before the Board of Regents, indicating that its new focus will alleviate concerns of duplication.

1989 ... Way Kuo is named department chair.

1989 ... The department moves into the Engineering Annex, where it has six laboratory rooms.

1989 ... The Board of Regents approves a name change to the Department of Industrial and Manufacturing Systems Engineering (IMSE), with the understanding of a commitment to changing the departmental focus away from management to engineering. However, the degree granted remains a B.S. in industrial engineering.

1991 ... Changes proposed by the Board of Regents are implemented: the department replaces 40% of existing curriculum, eliminating courses in management, human resources, and project management.

1991 ... The engineering operations curriculum is transferred to the College of Engineering.

1992 ... A new Ph.D. program in industrial engineering replaces the engineering valuation Ph.D. The M.S. in operations research is approved.

1993 ... Geraldine Montag is appointed interim chair.

1995 ... An interdisciplinary M.S. in systems engineering begins, managed by the IMSE department.

1996 ... Pius Egbelu is appointed department chair.

1997 ... IMSE has 167 undergraduates. The Executive In Residence program begins in IMSE.

Management emphasis returns...

Entering the 21st century

1999 ... With the addition of three electives and an option to take two additional courses, the department moves to make engineering management a significant part of the IE curriculum. This is a result of input from our Industrial Advisory Council and companies hiring our students, as well as the students themselves. In addition, as a result of their coursework, many students now minor in management. Based on our students' hiring patterns, more manufacturing classes are also added to the curriculum. The department moves into Black Engineering Building, where we have 16 laboratory facilities.

2000 ... Patrick Patterson becomes interim chair. An IMSE study committee meets to determine the department's strategic focus and to set long-term goals. The foci will be on manufacturing (already a strength), engineering management, enterprise computing, and information engineering. The IMSE and EE departments partner with the University of Iowa College of Business to offer an Executive M.B.A. Program. The program's home is in the IMSE department.

2001 ... Patrick Patterson is appointed department chair.

2002 ... "Information Technology throughout the Curriculum" initiative is instituted. We have approximately 265 students in the undergraduate program, 40 M.S. students, 25 Ph.D.s, and about 120 students in our M.S. in Systems Engineering Program. We are also coordinating and providing instruction for an Executive M.B.A. Program, in which participants receive a master's in systems engineering from ISU and an M.B.A. from The University of Iowa.

- 2003 ... The Joseph K. Walkup Prominence in Industrial Engineering Award and the Walkup Distinguished Lecturers Series are initiated.
- 2004 ... A BSIE/MBA degree program is established.
- 2006 ... Dr. Sarah Ryan is appointed interim department chair.
- 2007 ... Dr. Gary Mirka is appointed department chair.
- 2009 ... Engineering Sales minor is established.
- 2011 ... Dr. Max Morris is appointed interim department chair.
- 2011 ... Dr. Janis Terpenney is appointed department chair.
- 2013 ... MENG Engineering Management degree program is established.
- 2015 ... Dr. Frank Peters is appointed interim department chair.
- 2016 ... Dr. Gül Kremer is appointed department chair.

Part 2: Required Courses

Basic Program Requirements

The Basic Program Rule states that until students complete the Basic Program (BP), they can take 200 level or higher engineering courses for only one semester (transfer students are allowed two semesters).

Nine courses comprise what is known as the Basic Program; the courses are listed below. Students must earn at least a 2.00 (C) average in the BP in order to progress to upper-division Industrial Engineering courses.

In general, students may not take any 200+ engineering courses until the BP is complete. However, students who have only one BP course remaining may take this course concurrently with engineering courses such as IE 248 or MAT E 273, if they meet the prerequisites for these courses. These students must also have an Iowa State cumulative GPA of 2.00 or higher in order for the Basic Program to be considered complete.

Computing Your Basic Program GPA

Calculate your GPA in the BP after each semester so you can track your progress. Use the following method:

The Basic Program		Grade Values (quality points/credit)		
CHEM 167	4 credits	A	=	4.00
ENGL 150	3 credits	A-	=	3.67
		B+	=	3.33
LIB 160	1 credit	B	=	3.00
ENGR 101	R credit	B-	=	2.67
I E 148	3 credits	C+	=	2.33
MATH 165	4 credits	C	=	2.00
MATH 166	4 credits	C-	=	1.67
PHYS 221	5 credits	D+	=	1.33
		D	=	1.00
		D-	=	0.67
		F	=	0.00

1. Multiply the number of credits given for the course by the numerical value of the grade you earned. For example, assume you earned an A in CHEM 167. CHEM 167 is taken for 4 credits at Iowa State, and an A is worth 4.00 quality points (QP)/credit. So you would receive 4 credits x 4 QP/credit = 16 quality points for CHEM 167.
2. Sum your quality points.
3. Sum your credits (attempted or earned).
4. Divide the total number of quality points by the total number of credits attempted or earned. The result from step 4 is your Basic Program Grade Point Average.

Note: LIB 160 credit affects your GPA only if you fail it!

Example

Course	Credits	Grade	Quality Points
CHEM 167	4.0	A	16.00
ENGL 150	3.0	C+	6.99
ENGL 250	3.0	C	6.00
IE 148	3.0	A-	11.01
LIB 160	1	S	
MATH 165	5.0	B-	13.35
MATH 166	5.0	B	15.00
PHYS 221	5.0	C	10.00
Totals	28.0		78.35

$$\text{Basic Program GPA} = 78.35 \text{ QP} / 28.0 \text{ cr.} = 2.80$$

Completing the Basic Program

Be aware of the following policies in the College of Engineering:

- If you have taken all the BP courses but your GPA in the Basic Program is less than 2.00, your BP is not complete.
- If you have taken all the BP courses but your cumulative GPA at Iowa State is less than 2.00, your BP is not complete.

Grades earned in courses transferred to Iowa State University will not be used in calculating a transfer student's Iowa State cumulative grade point average or Basic Program GPA (effective for 2016 catalog and later; students in earlier catalogs will still use transfer course grades towards their Basic Program GPA.)

Course Requirements: 2015-2016 Catalog (Expires End of Summer 2021)

To graduate under the 2015 catalog, you are required to successfully complete 122 credits. The credits are distributed among seven areas. In the list below, please note that alternative courses are suggested in parentheses:

		<u>Credits</u>	<u>Area Total</u>
1.	Communications		
	1. SP CM 212	3	
	2. ENGL 314	3	6
2.	Social Sciences and Humanities*		
	1. U.S. Diversity elective	3	
	2. International Perspective Elective	3	
	3. An additional 6 credits from approved departmental SSH List	6	12
	* At least 6 credits must be taken within the same department.		
	* At least 6 credits must be 200-level or higher.		
3.	Basic Program		
	1. CHEM 167	4	
	2. ENGL 150	3	
	3. ENGL 250	3	
	4. ENGR 101	R	
	5. I E 148	3	
	6. LIB 160	1	
	7. MATH 165	4	
	8. MATH 166	4	
	9. PHYS 221	5	27
4.	Math and Physical Science		
	1. MATH 265	4	
	2. MATH 247	4	
	3. STAT 231	4	
	4. PHYS 222	5	17
5.	Industrial Engineering Core		
	1. I E 222	3	
	2. I E 248	3	
	3. I E 271	3	
	4. I E 305	3	
	5. I E 312	3	
	6. I E 341	3	
	7. I E 348	3	
	8. I E 361	3	
	9. I E 413	4	
	10. I E 441	3	
	11. I E 448	3	34

		<u>Credits</u>	<u>Area Total</u>
6.	Other Remaining Courses		
	1. MAT E 273	3	
	2. E M 274	3	
	3. M E 231	3	
	4. E E 442	2	
	5. Focus Electives (choose from list)	6	
	6. Management Electives (choose from list)	3	
	7. Engineering Topic Elective (choose from list)	6	26
7.	Required Seminar		
	1. I E 101	R	R
	TOTAL CREDITS		<hr/> 122

Bachelor of Science in Industrial Engineering 2015 Catalog

Total Credits Required =122

1. Communications (6 cr.)

- _____ Sp Cm 212 Fundamentals of Public Speaking (3)
- _____ Engr 314 Technical Communication (3)

2. Social Science & Humanities (12 cr.)*

- _____ U.S. Diversity (3)
- _____ International Perspectives (3)
- _____ (3)
- _____ (3)

Note: Six credits in the SSH area must be 200-level or above, and six credits must form a sequence of prerequisite or related courses.

**See the list of courses approved by the IMSE Department.*

3. Basic Program (27 cr.)

- _____ Chem 167 General Chemistry for Engineering Students (4)
or Chem 177 General Chemistry and Chemistry Lab (4)
- _____ Engr 150 Critical Thinking and Communication (3)
- _____ Engr 250 Written, Oral, Visual, & Electronic Composition (3)
- _____ Engr 101 Engineering Orientation (R)
- _____ I E 148 Information Engineering (3)
- _____ Lib 160 Introduction to Library (1)
- _____ Math 165 Calculus I (4)
- _____ Math 166 Calculus II (4)
- _____ Phys 221 Introduction to Classical Physics I (5)

4. Math and Physical Science (17 cr.)

- _____ Math 265 Calculus III (4)
- _____ Phys 222 Introduction to Classical Physics II (5)
- _____ Math 267 Elementary Differential Equations & Laplace Transforms (4)
- _____ Stat 231 Probability & Statistical Inference for Engrs (4)

5. Industrial Engineering Core (34 cr.)

- _____ I E 222 Design & Analysis Methods for System Improvements (3)
- _____ I E 248 Engineering System Design, Manufacturing Processes & Specifications (3)
- _____ I E 271 Applied Ergonomics & Work Design (3)
- _____ I E 305 Engineering Economic Analysis (3)
- _____ I E 312 Optimization (3)
- _____ I E 341 Production Systems (3)
- _____ I E 348 Solidification Processes (3)
- _____ I E 361 Statistical Quality Assurance (3)
- _____ I E 413 Stochastic Modeling, Analysis & Simulation (4)
- _____ I E 441 Industrial Engineering Design (3)
- _____ I E 448 Manufacturing Systems Engineering (3)

6. Other Remaining Courses (26 cr.)

- _____ Mat E 273 Principles of Materials Sci & Engineering (3)
- _____ E M 274 Statics of Engineering (3)
- _____ M E 231 Thermodynamics (3)
- _____ E E 442 Introduction to Circuits and Instruments (2)
- _____ Engineering Topic Elective (6)
- _____ Focus Elective (6)
- _____ Management Elective (3)

7. Required Seminar

- _____ I E 101 Industrial Engineering Profession (R)

Industrial Engineering

2015-2016 Catalog: Suggested Course Sequence

Degrees	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Semester 7	Semester 8
B.S. in IE 122 credits	MATH 165 Calc I 4 cr Placement Exam	MATH 166 Calc II 4 cr C- or better in MATH 165	MATH 265 Calc III 4 cr C- or better in MATH 166 or MATH 166H	MATH 267 Diff Eq/Lap 4 cr C- or better in MATH 166 or MATH 166H	I E 305 Engr Econ Analysis 3 cr MATH 166	I E 348 Solidif Processes 3 cr IE 248 MAT E 273 <i>Spring Only</i>	I E 413 Stoch Modeling 4 cr Math 267 Stat 231 <i>Fall Only</i>	I E 441 IE Design 3 cr IE 248, IE 271, IE 361, Credit/Enrollment in IE 341, IE 413, IE 448
	Social Sciences and Humanities Elective 3 cr	PHYS 221 Classical Phys I 5 cr Credit/enrollment in MATH 166	I E 248 Intro Mfg Processes 3 cr MATH 166, PHYS 221, Credit/enrollment in IE 101, MAT E 273 <i>Fall Only</i>	STAT 231 Prob & Stat 4 cr Credit/enrollment in MATH 265	I E 341 Production Systems 3 cr STAT 231, Credit/enrollment in IE 312 <i>Fall Only</i>	I E 361 Quality Assurance 3 cr STAT 231	ENGL 314 Tech Comm 3 cr Junior Classification ENGL 250	I E 448 Manuf Sys Engr 3 cr IE 248 IE 305 <i>Spring Only</i>
	CHEM 167 Engr Chem 4 cr MATH 140 CHEM 50 or HS Equivalent	Social Sciences and Humanities Elective 3 cr	MAT E 273 Principles of Materials Science 3 cr Soph classification, CHEM 167 or 177, MATH 165	I E 271 Appl Ergonomics 3 cr PHYS 221 <i>Spring Only</i>	I E 312 Optimization 3 cr Credit/enrollment in MATH 267 <i>Fall Only</i>	Engineering Topic Elective 3 cr	M E 231 Engineering Thermodynamics I 3 cr MATH 265, CHEM 167, PHYS 222	Focus Elective 3 cr
	IE 148 Information Engr 3 cr Credit/enrollment in MATH 142	ENGL 150 Comp I 3 cr Credit/enrollment in LIB 160	PHYS 222 Classical Phys II 5 cr PHYS 221 MATH 166	I E 222 Design & Analysis Sys Improvements 3 cr IE 248, Credit/ enrollment in IE 271 <i>Spring Only</i>	E M 274 Statics 3 cr Credit/enrollment in MATH 166 PHYS 221	Social Sciences and Humanities Elective 3 cr	Focus Elective 3 cr	Management Elective 3 cr
	ENGR 101 Orientation R cr	LIB 160 Library 1 cr	ENGL 250 or ENGL 250H Comp II 3 cr C or better in ENGL 150 or placement, Credit/enrollment in LIB 160		SP CM 212 Fund of Public Speaking 3 cr	E E 442 Intro to Circuits 2 cr MATH 267 PHYS 222	Social Sciences and Humanities Elective 3 cr	Engineering Topic Elective 3 cr
		I E 101 IE Orient R cr						
122 Total Credits	14 cr	16 cr	18 cr	14 cr	15 cr	14 cr	16 cr	15 cr

Applicable prerequisites and co-requisites are listed under each course.

Note: Please verify all prerequisites and semester offerings with current course catalog

Elective List can be found on the IMSE website at <http://www.imse.iastate.edu/undergraduate-program/advising/>

Course Descriptions can be found at: <http://catalog.iastate.edu/azcourses/>

Light blue shading indicates Basic Program classes for all Engineering Majors; Dark blue indicates the IE core, course descriptions on the back of this page

7/20/2015 SSC

Course Requirements: 2016-2017 Catalog (Expires End of Summer 2022)

To graduate under the 2016 catalog, you are required to successfully complete 122 credits. The credits are distributed among seven areas. In the list below, please note that alternative courses are suggested in parentheses:

	<u>Credits</u>	<u>Area Total</u>
1. Communications		
1. SP CM 212	3	
2. ENGL 314	3	6
2. Social Sciences and Humanities*		
1. U.S. Diversity elective	3	
2. International Perspective Elective	3	
3. An additional 6 credits from approved departmental SSH List	6	12
* At least 6 credits must be taken within the same department.		
* At least 6 credits must be 200-level or higher.		
3. Basic Program		
1. CHEM 167	4	
2. ENGL 150	3	
3. ENGL 250	3	
4. ENGR 101	R	
5. I E 148	3	
6. LIB 160	1	
7. MATH 165	4	
8. MATH 166	4	
9. PHYS 221	5	27
4. Math and Physical Science		
1. MATH 265	4	
2. MATH 247	4	
3. STAT 231	4	
4. PHYS 222	5	17
5. Industrial Engineering Core		
1. I E 222	3	
2. I E 248	3	
3. I E 271	3	
4. I E 305	3	
5. I E 312	3	
6. I E 341	3	
7. I E 348	3	
8. I E 361	3	
9. I E 413	4	
10. I E 441	3	
11. I E 448	3	34

		<u>Credits</u>	<u>Area Total</u>
6.	Other Remaining Courses		
	1. MAT E 273	3	
	2. E M 274	3	
	3. M E 231	3	
	4. E E 442	2	
	5. Focus Electives (choose from list)	6	
	6. Management Electives (choose from list)	3	
	7. Engineering Topic Elective (choose from list)	6	26
7.	Required Seminar		
	1. I E 101	R	R
	TOTAL CREDITS		<hr/> 122

Bachelor of Science in Industrial Engineering 2016 Catalog

Total Credits Required =122

1. Communications (6 cr.)

- _____ Sp Cm 212 Fundamentals of Public Speaking (3)
- _____ Engr 314 Technical Communication (3)

2. Social Science & Humanities (12 cr.)*

- _____ U.S. Diversity (3)
- _____ International Perspectives (3)
- _____ (3)
- _____ (3)

Note: Six credits in the SSH area must be 200-level or above, and six credits must form a sequence of prerequisite or related courses.

**See the list of courses approved by the IMSE Department.*

3. Basic Program (27 cr.)

- _____ Chem 167 General Chemistry for Engineering Students (4)
or Chem 177 General Chemistry and Chemistry Lab (4)
- _____ Engr 150 Critical Thinking and Communication (3)
- _____ Engr 250 Written, Oral, Visual, & Electronic Composition (3)
- _____ Engr 101 Engineering Orientation (R)
- _____ I E 148 Information Engineering (3)
- _____ Lib 160 Introduction to Library (1)
- _____ Math 165 Calculus I (4)
- _____ Math 166 Calculus II (4)
- _____ Phys 221 Introduction to Classical Physics I (5)

4. Math and Physical Science (17 cr.)

- _____ Math 265 Calculus III (4)
- _____ Phys 222 Introduction to Classical Physics II (5)
- _____ Math 267 Elementary Differential Equations & Laplace Transforms (4)
- _____ Stat 231 Probability & Statistical Inference for Engrs (4)

5. Industrial Engineering Core (34 cr.)

- _____ I E 222 Design & Analysis Methods for System Improvements (3)
- _____ I E 248 Engineering System Design, Manufacturing Processes & Specifications (3)
- _____ I E 271 Applied Ergonomics & Work Design (3)
- _____ I E 305 Engineering Economic Analysis (3)
- _____ I E 312 Optimization (3)
- _____ I E 341 Production Systems (3)
- _____ I E 348 Solidification Processes (3)
- _____ I E 361 Statistical Quality Assurance (3)
- _____ I E 413 Stochastic Modeling, Analysis & Simulation (4)
- _____ I E 441 Industrial Engineering Design (3)
- _____ I E 448 Manufacturing Systems Engineering (3)

6. Other Remaining Courses (26 cr.)

- _____ Mat E 273 Principles of Materials Sci & Engineering (3)
- _____ E M 274 Statics of Engineering (3)
- _____ M E 231 Thermodynamics (3)
- _____ E E 442 Introduction to Circuits and Instruments (2)
- _____ Engineering Topic Elective (6)
- _____ Focus Elective (6)
- _____ Management Elective (3)

7. Required Seminar

- _____ I E 101 Industrial Engineering Profession (R)

Last updated 8/18/16 (SSC)

Industrial Engineering

2016-2017 Catalog: Suggested Course Sequence

Degrees	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Semester 7	Semester 8
B.S. in IE 122 credits	MATH 165 Calc I 4 cr Placement Exam or Math 143	MATH 166 Calc II 4 cr C- or better in MATH 165	MATH 265 Calc III 4 cr C- or better in MATH 166 or MATH 166H	MATH 267 Diff Eq/Lap 4 cr C- or better in MATH 166 or MATH 166H	I E 305 Engr Econ Analysis 3 cr MATH 166	I E 348 Solidif Processes 3 cr IE 248 MAT E 273 <i>Spring Only</i>	I E 413 Stoch Modeling 4 cr Math 267 Stat 231 <i>Fall Only</i>	I E 441 IE Design 3 cr IE 248, IE 271, IE 361, Credit/Enrollment in IE 341, IE 413, IE 448
	Social Sciences and Humanities Elective 3 cr	PHYS 221 Classical Phys I 5 cr Credit/enrollment in MATH 166	I E 248 Intro Mfg Processes 3 cr MATH 166, PHYS 221, Credit/enrollment in IE 101, MAT E 273 <i>Fall Only</i>	STAT 231 Prob & Stat 4 cr Credit/enrollment in MATH 265	I E 341 Production Systems 3 cr STAT 231, Credit/enrollment in IE 312 <i>Fall Only</i>	I E 361 Quality Assurance 3 cr STAT 231	ENGL 314 Tech Comm 3 cr Junior Classification ENGL 250	I E 448 Manuf Sys Engr 3 cr IE 248 IE 305 <i>Spring Only</i>
	CHEM 167 Engr Chem 4 cr MATH 143 CHEM 50 or HS Equivalent	Social Sciences and Humanities Elective 3 cr	MAT E 273 Principles of Materials Science 3 cr Soph classification, CHEM 167 or 177, MATH 165	I E 271 Appl Ergonomics 3 cr PHYS 221 <i>Spring Only</i>	I E 312 Optimization 3 cr Credit/enrollment in MATH 267 <i>Fall Only</i>	Engineering Topic Elective 3 cr	M E 231 Engineering Thermodynamics I 3 cr MATH 166, CHEM 167, PHYS 221	Focus Elective 3 cr
	IE 148 Information Engr 3 cr Credit/enrollment in MATH 143	ENGL 150 Comp I 3 cr Credit/enrollment in LIB 160	PHYS 222 Classical Phys II 5 cr PHYS 221 MATH 166	I E 222 Design & Analysis Sys Improvements 3 cr IE 248, Credit/ enrollment in IE 271 <i>Spring Only</i>	E M 274 Statics 3 cr Credit/enrollment in MATH 166 PHYS 221	Social Sciences and Humanities Elective 3 cr	Focus Elective 3 cr	Management Elective 3 cr
	ENGR 101 Orientation R cr	LIB 160 Library 1 cr	ENGL 250 or ENGL 250H Comp II 3 cr C or better in ENGL 150 or placement, Credit/enrollment in LIB 160		SP CM 212 Fund of Public Speaking 3 cr	E E 442 Intro to Circuits 2 cr MATH 267 PHYS 222	Social Sciences and Humanities Elective 3 cr	Engineering Topic Elective 3 cr
		I E 101 IE Orient R cr						
122 Total Credits	14 cr	16 cr	18 cr	14 cr	15 cr	14 cr	16 cr	15 cr

Applicable prerequisites and co-requisites are listed under each course.

Note: Please verify all prerequisites and semester offerings with current course catalog

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Course Descriptions can be found at: <http://catalog.iastate.edu/azcourses/>

Light blue shading indicates Basic Program classes for all Engineering Majors; Dark blue indicates the IE core, course descriptions on the back of this page

7/26/2016 SSC

Course Requirements: 2017-2018 Catalog (Expires End of Summer 2023)

To graduate under the 2017 catalog, you are required to successfully complete 122 credits. The credits are distributed among seven areas. In the list below, please note that alternative courses are suggested in parentheses:

		<u>Credits</u>	<u>Area Total</u>
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	1. SP CM 212	3	
	2. ENGL 314	3	6
2.	Social Sciences and Humanities*		
	1. U.S. Diversity elective	3	
	2. International Perspective Elective	3	
	3. An additional 6 credits from approved departmental SSH List	6	12
	* At least 6 credits must be taken within the same department.		
	* At least 6 credits must be 200-level or higher.		
3.	Basic Program		
	1. CHEM 167	4	
	2. ENGL 150	3	
	3. ENGL 250	3	
	4. ENGR 101	R	
	5. I E 148	3	
	6. LIB 160	1	
	7. MATH 165	4	
	8. MATH 166	4	
	9. PHYS 221	5	27
4.	Math and Physical Science		
	1. MATH 265	4	
	2. MATH 247	4	
	3. STAT 231	4	
	4. PHYS 222	5	17
5.	Industrial Engineering Core		
	1. I E 222	3	
	2. I E 248	3	
	3. I E 271	3	
	4. I E 305	3	
	5. I E 312	3	
	6. I E 341	3	
	7. I E 348	3	
	8. I E 361	3	
	9. I E 413	4	
	10. I E 441	3	
	11. I E 448	3	34
		<u>Credits</u>	<u>Area Total</u>
6.	Other Remaining Courses		

	1. MAT E 273		3	
	2. E M 274		3	
	3. M E 231		3	
	4. E E 442		2	
	5. Focus Electives (choose from list)		6	
	6. Management Electives (choose from list)		3	
	7. Engineering Topic Elective (choose from list)		6	26
7.	Required Seminar			
	1. I E 101	R		R
				<hr/>
			TOTAL CREDITS	122

1. Communications (6 cr.)

- _____ SP CM 212 Fundamentals of Public Speaking (3)
- _____ ENGL 314 Technical Communication (3)

2. Social Science & Humanities (12 cr.)*

- _____ U.S. Diversity (3)
- _____ International Perspectives (3)
- _____ (3)
- _____ (3)

Note: Six credits in the SSH area must be 200-level or above, and six credits must form a sequence of prerequisite or related courses.

**See the list of courses approved by the IMSE Department.*

3. Basic Program (27 cr.)

- _____ CHEM 167 General Chemistry for Engineering Students (4)
or CHEM 177 General Chemistry and Chemistry Lab (4)
- _____ ENGL 150 Critical Thinking and Communication (3)
- _____ ENGL 250 Written, Oral, Visual, & Electronic Composition (3)
- _____ ENGR 101 Engineering Orientation (R)
- _____ I E 148 Information Engineering (3)
- _____ LIB 160 Information Literacy (1)
- _____ MATH 165 Calculus I (4)
- _____ MATH 166 Calculus II (4)
- _____ PHYS 221 Introduction to Classical Physics I (5)

4. Math and Physical Science (17 cr.)

- _____ MATH 265 Calculus III (4)
- _____ MATH 267 Elementary Differential Equations & Laplace
Transforms (4)
- _____ PHYS 222 Introduction to Classical Physics II (5)
- _____ STAT 231 Probability & Statistical Inference for Engr (4)

5. Industrial Engineering Core (34 cr.)

- _____ I E 222 Design & Analysis Methods for System
Improvements (3)
- _____ I E 248 Engineering System Design, Manufacturing
Processes & Specifications (3)
- _____ I E 271 Applied Ergonomics & Work Design (3)
- _____ I E 305 Engineering Economic Analysis (3)
- _____ I E 312 Optimization (3)
- _____ I E 341 Production Systems (3)
- _____ I E 348 Solidification Processes (3)
- _____ I E 361 Statistical Quality Assurance (3)
- _____ I E 413 Stochastic Modeling, Analysis & Simulation (4)
- _____ I E 441 Industrial Engineering Design (3)
- _____ I E 448 Manufacturing Systems Engineering (3)

6. Other Remaining Courses (26 cr.)

- _____ MAT E 273 Principles of Materials Sci & Engineering (3)
- _____ E M 274 Engineering Statics (3)
- _____ E E 442 Introduction to Circuits and Instruments (2)
- _____ M E 231 Engineering Thermodynamics (3)
- _____ Focus Electives (6)
- _____ Management Elective (3)
- _____ Engineering Topic Electives (6)

7. Required Seminar

- _____ I E 101 Industrial Engineering Profession (R)

Industrial Engineering

2017-2018 Catalog: Suggested Course Sequence

Degrees	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Semester 7	Semester 8
B.S. in IE 122 credits	MATH 165 Calc I 4 cr Placement Exam or Math 143	MATH 166 Calc II 4 cr C- or better in MATH 165	MATH 265 Calc III 4 cr C- or better in MATH 166 or MATH 166H	MATH 267 Diff Eq/Lap 4 cr C- or better in MATH 166 or MATH 166H	I E 305 Engr Econ Analysis 3 cr MATH 166	I E 348 Solidif Processes 3 cr IE 248 MAT E 273 <i>Spring Only</i>	I E 413 Stoch Modeling 4 cr Math 267 Stat 231 <i>Fall Only</i>	I E 441 IE Design 3 cr IE 248, IE 271, IE 361, Credit/Enrollment in IE 341, IE 413, IE 448
	Social Sciences and Humanities Elective 3 cr	PHYS 221 Classical Phys I 5 cr Credit/enrollment in MATH 166	I E 248 Intro Mfg Processes 3 cr MATH 166, PHYS 221, Credit/enrollment in IE 101, MAT E 273 <i>Fall Only</i>	STAT 231 Prob & Stat 4 cr Credit/enrollment in MATH 265	I E 341 Production Systems 3 cr STAT 231, Credit/enrollment in IE 312 <i>Fall Only</i>	I E 361 Quality Assurance 3 cr STAT 231	ENGL 314 Tech Comm 3 cr Junior Classification ENGL 250	I E 448 Manuf Sys Engr 3 cr IE 248 IE 305 <i>Spring Only</i>
	CHEM 167 Engr Chem 4 cr MATH 143 CHEM 50 or HS Equivalent	Social Sciences and Humanities Elective 3 cr	MAT E 273 Principles of Materials Science 3 cr Soph classification, CHEM 167 or 177, MATH 165	I E 271 Appl Ergonomics 3 cr PHYS 221 <i>Spring Only</i>	I E 312 Optimization 3 cr Credit/enrollment in MATH 267 <i>Fall Only</i>	Engineering Topic Elective 3 cr	M E 231 Engineering Thermodynamics I 3 cr MATH 166, CHEM 167, PHYS 221	Focus Elective 3 cr
	IE 148 Information Engr 3 cr Credit/enrollment in MATH 143	ENGL 150 Comp I 3 cr Credit/enrollment in LIB 160	PHYS 222 Classical Phys II 5 cr PHYS 221 MATH 166	I E 222 Design & Analysis Sys Improvements 3 cr IE 248, Credit/ enrollment in IE 271 <i>Spring Only</i>	E M 274 Statics 3 cr PHYS 221, Credit/enrollment in MATH 166	Social Sciences and Humanities Elective 3 cr	Focus Elective 3 cr	Management Elective 3 cr
	ENGR 101 Orientation R cr	LIB 160 Library 1 cr	ENGL 250 or ENGL 250H Comp II 3 cr C or better in ENGL 150 or placement, Credit/enrollment in LIB 160		SP CM 212 Fund of Public Speaking 3 cr	E E 442 Intro to Circuits 2 cr MATH 267 PHYS 222	Social Sciences and Humanities Elective 3 cr	Engineering Topic Elective 3 cr
		I E 101 I E Orient R cr						
122 Total Credits	14 cr	16 cr	18 cr	14 cr	15 cr	14 cr	16 cr	15 cr

Applicable prerequisites and co-requisites are listed under each course.

Note: Please verify all prerequisites and semester offerings with current course catalog

Elective List can be found on the IMSE website at <http://www.imse.iastate.edu/undergraduate-program/advising/>

Course Descriptions can be found at: <http://catalog.iastate.edu/azcourses/>

Light blue shading indicates Basic Program classes for all Engineering Majors; Dark blue indicates the IE core, course descriptions on the back of this page

Last Updated
5/23/17 HMR

Course Requirements: 2018-2019 Catalog (Expires End of Summer 2024)

To graduate under the 2018 catalog, you are required to successfully complete 122 credits. The credits are distributed among seven areas. In the list below, please note that alternative courses are suggested in parentheses:

	<u>Credits</u>	<u>Area Total</u>
1. Communications		
1. SP CM 212	3	
2. ENGL 314	3	6
2. Social Sciences and Humanities*		
1. U.S. Diversity elective	3	
2. International Perspective Elective	3	
3. An additional 6 credits from approved departmental SSH List	6	12
* At least 6 credits must be taken within the same department.		
* At least 6 credits must be 200-level or higher.		
3. Basic Program		
1. CHEM 167	4	
2. ENGL 150	3	
3. ENGL 250	3	
4. ENGR 101	R	
5. I E 148	3	
6. LIB 160	1	
7. MATH 165	4	
8. MATH 166	4	
9. PHYS 221	5	27
4. Math and Physical Science		
1. MATH 265	4	
2. MATH 247	4	
3. STAT 231	4	
4. PHYS 222	5	17
5. Industrial Engineering Core		
1. I E 222	3	
2. I E 248	3	
3. I E 271	3	
4. I E 305	3	
5. I E 312	3	
6. I E 341	3	
7. I E 348	3	
8. I E 361	3	
9. I E 413	4	
10. I E 441	3	
11. I E 448	3	34

		<u>Credits</u>	<u>Area Total</u>
6.	Other Remaining Courses		
	1. MAT E 273	3	
	2. E M 274	3	
	3. M E 231	3	
	4. E E 442	2	
	5. Focus Electives (choose from list)	6	
	6. Management Electives (choose from list)	3	
	7. Engineering Topic Elective (choose from list)	6	26
7.	Required Seminar		
	1. I E 101	R	R
	TOTAL CREDITS		<hr/> 122

1. Communications (6 cr.)

- _____ SP CM 212 Fundamentals of Public Speaking (3)
- _____ ENGL 314 Technical Communication (3)

2. Social Science & Humanities (12 cr.)*

- _____ U.S. Diversity (3)
- _____ International Perspectives (3)
- _____ (3)
- _____ (3)

Note: Six credits in the SSH area must be 200-level or above, and six credits must form a sequence of prerequisite or related courses.

**See the list of courses approved by the IMSE Department.*

3. Basic Program (27 cr.)

- _____ CHEM 167 General Chemistry for Engineering Students (4)
or CHEM 177 General Chemistry and Chemistry Lab (4)
- _____ ENGL 150 Critical Thinking and Communication (3)
- _____ ENGL 250 Written, Oral, Visual, & Electronic Composition (3)
- _____ ENGR 101 Engineering Orientation (R)
- _____ I E 148 Information Engineering (3)
- _____ LIB 160 Information Literacy (1)
- _____ MATH 165 Calculus I (4)
- _____ MATH 166 Calculus II (4)
- _____ PHYS 221 Introduction to Classical Physics I (5)

4. Math and Physical Science (17 cr.)

- _____ MATH 265 Calculus III (4)
- _____ MATH 267 Elementary Differential Equations & Laplace
Transforms (4)
- _____ PHYS 222 Introduction to Classical Physics II (5)
- _____ STAT 231 Probability & Statistical Inference for Engr (4)

5. Industrial Engineering Core (34 cr.)

- _____ I E 222 Design & Analysis Methods for System
Improvements (3)
- _____ I E 248 Engineering System Design, Manufacturing
Processes & Specifications (3)
- _____ I E 271 Applied Ergonomics & Work Design (3)
- _____ I E 305 Engineering Economic Analysis (3)
- _____ I E 312 Optimization (3)
- _____ I E 341 Production Systems (3)
- _____ I E 348 Solidification Processes (3)
- _____ I E 361 Statistical Quality Assurance (3)
- _____ I E 413 Stochastic Modeling, Analysis & Simulation (4)
- _____ I E 441 Industrial Engineering Design (3)
- _____ I E 448 Manufacturing Systems Engineering (3)

6. Other Remaining Courses (26 cr.)

- _____ MAT E 273 Principles of Materials Sci & Engineering (3)
- _____ E M 274 Engineering Statics (3)
- _____ E E 442 Introduction to Circuits and Instruments (2)
- _____ M E 231 Engineering Thermodynamics (3)
- _____ Focus Electives (6)
- _____ Management Elective (3)
- _____ Engineering Topic Electives (6)

7. Required Seminar

- _____ I E 101 Industrial Engineering Profession (R)

Industrial Engineering

2018-2019 Catalog: Suggested Course Sequence

Degrees	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Semester 7	Semester 8
B.S. in IE 122 credits	MATH 165 Calc I 4 cr Placement Exam or C- or better in Math 143	MATH 166 Calc II 4 cr C- or better in MATH 165	MATH 265 Calc III 4 cr C- or better in MATH 166 or MATH 166H	MATH 267 Diff Eq/Lap 4 cr C- or better in MATH 166 or MATH 166H	I E 305 Engr Econ Analysis 3 cr MATH 166	I E 348 Solidif Processes 3 cr IE 248 MAT E 273 <i>Spring Only</i>	I E 413 Stoch Modeling 4 cr Math 267 Stat 231 <i>Fall Only</i>	I E 441 IE Design 3 cr IE 248, IE 271, IE 361, Credit/Enrollment in IE 341, IE 413, IE 448
	Social Sciences and Humanities Elective 3 cr	PHYS 221 Classical Phys I 5 cr Credit/enrollment in MATH 166	I E 248 Intro Mfg Processes 3 cr MATH 166, PHYS 221, Credit/enrollment in IE 101, MAT E 273 <i>Fall Only</i>	STAT 231 Prob & Stat 4 cr Credit/enrollment in MATH 265 or MATH 265H	I E 312 Optimization 3 cr Credit/enrollment in MATH 267 <i>Fall Only</i>	I E 361 Quality Assurance 3 cr STAT 231	ENGL 314 Tech Comm 3 cr Junior Classification ENGL 250	I E 448 Manuf Sys Engr 3 cr IE 248 IE 305 <i>Spring Only</i>
	CHEM 167 Engr Chem 4 cr MATH 143 & CHEM 50 or HS Equivalent	Social Sciences and Humanities Elective 3 cr	MAT E 273 Principles of Materials Science 3 cr CHEM 167 or 177, MATH 165	I E 222 Design & Analysis Sys Improvements 3 cr IE 248, Credit/enrollment in IE 271 <i>Spring Only</i>	I E 341 Production Systems 3 cr STAT 231, Credit/enrollment in IE 312 <i>Fall Only</i>	Engineering Topic Elective 3 cr	M E 231 Engineering Thermodynamics I 3 cr MATH 166, CHEM 167, PHYS 221	Focus Elective 3 cr
	IE 148 Information Engr 3 cr Credit/enrollment in MATH 143	ENGL 150 Comp I 3 cr Credit/enrollment in LIB 160	PHYS 222 Classical Phys II 5 cr PHYS 221 MATH 166	I E 271 Appl Ergonomics 3 cr PHYS 221 <i>Spring Only</i>	E M 274 Statics 3 cr PHYS 221, Credit/enrollment in MATH 166	Social Sciences and Humanities Elective 3 cr	Focus Elective 3 cr	Management Elective 3 cr
	ENGR 101 Orientation R cr	LIB 160 Library 1 cr	ENGL 250 or ENGL 250H Comp II 3 cr C or better in ENGL 150 or placement, Credit/enrollment in LIB 160		SP CM 212 Fund of Public Speaking 3 cr	E E 442 Intro to Circuits 2 cr MATH 267 PHYS 222	Social Sciences and Humanities Elective 3 cr	Engineering Topic Elective 3 cr
		I E 101 I E Orient R cr						
122 Total Credits	14 cr	16 cr	18 cr	14 cr	15 cr	14 cr	16 cr	15 cr

Applicable prerequisites and co-requisites are listed under each course.

Note: Please verify all prerequisites and semester offerings with current course catalog

Elective List can be found on the IMSE website at <http://www.imse.iastate.edu/undergraduate-program/advising/>

Course Descriptions can be found at: <http://catalog.iastate.edu/azcourses/>

Light blue shading indicates Basic Program classes for all Engineering Majors; Dark blue indicates the IE core, course descriptions on the back of this page

Last Updated
5/21/18 HMR

Course Requirements: 2019-2020 Catalog (Expires End of Summer 2025)

To graduate under the 2019 catalog, you are required to successfully complete 122 credits. The credits are distributed among seven areas. In the list below, please note that alternative courses are suggested in parentheses:

	<u>Credits</u>	<u>Area Total</u>
1. Communications		
1. SP CM 212	3	
2. ENGL 314	3	6
2. Social Sciences and Humanities*		
1. U.S. Diversity elective	3	
2. International Perspective Elective	3	
3. An additional 6 credits from approved departmental SSH List	6	12
* At least 6 credits must be taken within the same department.		
* At least 6 credits must be 200-level or higher.		
3. Basic Program		
1. CHEM 167	4	
2. ENGL 150	3	
3. ENGL 250	3	
4. ENGR 101	R	
5. I E 148	3	
6. LIB 160	1	
7. MATH 165	4	
8. MATH 166	4	
9. PHYS 221	5	27
4. Math and Physical Science		
1. MATH 265	4	
2. MATH 247	4	
3. STAT 231	4	
4. PHYS 222	5	17
5. Industrial Engineering Core		
1. I E 222	3	
2. I E 248	3	
3. I E 271	3	
4. I E 305	3	
5. I E 312	3	
6. I E 341	3	
7. I E 348	3	
8. I E 361	3	
9. I E 413	4	
10. I E 441	3	
11. I E 448	3	34

		<u>Credits</u>	<u>Area Total</u>
6.	Other Remaining Courses		
	1. MAT E 273	3	
	2. E M 274	3	
	3. M E 231	3	
	4. E E 442	2	
	5. Focus Electives (choose from list)	6	
	6. Management Electives (choose from list)	3	
	7. Engineering Topic Elective (choose from list)	6	26
7.	Required Seminar		
	1. I E 101	R	R
	TOTAL CREDITS		<hr/> 122

1. Communications (6 cr.)

- _____ SP CM 212 Fundamentals of Public Speaking (3)
- _____ ENGL 314 Technical Communication (3)

2. Social Science & Humanities (12 cr.)*

- _____ U.S. Diversity (3)
- _____ International Perspectives (3)
- _____ (3)
- _____ (3)

Note: Six credits in the SSH area must be 200-level or above, and six credits must form a sequence of prerequisite or related courses.

**See the list of courses approved by the IMSE Department.*

3. Basic Program (27 cr.)

- _____ CHEM 167 General Chemistry for Engineering Students (4)
or CHEM 177 General Chemistry and Chemistry Lab (4)
- _____ ENGL 150 Critical Thinking and Communication (3)
- _____ ENGL 250 Written, Oral, Visual, & Electronic Composition (3)
- _____ ENGR 101 Engineering Orientation (R)
- _____ I E 148 Information Engineering (3)
- _____ LIB 160 Information Literacy (1)
- _____ MATH 165 Calculus I (4)
- _____ MATH 166 Calculus II (4)
- _____ PHYS 221 Introduction to Classical Physics I (5)

4. Math and Physical Science (17 cr.)

- _____ MATH 265 Calculus III (4)
- _____ MATH 267 Elementary Differential Equations & Laplace
Transforms (4)
- _____ PHYS 222 Introduction to Classical Physics II (5)
- _____ STAT 231 Probability & Statistical Inference for Engr (4)

5. Industrial Engineering Core (34 cr.)

- _____ I E 222 Design & Analysis Methods for System
Improvements (3)
- _____ I E 248 Engineering System Design, Manufacturing
Processes & Specifications (3)
- _____ I E 271 Applied Ergonomics & Work Design (3)
- _____ I E 305 Engineering Economic Analysis (3)
- _____ I E 312 Optimization (3)
- _____ I E 341 Production Systems (3)
- _____ I E 348 Solidification Processes (3)
- _____ I E 361 Statistical Quality Assurance (3)
- _____ I E 413 Stochastic Modeling, Analysis & Simulation (4)
- _____ I E 441 Industrial Engineering Design (3)
- _____ I E 448 Manufacturing Systems Engineering (3)

6. Other Remaining Courses (26 cr.)

- _____ MAT E 273 Principles of Materials Sci & Engineering (3)
- _____ E M 274 Engineering Statics (3)
- _____ E E 442 Introduction to Circuits and Instruments (2)
- _____ M E 231 Engineering Thermodynamics (3)
- _____ Focus Electives (6)
- _____ Management Elective (3)
- _____ Engineering Topic Electives (6)

7. Required Seminar

- _____ I E 101 Industrial Engineering Profession (R)

Degrees	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Semester 7	Semester 8
B.S. in IE 122 credits	MATH 165 Calc I 4 cr Placement Exam or C- or better in Math 143	MATH 166 Calc II 4 cr C- or better in MATH 165	MATH 265 Calc III 4 cr C- or better in MATH 166 or MATH 166H	MATH 267 Diff Eq/Lap 4 cr C- or better in MATH 166 or MATH 166H	I E 305 Engr Econ Analysis 3 cr MATH 166	I E 348 Solidif Processes 3 cr IE 248 MAT E 273 <i>Spring Only</i>	I E 413 Stoch Modeling 4 cr Math 267 Stat 231 <i>Fall Only</i>	I E 441 IE Design 3 cr IE 248, IE 271, IE 361, Credit/Enrollment in IE 341, IE 413, IE 448
	Social Sciences and Humanities Elective 3 cr	PHYS 221 Classical Phys I 5 cr Credit/enrollment in MATH 166	I E 248 Intro Mfg Processes 3 cr MATH 166, PHYS 221, Credit/enrollment in IE 101, MAT E 273 <i>Fall Only</i>	STAT 231 Prob & Stat 4 cr Credit/enrollment in MATH 265 or MATH 265H	I E 312 Optimization 3 cr Credit/enrollment in MATH 267 <i>Fall Only</i>	I E 361 Quality Assurance 3 cr STAT 231	ENGL 314 Tech Comm 3 cr Junior Classification ENGL 250	I E 448 Manuf Sys Engr 3 cr IE 248 IE 305 <i>Spring Only</i>
	CHEM 167 Engr Chem 4 cr MATH 143 & CHEM 50 or HS Equivalent	Social Sciences and Humanities Elective 3 cr	MAT E 273 Principles of Materials Science 3 cr CHEM 167 or 177, MATH 165	I E 222 Design & Analysis Sys Improvements 3 cr IE 248, Credit/enrollment in IE 271 <i>Spring Only</i>	I E 341 Production Systems 3 cr STAT 231, Credit/enrollment in IE 312 <i>Fall Only</i>	Engineering Topic Elective 3 cr	M E 231 Engineering Thermodynamics I 3 cr MATH 166, CHEM 167, PHYS 221	Focus Elective 3 cr
	IE 148 Information Engr 3 cr Credit/enrollment in MATH 143	ENGL 150 Comp I 3 cr Credit/enrollment in LIB 160	PHYS 222 Classical Phys II 5 cr PHYS 221 MATH 166	I E 271 Appl Ergonomics 3 cr PHYS 221 <i>Spring Only</i>	E M 274 Statics 3 cr PHYS 221, Credit/enrollment in MATH 166	Social Sciences and Humanities Elective 3 cr	Focus Elective 3 cr	Management Elective 3 cr
	ENGR 101 Orientation R cr	LIB 160 Library 1 cr	ENGL 250 or ENGL 250H Comp II 3 cr C or better in ENGL 150 or placement, Credit/enrollment in LIB 160		SP CM 212 Fund of Public Speaking 3 cr	E E 442 Intro to Circuits 2 cr MATH 267 PHYS 222	Social Sciences and Humanities Elective 3 cr	Engineering Topic Elective 3 cr
		I E 101 I E Orient R cr						
122 Total Credits	14 cr	16 cr	18 cr	14 cr	15 cr	14 cr	16 cr	15 cr

Course Requirements: 2020-2021 Catalog (Expires End of Summer 2026)

To graduate under the 2020 catalog, you are required to successfully complete 122 credits. The credits are distributed among seven areas. In the list below, please note that alternative courses are suggested in parentheses:

	<u>Credits</u>	<u>Area Total</u>
1. Communications		
1. SP CM 212	3	
2. ENGL 250	3	
3. ENGL 314	3	9
2. Social Sciences and Humanities*		
1. U.S. Diversity elective	3	
2. International Perspective Elective	3	
3. An additional 6 credits from approved departmental SSH List	6	12
* At least 6 credits must be taken within the same department.		
* At least 6 credits must be 200-level or higher.		
3. Basic Program		
1. CHEM 167	4	
2. ENGL 150	3	
3. ENGR 101	R	
4. I E 148	3	
5. LIB 160	1	
6. MATH 165	4	
7. MATH 166	4	
8. PHYS 221	5	24
4. Math and Physical Science		
1. MATH 265	4	
2. MATH 247	4	
3. STAT 231	4	
4. PHYS 232/232L	5	17
5. Industrial Engineering Core		
1. I E 222	3	
2. I E 248	3	
3. I E 271	3	
4. I E 305	3	
5. I E 312	3	
6. I E 341	3	
7. I E 348	3	
8. I E 361	3	
9. I E 413	4	
10. I E 441	3	
11. I E 448	3	34

Bachelor of Science in Industrial Engineering

2020-2021 Catalog

Total Credits Required =122

1. Communications (9 cr.)

- _____ SP CM 212 Fundamentals of Public Speaking (3)
- _____ ENGL 250 Written, Oral, Visual, & Electronic Composition (3)
- _____ ENGL 314 Technical Communication (3)

2. Social Science & Humanities (12 cr.)*

- _____ U.S. Diversity (3)
- _____ International Perspectives (3)
- _____ (3)
- _____ (3)

Note: Six credits in the SSH area must be 200-level or above, and six credits must form a sequence of prerequisite or related courses.

**See the list of courses approved by the IMSE Department.*

3. Basic Program (24 cr.)

- _____ CHEM 167 General Chemistry for Engineering Students (4)
or CHEM 177 General Chemistry and Chemistry Lab (4)
- _____ ENGL 150 Critical Thinking and Communication (3)
- _____ ENGR 101 Engineering Orientation (R)
- _____ I E 148 Information Engineering (3)
- _____ LIB 160 Information Literacy (1)
- _____ MATH 165 Calculus I (4)
- _____ MATH 166 Calculus II (4)
- _____ PHYS 221 Introduction to Classical Physics I (5)

4. Math and Physical Science (17 cr.)

- _____ MATH 265 Calculus III (4)
- _____ MATH 267 Elementary Differential Equations & Laplace Transforms (4)
- _____ PHYS 232/232L Introduction to Classical Physics II (5)
- _____ STAT 231 Probability & Statistical Inference for Engr (4)

5. Industrial Engineering Core (34 cr.)

- _____ I E 222 Design & Analysis Methods for System Improvements (3)
- _____ I E 248 Engineering System Design, Manufacturing Processes & Specifications (3)
- _____ I E 271 Applied Ergonomics & Work Design (3)
- _____ I E 305 Engineering Economic Analysis (3)
- _____ I E 312 Optimization (3)
- _____ I E 341 Production Systems (3)
- _____ I E 348 Solidification Processes (3)
- _____ I E 361 Statistical Quality Assurance (3)
- _____ I E 413 Stochastic Modeling, Analysis & Simulation (4)
- _____ I E 441 Industrial Engineering Design (3)
- _____ I E 448 Manufacturing Systems Engineering (3)

6. Other Remaining Courses (26 cr.)

- _____ MAT E 273 Principles of Materials Sci & Engineering (3)
- _____ C E 274 Engineering Statics (3)
- _____ E E 442 Introduction to Circuits and Instruments (2)
- _____ M E 231 Engineering Thermodynamics (3)
- _____ Focus Electives (6)
- _____ Management Elective (3)
- _____ Engineering Topic Electives (6)

7. Required Seminar

- _____ I E 101 Industrial Engineering Profession (R)

Industrial Engineering

2020-2021 Catalog: Suggested Course Sequence

Degrees	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Semester 7	Semester 8
B.S. in IE 122 credits	MATH 165 Calc I 4 cr Placement Exam or C- or better in Math 143	MATH 166 Calc II 4 cr C- or better in MATH 165	MATH 265 Calc III 4 cr C- or better in MATH 166 or MATH 166H	MATH 267 Diff Eq/Lap 4 cr C- or better in MATH 166 or MATH 166H	I E 305 Engr Econ Analysis 3 cr MATH 166	I E 348 Solidif Processes 3 cr IE 248 MAT E 273 <i>Spring Only</i>	I E 413 Stoch Modeling 4 cr Math 265 Stat 231 <i>Fall Only</i>	I E 441 IE Design 3 cr IE 248, IE 271, IE 361, Credit/Enrollment in IE 341, IE 413, IE 448
	Social Sciences and Humanities Elective 3 cr	PHYS 221 Classical Phys I 5 cr Credit/enrollment in MATH 166	I E 248 Intro Mfg Processes 3 cr MATH 166, PHYS 221, Credit/enrollment in IE 101, MAT E 273 <i>Fall Only</i>	STAT 231 Prob & Stat 4 cr Credit/enrollment in MATH 265 or MATH 265H	I E 312 Optimization 3 cr Credit/enrollment in MATH 267 <i>Fall Only</i>	I E 361 Quality Assurance 3 cr STAT 231	ENGL 314 Tech Comm 3 cr Junior Classification ENGL 250	I E 448 Manuf Sys Engr 3 cr IE 248 IE 305 <i>Spring Only</i>
	CHEM 167 Engr Chem 4 cr MATH 140 & CHEM 50 or HS Equivalent	Social Sciences and Humanities Elective 3 cr	MAT E 273 Principles of Materials Science 3 cr CHEM 167 or 177, MATH 165	I E 222 Design & Analysis Sys Improvements 3 cr IE 248, Credit/ enrollment in IE 271 <i>Spring Only</i>	I E 341 Production Systems 3 cr STAT 231, Credit/enrollment in IE 312 <i>Fall Only</i>	Engineering Topic Elective 3 cr	M E 231 Engineering Thermodynamics I 3 cr MATH 166, CHEM 167, PHYS 221	Focus Elective 3 cr
	IE 148 Information Engr 3 cr Credit/enrollment in MATH 143	ENGL 150 Comp I 3 cr Credit/enrollment in LIB 160	PHYS 232X & PHYS 232 L Classical Phys II 5 cr PHYS 221 MATH 166	I E 271 Appl Ergonomics 3 cr PHYS 221 <i>Spring Only</i>	C E 274 Statics 3 cr PHYS 221, Credit/enrollment in MATH 166	Social Sciences and Humanities Elective 3 cr	Focus Elective 3 cr	Management Elective 3 cr
	ENGR 101 Orientation R cr	LIB 160 Library 1 cr	ENGL 250 or ENGL 250H Comp II 3 cr C or better in ENGL 150 or placement, Credit/enrollment in LIB 160		SP CM 212 Fund of Public Speaking 3 cr	E E 442 Intro to Circuits 2 cr MATH 267 PHYS 222 or PHYS 232X & Lab	Social Sciences and Humanities Elective 3 cr	Engineering Topic Elective 3 cr
		I E 101 I E Orient R cr						
122 Total Credits	14 cr	16 cr	18 cr	14 cr	15 cr	14 cr	16 cr	15 cr

Applicable prerequisites and co-requisites are listed under each course.

Note: Please verify all prerequisites and semester offerings with current course catalog

Elective List can be found on the IMSE website at <http://www.imse.iastate.edu/undergraduate-program/advising/>

Course Descriptions can be found at: <http://catalog.iastate.edu/azcourses/>

Light blue shading indicates Basic Program classes for all Engineering Majors; Dark blue indicates the IE core, course descriptions on the back of this page

Last Updated
7/23/20 HMR

IMSE Required Course Offerings by Semester

Fall Semester Only

I E 248

I E 312

I E 341

I E 413

Spring Semester Only

I E 222

I E 271

I E 348

I E 448

Both Semesters

I E 148

I E 305

I E 361

I E 441

Part 3: Electives

The IMSE curriculum provides students with the opportunity to obtain a greater depth of knowledge through several different elective areas: Management, Focus, Engineering Topic, and Social Sciences and Humanities.

Students who entered ISU in or after Fall '14 must select two courses from each of the Focus and Engineering Topic elective lists and one from the Management elective list. Students must also choose four Social Sciences and Humanities electives.

The current elective list can be found on the IMSE Academic Advising & Student Services webpage under 'Important Information' at: <https://www.imse.iastate.edu/advising-and-student-services/>

Management Electives

Students who entered ISU in or after Fall '14 will choose one course (3 credits total) from the Management elective list.

Focus Electives

Students will choose two classes (6 credits total) from the five focus areas: Systems Engineering and Engineering Management, Human Factors, Operations Research and Analytics, Manufacturing, & Enterprise Computing.

- Systems Engineering and Engineering Management - focuses on the strategies necessary for solving internal and external problems of a company in areas such as production, quality, project management, sales, and marketing strategies.
- Human Factors - focuses on with the relationships between people and their work tasks, machines, information, environment, engineering as well as technology.
- Operations Research and Analytics - focuses on the design and analysis of quantitative models and methods having applications in production and service systems such as inventory control, scheduling, transportation, and logistics.
- Manufacturing - focuses on the design, analysis, operation, and control of manufacturing processes and systems.
- Enterprise Computing - focuses on the integration of information within the functional units of an enterprise as well as among multiple enterprises.

Engineering Topic Electives

Students will choose two classes (6 credits total) from the Engineering Topic elective list.

Social Sciences and Humanities Electives

The Industrial Engineering program has created a list of Social Science and Humanities (SSH) courses for students to choose from to meet the 12 credits required for graduation. Six credits in the SSH area must be 200-level or above, and six credits must form a sequence of prerequisite or related courses. This list contains numerous US Diversity and International Perspectives courses: students must have 3 credits in each for graduation as a part of the 12 credit SSH requirement. Please check these courses with your adviser prior to completing the course.

Part 4: Preparing Your Academic Plan

Step 1 – Review Important Resources

Maintain these important resources while you are a student at Iowa State. They are especially helpful when registering for classes but also are excellent references whenever you have a question and want to find the answer yourself. The online versions are kept up-to-date and thus have more current information than the paper versions.

- *Orientation Notebook*

The red notebook you received at orientation is full of useful information on university policies, procedures, resources, jargon, history, and customs, plus some community information as well. This document can also be found online at: <https://www.admissions.iastate.edu/orientation/after/handbook.php>

New Student Programs (515) 294-5492
2630 Memorial Union nsp@iastate.edu

- *Industrial and Manufacturing Systems Engineering Undergraduate Handbook*

The IMSE Handbook contains information about your degree requirements, policies and procedures, and the resources available through the IMSE Department, the College of Engineering, and the university.

Available online at: <http://www.imse.iastate.edu/undergraduate-program/advising/>

- *Undergraduate and Graduate Courses and Programs*

The catalog outlines your degree program. It also summarizes course content and prerequisites and co-requisites for courses. Information regarding a variety of policies and procedures is included.

Iowa State University Catalog; available online at: <http://catalog.iastate.edu/>

Office of the Registrar (515) 294-1840
214 Enrollment Services Center registrar@iastate.edu

- *Schedule of Classes*

The Schedule of Classes provides a list of all current course offerings for the upcoming semester. Also included are an academic calendar, registration instructions, current fees, and other practical information. This document is published each semester and is currently available only in its on-line version.

Available online at: <http://classes.iastate.edu/>

Office of the Registrar (515) 294-1840
214 Enrollment Services Center registrar@iastate.edu

- *Student Life Policies*

These are the policies and procedures that all ISU students are expected to know, understand, and follow while at Iowa State University. They include policies about student conduct, academics, and residence hall policies.

Available online at: <http://www.policy.iastate.edu/policy/student-life>.

Dean of Students Office (515) 294-1020
1010 Student Services Building dsoweb@iastate.edu

Step 2 – Understand the Student/Adviser Relationship

In the relationship between a student and an academic adviser, each party has certain responsibilities.

The Adviser's Role

Your academic adviser in IMSE makes students the top priority and works as a student advocate. The adviser's role is to assist you in reaching your goal of acquiring an education and eventually a degree. While **it is ultimately your responsibility to make sure you are meeting all graduation requirements**, frequent contact with your adviser will help you in this process.

Your adviser listens to your concerns and questions. Often the adviser will explain policies and procedures or, if there are options, give you objective and practical advice to help you decide on a course of action.

1. If you have questions or are experiencing academic problems, please don't wait for your adviser to contact you. Call, email, or schedule an appointment in AccessPlus with ISUAppointments right away. Instructions can be found here: <http://www.imse.iastate.edu/undergraduate-program/advising/schedule-an-appointment/>

The Student's Role

It is your responsibility to know about all the policies and procedures that apply to you as a student. You are expected to consult with your adviser frequently and come prepared to your advising appointments. Above all, ignore rumors and avoid advice from other students – get accurate information from your adviser instead.

Here are some suggestions of what you can do to stay on top of your academic situation:

- Keep informed about all important dates and deadlines, such as the last day to drop a course, start dates for registration, and the deadline for paying fees.
- Each semester, review your degree audit and immediately resolve any questions you have about it.
- Plan your program of study, i.e., which semesters you will take the required courses, electives, study abroad experience (if you choose one), and co-op/intern experience (if you choose one).
- Know which catalog you are on and which degree requirements you must meet.
- Review the graduation requirements specific to Industrial Engineering, and make sure that your program of study satisfies all of them.

Caution: Your lack of awareness concerning the policies, procedures, and expectations of the College of Engineering and the university can result in a delayed graduation. Please be diligent in checking your Degree Audit on AccessPlus and reviewing this handbook to ensure you are making satisfactory degree progress.

Step 3 – Select a Catalog

A student may choose to graduate under the catalog in effect at the time of graduation or a catalog for the previous five years, provided it covers a period of his or her enrollment. Full requirements of the chosen catalog must be met except

that adjustments will be made in instances where courses are no longer available or where programs have been changed.

Step 4 – Develop a Plan

As early as possible, develop an academic plan, semester by semester, through graduation. The plan includes all the courses required to receive a degree and should follow a similar format to the “Suggested Course Sequence Guide” for your catalog.

You can use the [“IMSE Required Course Offerings by Semester”](#) to check the terms in which the courses are usually offered so that you can more easily fit them into your graduation plan.

Step 5 – Determine Your Electives

Your degree program contains a certain number of credits designated as electives. This means that you have a choice among courses within a given subject matter designation. Courses for elective credit may be chosen from the approved lists on the [Academic Advising & Students Services webpage](#): Management, Focus Areas, Engineering Topic, and Social Sciences and Humanities. It is your responsibility to check on the prerequisites for the courses you are interested in, making sure you are eligible and prepared to take them. Also, check the terms in which the courses are usually offered so that you can more easily fit them into your graduation plan.

Step 6 – Choose a Focus Area

The IMSE Department offers five focus areas: systems engineering and engineering management, manufacturing, operations research and analytics, human factors, and enterprise computing. You also have the option (“general”) which is a mixture of courses from any of the five areas.

Tips for the Planning Process

As you work on your academic plan, consider the following issues:

- Be aware that many IE courses have accompanying labs, and the number of credits awarded for a course may not reflect the amount of time you are actually in class.
- Strike a balance between the so-called "light" and "heavy" courses. Deferring all "heavy" courses to your senior year is a strategy that could backfire.
- Know when management and focus electives are offered and whether you have the prerequisites for them.
- Decide whether you will participate in a co-op or internship program so you can plan when to take the courses you might miss on campus that semester.
- Decide whether you will study abroad so that you and your adviser can plan what courses you will take at the other institution and how they will affect the rest of your plan.
- If you have a very low GPA, consider taking lighter course loads (no more than 12 credits) until you can build up your average.
- Few IE courses are offered during summer sessions, so it would be better not to rely on summer classes as you plan your program. If you want to take a class in the summer, check the course schedule for that term and consult with your adviser.
- Consider repeating a course and using “designated repeat credits” to your advantage. You are allowed to repeat up to 15 credits where the most current grade is used in your cumulative GPA instead of the previous grade. Talk with your adviser about judiciously using designated repeats.
- Co-op/internship participation, course drops, and repeats often require additional semesters.

INDUSTRIAL ENGINEERING GRADUATION PLAN

Name: _____ Entry Date: _____ Catalog: _____ Academic Adviser: _____

PLEASE READ ALL INSTRUCTIONS BEFORE BEGINNING:

1. You may choose to fill the form out in pencil or by using the electronic form in Microsoft Word.
2. Complete the entire heading (name, entry date, catalog, and adviser). Requirements vary by catalog so this is important!
3. Fill out the Elective List on the right by using the IE Elective List at: <https://www.imse.iastate.edu/files/2020/08/Elective-List-20-21-v.2.pdf>
4. Complete your graduation plan using the IE Suggested Course Sequence, IE Elective List, Degree Audit, and Catalog.
5. Check to make sure:
 - All transfer and AP courses have been included. Transfer courses must have a grade of 'C' or higher to transfer to ISU.
 - Courses are offered in the semester that you schedule them. (Example: IE 248 in the Fall semester.)
 - Courses are scheduled in the correct order. All course prerequisites must be satisfied.
 - Credit loads each semester are ≤ 18 credits and are at a manageable level of difficulty (4 or less problem solving).
 - All curriculum requirements for graduation are satisfied.

AP/Transfer Credit	Credits	Fall	Credits	Spring	Credits	Elective List
Course		Course		Course		US Diversity
						Int'l Perspective
						Social Sciences & Humanities
						6 cr. Sequential or related
Total Credits		Total Credits		Total Credits		
Summer		Fall		Spring		6 cr. 200+ level
Course	Credits	Course	Credits	Course	Credits	
						Management Elective
						Focus Electives
Total Credits		Total Credits		Total Credits		
Summer		Fall		Spring		Engineering Topic Electives
Course	Credits	Course	Credits	Course	Credits	
						Select If Interested
						<input type="checkbox"/> Study Abroad
						Location:
Total Credits		Total Credits		Total Credits		<input type="checkbox"/> Concurrent Program
Summer		Fall		Spring		<input type="checkbox"/> Masters in Business Admin
Course	Credits	Course	Credits	Course	Credits	<input type="checkbox"/> MS Industrial Engineering
						Adviser Notes:
Total Credits		Total Credits		Total Credits		
Summer		Fall		Spring		
Course	Credits	Course	Credits	Course	Credits	
Total Credits		Total Credits		Total Credits		

Total Credits		Total Credits		Total Credits		

Part 5: Registering for Classes

Degree Audits

Students are able to view their individualized degree audit through AccessPlus at any time during the semester. The degree audit is an essential tool to have when developing your academic plan. Students are allowed to run 10 degree audits per day.

Because of periodic changes in offerings, the courses you have taken may not conform exactly to those required on your degree audit. If there are differences, ask your adviser to fill out a form called Degree Audit Exceptions Form, requesting that the college office make minor adjustments to your degree audit.

YOU are ultimately responsible for your academic plan. It would be devastating to find out in your last semester that you do not have enough credits in the right areas to graduate. **Therefore, you must monitor your degree audit carefully.** Each semester, make sure that the credits you have taken and the credits remaining to be taken add up to the subtotal on the degree audit and that courses appear in the correct areas.

The degree audit is divided into the following seven areas of study:

1. International Perspectives
2. U. S. Diversity
3. Communication Proficiency and Remaining Communication Courses
4. Foreign Language
5. Social Sciences and Humanities
6. Basic Program
 - 6A. Other General Engineering Courses
 - 6B. Focus Electives
 - 6C. Management Electives
 - 6D. Engineering Topic Electives
10. Required Seminar
11. Courses Not Applied to Degree Program

DARS (Degree Audit Reporting System)

Beginning in Fall 2007 the College of Engineering changed the degree audit system to DARS (Degree Audit Reporting System). The degree audit system produces individualized reports that reflect a student's academic progress toward a specified degree. It will compare the student's course work, both here and transfer work, with the requirements of the Industrial Engineering academic degree program and prepares a report, or audit, which details the student's progress toward meeting those requirements.

What's on a degree audit?

- Courses you've completed, with the grade and term taken
- Courses you're currently enrolled in (CUR) or registered for in future terms (REG)
- Courses and requirements not yet completed
- Updates to other important information (number of drops, probation status, etc.)

Includes minors, double majors, & honors

What does a DARS audit look like?

Divided into categories:

- Student information
- University requirements
- College requirements
- Department requirements
- "Courses Not Applied"
- Common sections
- "Legend" & disclaimer

Terms to Remember

Requirement

- OK
- NO
- IN-PROGRESS

Sub-requirement (subgroup)

- + means Completed
- - means Incomplete

Use the Legend to decipher other markings.

Messages Examples:

- Your application for graduation has been received
- 2.00 ISU cum GPA required for Basic Program completion
- Engl 150/250 min grade C, Minimum GPA 2.0
- 2.00 Industrial Engineering Core GPA

Check your degree audits carefully every semester

ALWAYS CONSULT YOUR ADVISER!

Registration Procedure

Here's what to do:

2. Go into AccessPlus; review your registration start date and time. It will be listed under Student Information.
3. Check your degree audit in AccessPlus.

4. Make an advising appointment with your Academic Adviser in AccessPlus with ISUAppointments. Instructions can be found here: <http://www.imse.iastate.edu/undergraduate-program/advising/schedule-an-appointment/>
5. Make sure that you have completed a Graduation Plan. There **must** be one on file to receive your RAN#.
6. Check out the registration information on the IMSE web site: <http://www.imse.iastate.edu/undergraduate-program/advising/>
7. Once you have your RAN, you will register yourself through AccessPlus on your start date.

Certain groups of students need to meet with the academic adviser due to special circumstances, namely,

1. New students in the department (new freshmen, transfers, major changes)
2. Students on academic warning or probation
3. Graduating seniors
4. Students planning co-ops or internships
5. Students planning to study abroad

Part 6: Policies & Procedures

Academic Dishonesty

The faculty of the IMSE Department will not tolerate unethical and dishonest practices in the classroom or laboratory. Students in violation of this policy will be treated according to Iowa State University policies on academic dishonesty. (<https://www.studentconduct.dso.iastate.edu/academic-misconduct/armstu>)

Auditing a Course

Auditing means you are enrolling in a course without receiving a grade or credit for that course. An audit counts for credit in terms of ISU billing, but it does not count towards maintaining full-time status. This option generally should be used only to take a course for which you have some interest, but that has no impact on your degree plan, or you are totally unfamiliar with the subject area and want a “trial run.”

Audits do not count towards your degree program, and the course can be taken again for credit. Audited courses do not appear on your permanent record, unless you make a special request through your academic adviser and can demonstrate active participation in the course. Audits do give you the same rights and privileges of any other student taking the course.

Audits cannot be added through [AccessPlus](#): You must have the instructor’s signature on an Add/Drop Slip. Audits must be declared within the first 10 days of class.

If you change a class from credit to audit, you are officially dropping the class and adding it as an audit. This means you will use one of your drops if you change to an audit after the first week of the semester.

Calculating Your GPA

1. Multiply the number of credits by the numerical value of the grade you earned to determine quality points. For example, PHYS 221 is a 5-credit course. If you earned a B+ in PHYS 221, you would acquire (5 x 3.33) 16.67 quality points (QP).
2. Add in the numerical value of grades (See ‘Basic Program Requirements’ in this handbook).
3. Sum all quality points.
4. Sum all credits.

5. Divide total quality points by total credits to get your term GPA.

Students are also encouraged to use the GPA Calculator here: <https://www.registrar.iastate.edu/students/grades/gpa-calc>

Curriculum/Major Changes

Before making a change of curriculum or major, please take the time to investigate your proposed area of study by visiting with an adviser in the department of interest or with other students currently enrolled in that curriculum.

A curriculum change implies that you are staying within the College of Engineering but are selecting a different discipline. For example, if you are presently an I E student and want to change your curriculum to Chemical Engineering (CH E), you would go through the sequence of steps outlined below.

1. Begin with your current adviser in Industrial Engineering. The IE adviser provides you with a File Transmittal form and your advising file.
2. Proceed to your new departmental office. In this example, that would be the main office of the Department of Chemical Engineering. Your advising file stays in the new departmental office, and you are assigned a new adviser.

If you are leaving the College of Engineering for a department in another college, then you are making a major change. In that case, there is an additional steps between steps 1 and 2:

- 1A. Proceed with the File Transmittal form and advising file to the Engineering Classification office in 1300 Marston Hall. The Classification office records the change on your permanent file.
- 1B. After leaving the College of Engineering Classification office, proceed to the Student Services office in your new college. Usually someone in the Engineering Classification office tells you the location of that office.

If you are on Academic Probation and want to change to another college, you must first receive permission from the college and department you wish to enter. If you proceed with the change and at a later time decide that you would like to transfer back to the College of Engineering, you must receive permission from the College of Engineering Academic Standards Committee.

Designated Repeats

You may repeat classes to improve your grades, up to a limit of 15 credits. The most recent grade and credits will be used in computing your cumulative GPA, but all grades will remain on your record. You may NOT repeat a course under Pass/Not Pass.

If more than three semesters of enrollment have elapsed since you first took the course or if the course number of credits has changed, you must fill out the Designated Repeat form available from your adviser.

Drops – Maximum Number

Whenever you think about dropping a course, carefully weigh the consequences. Dropping a single course can significantly change the remainder of your academic plan.

If you enter Iowa State as a freshman, the maximum number of courses that may be dropped after the first week of classes is five. Course drops during your first semester as a freshman are not included in this limit, and summer session is not counted as a first semester. Transfer students entering at the sophomore level or above are allowed four drops.

Students who have already earned a bachelor's degree are allowed two drops. Note: Courses changed to "audit" status during a semester count as drops.

English Proficiency

The department requires a C grade (2.0) or better in both ENGL 150 and 250.

Independent Study (I E 490)

Students who are in good standing may earn credit under a 490 number by studying independently under the direction of an IMSE professor. Credits taken under the 490 number must have an Independent Study Proposal form approved before you register for the course. This proposal must carry the signed approval of the faculty member under whom the work will be done, your adviser, and the IMSE Department Chair. After the proposal is approved, a copy will be returned to you and another will be filed with the adviser.

A maximum of three credits of I E 490 may be counted toward the degree, although you may request more if you can demonstrate extenuating circumstances (see your adviser about this process). I E 490 courses are usually graded as Satisfactory/Fail.

Minimum GPAs

A minimum GPA of 2.00 must be earned for both the Basic Program and the Iowa State cumulative GPA before you are eligible to take 200-level (or higher) engineering courses.

To graduate, you need a 2.00 grade point average in Industrial Engineering core courses and a cumulative GPA of at least 2.00.

Minors

If you are interested in studying another area of interest, you might consider declaring a minor in that area. In the College of Engineering, the minors available are Biomedical engineering, Energy Systems, Engineering Sales, Nondestructive Evaluation, and Nuclear Engineering. However, engineering students may also take minors in other departments that offer minors.

A minor consists of at least 15 credits. Nine credits must be used only in the minor, but the remaining credits may be counted toward requirements in both the minor and the major, if possible.

Check with the minor department and the Catalog about specific requirements for obtaining the minor.

Pass/Not Pass

Pass/Not Pass (not to be confused with Satisfactory/Fail) means you are enrolled in a course for credit, but are being graded on a Pass/Not Pass basis instead of a normal letter grade. Pass/Not Pass counts as credit for both ISU billing and for maintaining full-time status. This option should be used only to take a course for which you have some interest, but do not intend on using for your degree program.

There are many rules governing taking courses on a Pass/Not-Pass basis, but most students can decide whether or not to consider this option by asking two questions:

- Do I want to apply this course to my degree program?
- Is this class required for my major? Once you have taken a course Pass/Not Pass, you can never retake it for credit. This means you can't take any required courses on a Pass/Not Pass basis.

If you answered no to both of those questions, then you should consult with your academic adviser about taking a course Pass/Not Pass. Courses can be changed to Pass/Not Pass basis until the drop deadline (see the [ISU Academic Calendar](#)), and you need only your academic adviser's signature.

Your instructor will not know you are taking the course Pass/Not Pass; they will still consider you a student taking the course for credit.

Once final grades are submitted, the registrar's office will change your letter grade to P or NP. A D- or higher grade is required to receive a P.

Pass/Not Pass courses do appear on your permanent record.

Schedule Changes

The procedure for adding or dropping courses depends on when you want to make the change. Basically, there are four stages where the deadlines, signature requirements, and fee vary:

Before the first day of classes

Use AccessPlus to add or drop a class. These changes are not shown on your permanent record. If you want to cancel your registration completely, you must do so before classes begin. Otherwise, you are assessed tuition and fees, which accumulate until you notify the Registrar's Office about the cancellation.

Period 1 (during the first five days of the semester)

Use AccessPlus to add or drop a class. The schedule changes you make during the first five days of classes do not count against your permanent record. In general, no additional signatures are needed. However, if a class is closed or if permission is required to add the class, you will need the instructor's signature on an add/drop slip, which you will take to 10 Enrollment Services Center.

Period 2 (after the fifth day of classes)

Follow this procedure:

1. Pick up an add/drop slip from your adviser.
2. Take the slip to the instructor of the class you wish to add or drop, and have the instructor approve the change with a signature.
3. Have your adviser approve the change with a signature on the add/drop slip.
4. Finally, take the slip to 10 Enrollment Services Center. (Due to COVID-19, this policy may change. Please check with your academic adviser for final steps.)

Changes made after the fifth day of classes count against your permanent record. During your first term at Iowa State as a freshman, drops processed after the first week of classes are shown on your permanent record but are not deducted from the total number of drops allowed. (See Drops– Maximum number.)

Period 3 (after the drop deadline)

The last day to drop a class will always be noted in the Academic Calendar. After the drop deadline has passed, a drop or add will not be approved except for unusual circumstances beyond the student's control. Such changes MUST be

supported by the adviser and approved by the Engineering Student Services Office, 1300 Marston Hall. In some cases, review by the College of Engineering Academic Standards Committee may be required.

Social Sciences & Humanities Electives

The IMSE Department has the following requirements for Social Sciences and Humanities (SSH) electives:

- You must complete 12 credits of SSH electives.
- You must include at least six credits (two courses) that are 200-level or above.
- You must include at least one six-credit sequence. A sequence is defined as at least two courses (usually three credits each) from the same or related discipline. Typically, a sequence consists of one course which is a prerequisite for the second.
- The list of approved SSH classes is included in this handbook. Please check these courses with your adviser prior to completing the course.
- You must include one International Perspectives course, and it must be selected from the university list of approved International Perspective courses*.
- You must include one U.S. Diversity course, and it must be selected from the university list of approved U.S. Diversity courses*.
- The International Perspectives and U.S. Diversity lists may be viewed on-line at:
<http://www.registrar.iastate.edu/students/div-ip-guide>

*Ideally, IE students will choose International Perspectives and U.S. Diversity courses from the approved IE SS/H list.

Substitutions to the Curriculum

On occasion, you may wish to deviate from the prescribed curriculum. Some flexibility may be allowed, particularly if you can demonstrate extenuating circumstances. All substitutions must be petitioned through the IMSE Curriculum, Assessment, and Standards Committee, (CASCOM; the curriculum committee). The role of the committee is to review substitutions to the prescribed curriculum in terms of university policies and ABET requirements. It is advisable to receive approval for your proposed change before taking a course outside the usual parameters. Talk to your adviser about this process.

Academic Probation Policy

Students are placed on academic probation status as a warning that their academic progress is not satisfactory and that they should take steps to improve their academic performance to avoid dismissal from the university.

Students who are placed on academic probation should immediately seek assistance in academic improvement from such sources as academic advisers, instructors, the Student Counseling Service, and the Academic Success Center. Additionally, students on academic probation and warning are required to meet with their adviser and to complete the Academic Intervention Self-Assessment form, which can be accessed through Access Plus. For more information, see <http://www.dso.iastate.edu/asc/ai/students/>.

Academic Warning, Probation, and Dismissal

Continued enrollment at Iowa State University depends upon an undergraduate student maintaining satisfactory academic progress toward attaining a degree. To assist students in maintaining satisfactory progress, Iowa State University has adopted academic standards designed to provide early identification of students who are experiencing academic difficulty, and to provide timely intervention through academic advising and academic support programs.

Academic standing at Iowa State University is dependent upon the total number of credits a student has attempted or earned, the student's semester grade point average (GPA), the student's cumulative ISU GPA, and the student's transfer GPA (if below 2.00.)

Academic Warning

While a warning (W) is the least severe of the negative academic actions, it serves as a reminder that future academic performance below 2.00 could result in more serious consequences. In fact, a student on warning whose subsequent term GPA is below a 2.00 will be placed on probation (P) the following term.

Students who receive an academic warning are required to develop a plan for academic improvement in consultation with their academic adviser or the Academic Success Center. A student who is subject to both academic warning and academic probation will be placed on academic probation. The academic warning is not a part of the student's permanent academic record.

Students will receive an academic warning (W) at the end of any fall or spring semester when they earn a GPA of 1.00 – 1.99 for that semester. At the end of the next fall or spring semester of enrollment, one of the following actions will be taken for students on academic warning status:

- Students will be placed on academic probation if they earn less than a 2.00 GPA for the next fall or spring semester, or
- They will be removed from warning status if they earn at least a 2.00 semester GPA for the next fall or spring semester and they are not subject to academic probation based on cumulative GPA (over 75 credits).

See Summer Academic Standards Regulations section for how summer grades affect warning, probation, or dismissal status.

Academic Probation

Academic probation is an indication of very serious academic difficulty which may result in dismissal from the university. Students may be placed on academic probation as a result of either semester GPA, cumulative GPA, or both.

Students who are placed on academic probation are required to develop a plan for academic improvement in consultation with their academic adviser which may include referral to the Academic Success Center. Academic probation status is not a part of the student's permanent academic record.

Students will be placed on academic probation (P) at the end of a semester/term for either of the following two reasons:

1. Semester GPA: Students who earn less than a 1.00 at the end of any fall or spring semester, or less than a 2.00 two consecutive semesters, will be placed on academic probation. Students will not be placed on academic probation at the end of the summer term due to summer term GPA only.
2. Cumulative GPA: Students with 75 or more credits attempted or earned, whichever is greater, will be placed on academic probation at the end of any fall or spring semester or summer term when their cumulative GPA is less than 2.00. Students with 75 or more credits attempted or earned who have a transfer GPA < 2.00 will be placed on academic probation at the end of any fall or spring semester or summer term when their combined transfer/ISU cumulative GPA is less than 2.00.

At the end of the next fall or spring semester of enrollment, one of the following actions will be taken for students on academic probation status:

- Students will be academically dismissed if they fail to earn at least a 2.00 semester GPA. At the end of any spring semester, students in dismissal status may enroll for summer term. (See Summer Option for Students in Dismissal Status in the Summer Academic Standards Regulations section.)
- Students will continue on academic probation if they earn at least a 2.00 semester GPA but are subject to continued academic probation based on their cumulative GPA (over 75 credits).
- Students will be removed from probation if they earn at least a 2.00 semester GPA and are not subject to continued academic probation based on their cumulative GPA (over 75 credits).

See Summer Academic Standards Regulations section for how summer grades affect warning, probation, or dismissal status.

Academic Dismissal

Students who do not meet the requirements of their academic probation are academically dismissed from the university. Each College Academic Standards Committee is responsible for final decisions regarding the academic status of students in that college, and any appeals to academic dismissal actions are considered by the college committee. Once dismissed, students are not allowed to reenroll at Iowa State University until they have been academically reinstated. (See section on reinstatement.) Academic dismissal is placed on the student's academic record as a permanent notation. The official transcript of a student who has been dismissed includes a "not in good standing" notation.

Summer Academic Standards Regulations

Students who are newly placed or continued on academic probation (P) at the end of the previous semester may enroll for the summer term without being in jeopardy of academic dismissal from the university at the end of that summer term.

Summer Combined Term GPA:

All students who attend summer session will have their academic status reassessed at the end of the summer based on the combined (not averaged) grade summaries of their previous term of attendance and summer term. Academic status (warning or probation) after summer session will be based on the resulting combined term GPA. The academic status resulting from the summer combined term GPA supersedes the academic status at the end of the previous term.

For students who have remaining designated repeat credits, courses taken in the previous semester and repeated in summer will be calculated as designated repeats in the combined term GPA.

The combined term GPA (summer plus preceding term) will not appear on the student's grade report or permanent record.

Summer term GPA alone cannot determine academic status. Students who initiate enrollment at Iowa State during the summer will not be placed on warning or probation regardless of their academic performance.

Summer Cumulative GPA:

A student who was on academic probation (P) at the beginning of summer term based only on cumulative GPA, who raises his or her cumulative GPA to over a 2.0 at the end of the summer term shall be removed from probation status at the end of the summer term.

A student with 75 or more credits attempted or earned, whichever is greater, will be placed on academic probation (P) at the end of the summer term if his or her cumulative GPA is less than 2.00.

A student with 75 or more credits attempted or earned who has a transfer GPA < 2.00 will be placed on academic probation (P) at the end of any summer term if his or her combined transfer/ISU cumulative GPA is less than 2.00.

Summer Option for Students in Dismissal Status:

Starting with the 2019-20 University Catalog, Summer Option will no longer be an option for students in dismissal status.

Reinstatement

The procedures delineated in this section apply to students who were dismissed from Iowa State for academic reasons. Students who left Iowa State in good academic standing and who are seeking reentry should see Index, Reentry for more information.

1. Reinstatement is not automatic. Students who have been dismissed for academic reasons should contact the dean's office in the college they wish to enter for instructions specific to that college. The college Academic Standards Committee reviews each petition and other relevant information, and reinstatement is based upon that review. As part of the petition process, students must submit a plan for academic success that identifies the causes of their poor academic performance and demonstrates that they have taken actions to avoid or eliminate these causes.
2. Students can only be reinstated after at least one academic semester has elapsed since they were academically dismissed. The summer session is not a semester for the purpose of being out of school one semester.
3. Students who have been dismissed from enrollment two or more times are not eligible for reinstatement until at least two academic semesters have elapsed since their last academic dismissal.
4. Students who were dismissed by one college and subsequently reinstated by another college cannot transfer back to the original college unless permission is granted by the Academic Standards Committee of the original college. This procedure applies regardless of the student's academic standing when the transfer is requested.
5. To be considered for reinstatement to the university, students must submit a petition to the Academic Standards Committee of the college in which they desire to enroll at least 45 days before the beginning of the semester. Students who have not been enrolled for a period of 12 or more months or who are international students must also file a reentry form prior to their return. For more information see the Reentry web site at <http://www.registrar.iastate.edu/info/reentry.html>. (Students dismissed for the second time and requesting reinstatement in the College of Liberal Arts and Sciences must submit their petition 70 days before the beginning of the semester.)
6. As a condition of reinstatement, students will reenter on academic probation and must accept whatever additional requirements are stipulated by the college Academic Standards Committee. Examples include full- or part-time status, specified credit hours, specific courses, specific GPAs, restriction on choice of major, and required counseling.

For more information on academic probation, academic dismissal, and reinstatement procedures, refer to the catalog. For reinstatement forms and information regarding deadlines, contact your adviser or the Engineering Undergraduate Programs Office in 1300 Marston Hall. (<http://www.engineering.iastate.edu/student-services/academic-standards/>)

Transfer Credits

If you have been admitted to Iowa State University from another institution or have taken classes at another school during the summer, it is likely that you have transfer credits. To have those credits become part of your academic record at Iowa State, ask the Registrar's Office at the other institution to send an official transcript to Iowa State. Make sure that you have the other school send your transcripts to Iowa State so that your classes can be evaluated in a timely manner. Credit cannot be awarded until a final grade from the other institution is submitted.

Prior Approval

Before taking a course for transfer credit, you will need to have the course evaluated by using TRANSIT: <https://transit.iastate.edu/>.

It is your responsibility to make sure the course you want to take can be designated as an acceptable substitute for a specific course at Iowa State. Likewise, it is your responsibility to ensure that any off-campus courses can be applied to your IE degree. See your adviser for help.

Transfer Credit Evaluation

When you have transfer credits from another institution, you receive a copy of the Transfer Credit Evaluation from the Office of Admissions. The Transfer Credit Evaluation lists how the courses you have taken at other schools transfer to Iowa State. It also lists the titles for each course, their respective credits, and the grade you earned in each one.

Courses will appear with first a department code, then the a number that stands for the course level, next the letter T for transfer, followed by the number of courses (i.e., Engr 1T22) are courses for which there is no direct equivalent at Iowa State. If you think a course sounds similar to one at Iowa State, you can request an evaluation by the appropriate department. You will need a course description from the catalog, a syllabus, and a Request for Department Review of a Transfer Course. To begin this process, see your adviser.

Policies

See your adviser about applying transferred credits toward your degree requirements. When requesting that transferred credits be applied to your degree, remember these policies:

1. Transfer credit with a grade less than a C will not be approved for application to the program. The only exception are grades from international institutions that only grade satisfactory/fail.
2. Courses taken at other institutions may transfer even if they are offered for fewer credits than the comparable course at Iowa State. However, each such course must be listed by the Registrar's Office as an acceptable course for the specific requirement. For example, Physics 150 taken at Purdue for four credits might be acceptable if Iowa State considers that course to be equivalent to Physics 221 for five credits. In that case, though, additional course work (in the same content area) would be required to make up the credit shortage before you graduate. In the case of credit deficiency in mathematics and basic sciences, appropriate engineering credits may be used to make up for the credit shortage. The total number of engineering credits used for such cases is limited to 2.
3. No more than 65 semester or 97 quarter credits earned at two-year colleges can be applied to a bachelor's degree from Iowa State University. While there is no limit to the number of credits that may be transferred from a four-year institution, the last 32 semester credits before receiving a degree from Iowa State University must be completed at Iowa State University.

4. In order to graduate, you must have earned at least 32 credits in residence at Iowa State University, and your final 32 credits must be taken at Iowa State. However, 6 of the last 32 credits may be transferred to Iowa State, with prior written permission of the IMSE Department. See your adviser regarding this written permission.
5. A transcript of your transfer work must be received by Iowa State by midterm of the term you plan to graduate.

Note: It has been IMSE Department policy, for a transfer student, to accept Stat 305 already taken as Stat 231 provided that the 1 credit deficiency is appropriately addressed.

Meeting Degree Requirements

When there is doubt as to whether transfer credit applies to the required curriculum, you may file a petition with the IMSE Curriculum, Assessment, and Standards Committee (CASCOMM). See your adviser to begin this process by submitting a Curriculum Adjustment Request.

Transferred courses that are not applied towards your degree appear in the "Courses Not Applied" section at the bottom of your degree audit, along with any other non-applicable courses that you have completed. If you think that a transferred course should be applied to your degree but has not been, contact your adviser.

Validation of Enrollment

Your enrollment in a class must be validated by attendance at one of the first two class meetings following registration in the course. If enrollment is not validated, you may be asked to drop the course, and you must process the drop yourself. If you decide not to attend a course, it is your responsibility to get appropriate signatures on an add/drop slip. If you do not, you could earn a grade of "F" because the instructor will not automatically drop you from the class.

Part 7: Work Experiences

Co-ops, Internships, & Summer Work

Engineering-related work experience gives you the unique opportunity of earning money while gaining valuable engineering experience. These programs allow you to apply what is learned in the classroom directly to industry. Upon returning from a work experience, you will find yourself better able to do the following:

- Understand your course work.
- See how engineering courses relate to the job.
- Determine if Industrial Engineering is the right major for you.
- Motivate yourself for better academic performance.
- Find permanent employment upon graduation.

For these reasons, a work experience during college is highly recommended, even though it is not required.

Here are definitions of three types of work experiences:

- Co-op – A twelve-month (minimum total) program in which you alternate between working on site and studying at Iowa State. Students are not allowed to be at a work site for twelve consecutive months. In general, students work for one semester, return to Iowa State for the next semester, and finish their co-op the following semester and the adjacent summer.
- Internship* – A work experience for one semester.
- Summer* – A work experience for the summer only.

* Students often combine the internship and summer work experience for a continuous work experience of seven to eight months.

For these types of work experience, you are still considered a full-time student at Iowa State but are not assessed tuition and fees while you are away. This allows you to maintain most of the benefits of being enrolled in college (such as parental health insurance coverage and deferred loan repayment). You maintain your full-time status by filling out paperwork with Engineering Career Services and meeting with your adviser to discuss registration for the appropriate IE course. These are R-credit courses that are graded on a Satisfactory/Fail basis and do not affect your tuition.

Please note there is a mandatory evaluation process at the end of the co-op and internship experiences.

Engineering Career Services

Refer to the ECS website <https://www.engineering.iastate.edu/ecs/> for information regarding ISU CyHire, preparing resumes, interviewing for positions, letter writing, assessing and negotiating job offers and other items relating to career opportunities.

Engineering Career Services
3200 Marston Hall

(515) 294-2540
ecs@iastate.edu

Part 8: Graduation Information

General Requirements

The semester before graduation is the time to resolve problems involving graduation requirements. After you have registered for classes for your final term, check your degree audit for accuracy and resolve any outstanding degree requirements with your adviser.

An application for graduation should be submitted before the deadlines indicated below in AccessPlus (student tab, graduation, application). Details on this process can be found here:

<https://www.graduation.iastate.edu/bachelors/application-for-graduation>

- Spring (May) – Friday before Thanksgiving break
- Summer (August): Friday before spring break
- Fall (December): Last business day of July

Please note: these dates may change due to COVID-19. Please contact the [Office of the Registrar](#) for final details.

The Graduation Office notifies you via email the second week of classes the term you plan to graduate reviewing important graduation deadlines. You will be notified of your graduation status by email by mid-semester of the term you plan to graduate. Your graduation status can also be viewed in AccessPlus by selecting student tab, graduation, graduation status.

The graduation application is not an application to participate in the commencement ceremony.

Your diploma is mailed to you two or three weeks after graduation. Details can be found here:

<https://www.graduation.iastate.edu/university-commencement/diplomas>

Questions regarding graduation can be sent to the Graduation Office at 210 Enrollment Services Center, phone 515-294-1840 or email graduation@iastate.edu.

32-Credit Rules

Iowa State University requires that all undergraduates earn at least 32 credits in residence, and your final 32 credits need to be taken in residence. However, 6 of the last 32 credits may be transferred to Iowa State, with prior written permission from the IMSE Department. Your transcript needs to be received at Iowa State by midterm of your graduation term.

If you are close to graduation and plan to take any course work at another institution, see your adviser before enrolling there.

Graduation Checklist

During the semester before you graduate, make sure that you are on track by using this checklist.

OBJECTIVE	Yes	No
The graduation date on my degree audit is accurate. <i>(If not, see your adviser.)</i>		
I have registered for all the courses I need during the term I am graduating.		
My degree audit is accurate, and I have sufficient credits in each area to insure graduation. <i>(If not, see your adviser immediately.)</i>		
My cumulative GPA at Iowa State is at least 2.00. <i>(If you entered with a quality point deficiency, you must have earned sufficient quality points above a 2.00 to offset the deficiency.)</i>		
I have resolved any grades of "I" (incomplete) before midterm of the semester I plan to graduate.		
I have submitted all transcripts of courses taken at other institutions to the Office of Admissions.		
My final 32 credits have been taken at Iowa State. <i>(If not, see your adviser immediately.)</i>		
I submitted my graduation application in AccessPlus before the deadline <i>(see General Requirements above)</i> .		
I have resolved all outstanding financial aid obligations <i>(e.g., parking tickets, library fines, tuition, and fees)</i> .		

Part 9: More Resources

Academic Services

Iowa State students are eligible to receive a number of services sponsored by the Dean of Students Office (DSO) or the College of Engineering. Services offered by the DSO are designed to help you make the most of your time while earning your degree at Iowa State University. For academic assistance, tutoring, counseling, or information about the services offered by the DSO, you are encouraged to visit the DSO in 1010 Student Services Building or online at:

<http://www.dso.iastate.edu/>. Contact information: (515)294-1020, dsoweb@iastate.edu.

LEAD Program

The Leadership through Engineering Academic Diversity (LEAD) Program is committed to improving the educational experience and academic success, retention, and graduation of minority engineering students at Iowa State University. Services available to minority students through the LEAD Program include tutoring, peer mentoring, and engineering learning communities. For more information about the LEAD Program, contact the LEAD Program Coordinator in 1300 Marston Hall. Website: <http://www.engineering.iastate.edu/lead/>

Computer Help

The following is a list of resource offices and websites that will help you find answers to your questions about technology at Iowa State.

- IMSE Department contact: Mike Renze, IT System Support Specialist, mdrenze@iastate.edu
- College of Engineering Technology Support: <http://it.engineering.iastate.edu/>
- IT for Students: <http://www.it.iastate.edu/foryou/students/>
- University Book Store: <http://www.isubookstore.com/home.aspx>
- Tech CYte: <http://www.techcyte.isubookstore.com/home.aspx>

Honors Program

The University Honors Program at Iowa State (<http://www.honors.iastate.edu/>) promotes an enriched academic environment for students of high ability, regardless of major, who are interested in taking advantage of educational and intellectual opportunities and challenges. These include the pursuit of a broad liberal education, the ability to individualize the student's program of study, access to graduate-level courses, and the opportunity to be involved in research projects.

University Honors Program
2130 Jischke Honors Building

(515) 294-4371
honors@iastate.edu

The academic advisers in IE will advise IE Honors Program members on their requirements.

IDEAL Learning Community

Learning communities provide an opportunity for students to improve their interactive, problem solving, and study skills. In addition to taking a cluster of courses together, students enjoy other academic, service, and social activities that enrich their learning. Participating students benefit from peer, faculty, and alumni mentoring.

For freshmen and transfer students who are majoring in Industrial Engineering, the learning community is called InDustrial Engineers Are Leaders (IDEAL).

For more information, contact Heather Robinson at (515) 294-7797.

Scholarships

Many students qualify for scholarships from ISU. Each year the College of Engineering awards about \$1,400,000 in scholarships to engineering students. The generous support of hundreds of individuals and corporations allows us to recognize the academic accomplishments of outstanding, hard-working students.

If you have questions, contact:

Scholarships and Awards Committee (515) 294-8355
Engineering Undergraduate Programs engineeringscholarships@iastate.edu
1300 Marston Hall

Student Organizations

A good way to feel connected on campus is to join a student organization. At Iowa State, there are hundreds to choose from across campus as well as those within the IMSE Department and the College of Engineering.

IMSE Department

Your department has several of student organizations that you can become involved with. For more information, contact your academic adviser.

- AITM (Alpha Pi Mu) <https://www.stuorg.iastate.edu/site/alphapimu>
- IISE (Institute of Industrial & Systems Engineers) <https://www.stuorg.iastate.edu/site/iise>
- INFORMS (Institute for Operations Research and Management Science)
 - Contact Dr. Jo Min jomin@iastate.edu

College of Engineering

The College of Engineering sponsors many student organizations: <https://www.stuorg.iastate.edu/orgtype/6>

Iowa State University

For a complete listing of all campus student clubs and organizations: <https://www.sac.iastate.edu/student-organizations/>

Study/Work Abroad Opportunities

Studying abroad provides opportunities for students to challenge themselves academically, intellectually, and emotionally. You have the chance to go virtually anywhere in the world. Visit the Study Abroad Center, 3224 Memorial Union or on-line at <http://www.studyabroad.iastate.edu/>.

The College of Engineering has an additional resource for students who want to study in countries where programs have been established specifically for engineering students. Contact the Engineering International Programs office, 1300 Marston Hall, or online at: <http://www.engineering.iastate.edu/studyabroad/>.

Once you select an institution abroad, consult with your adviser about how courses will transfer back to Iowa State and therefore what courses are appropriate to take.

For opportunities to work abroad, please contact the Engineering International Programs office in 1300 Marston Hall or Engineering Career Services, 3200 Marston Hall.

Part 10: Where To Find Us

Contact Information

<u>Name</u>	<u>Office</u>	<u>Phone</u>	<u>Email</u>
Dr. Gül Kremer Department Chair	3004 Black	294-6668	gkremer@iastate.edu
Dr. Jo Min Director of Undergraduate Studies and Co-op Education	3030 Black	294-8095	jomin@iastate.edu
Dr. Gary Mirka Director of Graduate Studies	3025 Black	294-8661	mirka@iastate.edu
Dr. Michael Helwig Director of Graduate Studies, Systems Engineering and Engineering Management	3032 Black	294-4789	mhelwig@iastate.edu
Devna Popejoy-Sheriff Student Success and Services Program Coordinator	3038 Black	294-1603	devna@iastate.edu

IMSE Faculty

<u>Name</u>	<u>Office/Email</u>	<u>Phone</u>
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Dr. Matt Frank	3023 Black Engineering	294-0389

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Dr. Richard Stone	3027 Black Engineering rstone@iastate.edu	294-3644
Dr. Stephen Vardeman	3022 Black Engineering vardeman@iastate.edu	294-9068
Dr. Lizhi Wang	3016 Black Engineering lzwang@iastate.edu	294-1757

IMSE Staff

<u>Name</u>	<u>Office</u>	<u>Phone</u>	<u>E-mail</u>
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Nick Fetty Communications Specialist	3004 Black Engineering	294-5065	nrfetty@iastate.edu
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Deborah McDonough Graduate Student Services Specialist	3011 Black Engineering	294-0129	deborahm@iastate.edu
Rhaechel Ohge Fritz Academic Adviser	3034 Black Engineering	294-1683	reofritz@iastate.edu

Devna Popejoy-Sheriff Student Success and Services Program Coordinator	3038 Black Engineering	294-1603	devna@iastate.edu
Mike Renze IT Systems Support Specialist	3031 Black Engineering	232-7405	mdrenze@iastate.edu

TA Offices

Teacher Assistant offices can be found in 0010 Black Engineering.

IMSE Laboratory Facilities

Laboratories Commonly Used by Undergraduates

- Industrial Design Laboratory (0016 Black Engineering Building)
- e-Learning Facility (0028 Black Engineering Building)
- Multi Use Space – (0006 Black Engineering Building)
- Industrial Automation Laboratory
- Learning Community Space
- Computer Lab

Manufacturing Laboratories (Shared with Mechanical Engineering)

- Metrology Laboratory (0036 Black Engineering)
- CNC Machining Laboratory (1076 Black Engineering)
- Machining Laboratory (1070 Black Engineering)
- Computer Aided Manufacturing Computing Lab (1072 Black Engineering)
- Welding Laboratory (1092 Black Engineering)
- Metalcasting Laboratory (1098 Black Engineering)
- Polymer Processing Laboratory (1070 and 1092 Black Engineering)
- Materials Testing Laboratory (1070 and 1092 Black Engineering)
- Research and Education Support Facility (1051 Black Engineering)

Research Laboratories and Graduate Student Offices

- The Physical Ergonomics and Biomechanics Lab (0049 Black Engineering)
- The ATHENA Lab (0066 Black Engineering)
- Adaptive Cognitive Systems Laboratory (0068 Black Engineering)
- Operations Research and Production Systems Research Group Space (0074 and 0022 Black Engineering)
- Rapid Manufacturing and Prototyping Lab (1117 Black Engineering)
- Wind Energy Manufacturing Laboratory (1117 Black Engineering)
- Flexible Electronics and Additive Printing Laboratory (1117B Black)
- Teaching Assistant Office (0010 Black Engineering)

Centers with IMSE Faculty Affiliation

- Center for e-Design (2624 Howe Hall)
- Virtual Reality Applications Center (Howe Hall)

- Center for Non Destructive Evaluation (ASC Building)

Appendix

1. The Industrial Engineering Program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>
2. Further information on the program is available at <http://www.imse.iastate.edu/undergraduate-program/>
3. The Program Educational Objectives and Student Outcomes are available at <https://www.imse.iastate.edu/accreditation/>