

## Bachelor of Science (BS)

# Industrial & Systems Engineering

Industrial & Systems Engineers design, analyze, and control complex systems, such as manufacturing systems, global supply chain, and service systems. Different from other engineering disciplines that apply skills to the specific areas, Industrial Engineering is the only engineering discipline that focuses on optimizing systems for maximum efficiency, minimum cost, quality improvement, safety, and other interests to the stakeholders of the system. It saves time, money, materials, energy, and other resources for the companies, industries, and essentially for our society. The skills of Industrial & Systems Engineers can be applied in an extremely wide range of organizations.

The Industrial & Systems Engineering program has a strong base of math and the physical sciences, fundamental engineering courses, and more specific courses on industrial management, manufacturing, and industrial engineering. A goal of the program is to get student to understand and then optimize the products, processes, tools, and technologies used in industry and other complex system. Many industrial & systems engineering jobs in this region will be in manufacturing and related industries. However, the skills can also be applied in municipalities, transportation and logistics, healthcare, and many other fields that use complex systems.

### Industrial & Systems Engineering students will...

- Understand the fundamental concepts required to be a professional in the field, including concepts in mathematics, physical sciences, and engineering.
- Obtain a more specialized knowledge in industrial management, manufacturing, and engineering analysis than can be applied to industrial and other complex systems.
- Have the ability to design or optimize complex systems given economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability constraints to meet the needs of society.
- Have experience using the techniques, skills, and tools necessary for modern careers in the field of industrial & systems engineering.

### Career Planning

Career preparation is part of the mission of Southeast. 100% of programs offer our students an internship, study-abroad program, clinical opportunity, student teaching or research internship.

The Office of Career Services in Academic Hall 057 can provide students with professional career counseling and coaching, resume critiques, practice interviews, job search strategies, career events, networking opportunities, and more.

Demonstrated Career Proficiency is a Requirement of all Southeast Students		
CL001	First Semester	Students connect academic career planning by completing an online career assessment
CL002	Second Semester	Students learn more about resources available to enhance academic and career planning
CL003	Junior Year	Students learn about continued career planning, job search strategies, and networking
CL004	Senior Year	Students learn about resume development, professional communication, interviewing, and transitioning to the first job from college

### Career Opportunities

- Industrial engineer
- Systems engineer
- Manufacturing engineer
- Quality engineer
- Product/process engineer
- Plant engineer
- Engineering analyst

**To learn more**  
Office of Admissions  
(573) 651-2590  
admissions@semo.edu  
www.semo.edu

**To explore the College**  
of Science, Technology and  
Agriculture online, visit  
www.semo.edu/costa

**For advising**  
Center for Academic Advising - North  
(573) 651-5090  
www.semo.edu/advising  
advisingnorth@semo.edu

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# Degree Map 2017-2018

This is a guide based on the 2017-2018 Undergraduate Bulletin and is subject to change. The time it takes to earn a degree will vary based on several factors such as dual enrollment, remediation, and summer enrollment. Students will meet with an academic advisor each semester and use DegreeWorks to monitor their individual progress.

### CURRICULUM CHECKLIST

#### INDUSTRIAL & SYSTEMS ENGINEERING 82-83 Hour Major – No minor required

##### Required Courses:

- \_\_\_ EG201 Systems Engineering (1)
- \_\_\_ EG492 Modeling & Simulation (3)
- \_\_\_ EG5xx Operations Research (3)
- \_\_\_ EP100 Physics & Engineering Concepts (1)
- \_\_\_ EP240 Circuit Analysis (4)
- \_\_\_ EP261 Engineering Mechanics Statics (3)
- \_\_\_ EP361 Thermal Analysis (3)
- \_\_\_ ET304 Fundamentals of Programmable Logic Controllers (3)
- \_\_\_ IM301 Industrial Safety Supervision (3)
- \_\_\_ IM313 Facilities Planning (3)
- \_\_\_ IM315 Work Measurement (3)
- \_\_\_ IM411 Total Quality Assurance (3)
- \_\_\_ IM417 Manufacturing Resources Analysis (3)
- \_\_\_ MA140 Analytic Geometry and Calculus I (5)
- \_\_\_ MA145 Analytic Geometry and Calculus II (4)
- \_\_\_ MA240 Analytic Geometry and Calculus III (3)
- \_\_\_ MA345 Linear Algebra (3)
- \_\_\_ MA523 Probability & Statistics I (3)
- \_\_\_ MN120 Fundamentals of Engineering Design Process (3)
- \_\_\_ MN170 Engineering Materials & Testing (3)
- \_\_\_ MN203 Engineering Materials & Processes I (3)
- \_\_\_ MN324 Mechanical Design Processes (3)
- \_\_\_ MN412 Advanced Manufacturing Systems (3)
- \_\_\_ PH230 General Physics I (5)
- \_\_\_ PH231 General Physics II (5)
- \_\_\_ UI410 Manufacturing Research in a Global Society (3)

##### Choose one course:

- \_\_\_ MN260 Technical Computer Programming Applications (3)
- \_\_\_ CS155 Computer Science I (4)
- \_\_\_ CS177 Programming for Scientists & Engineers (3)

##### Additional requirements:

- \_\_\_ CH185 General Chemistry (5)
- \_\_\_ MN220 Engineering Economic Analysis (3)
- \_\_\_ SW207 Understanding Cultural & Social Diversity (3)
- \_\_\_ UI400 Business & Ethics (3)

##### University Studies Requirements (not already listed above):

UI100 First Year Seminar, EN100 English Composition, Artistic Expression, Written Expression, Oral Expression, Literary Expression, Behavioral Systems, Living Systems, Development of a Major Civilization, Political Systems

If you have dual credit or transfer credit, please visit our transfer course equivalencies guide at [semo.edu/transfercredit](http://semo.edu/transfercredit).

### SAMPLE FOUR-YEAR PLAN

	Fall Semester		Spring Semester	
	Course #	Hrs	Course #	Hrs
<b>FIRST YEAR</b>	UI100	3	EG201	1
	EP100	1	MA145	4
	MA140	5	MN170	3
	MN120	3	MN260/CS155/CS177	3-4
	MN220	3	PH230	5
	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>16-17</b>
Milestone: maintain 2.0 cumulative GPA				
<b>SECOND YEAR</b>	IM301	3	CH185	5
	IM315	3	EN100	3
	MA240	3	EP240	4
	MA345	3	EP261	3
	PH231	5	MA523	3
	<b>Total</b>	<b>17</b>	<b>Total</b>	<b>18</b>
Milestone: maintain 2.0 cumulative GPA				
<b>THIRD YEAR</b>	EP361	3	EG492	3
	IM313	3	ET304	3
	IM411	3	IM417	3
	MN203	3	MN324	3
	SW207	3	Artistic Expression	3
			Behavioral Systems	3
<b>Total</b>	<b>15</b>	<b>Total</b>	<b>18</b>	
Milestone: maintain 2.0 cumulative GPA				
<b>FOURTH YEAR</b>	EG5xx	3	MN412	3
	UI400	3	UI410	3
	Develop of a Major Civ	3	Living Expression	3
	Literary Expression	3	Oral Expression	3
	Written Expression	3	Political Systems	3
	<b>Total</b>	<b>15</b>	<b>Total</b>	<b>15</b>
Milestone: maintain 2.0 cumulative GPA				

**Degree requirements for all students:** a minimum of 120 credit hours, completion of University Studies program, completion of 39 senior division hours (300-599), career proficiencies (CL001-004), Writing Proficiency Exam (WP003), and completion of the Measure of Academic Proficiency and Progress (MAPP) at the senior level. Refer to the Undergraduate Bulletin or Degree Works for additional graduation requirements for your program.

A minimum 2.00GPA in the major and overall are required to graduate with a BS degree.

Revised  
3/31/2017

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