Physics is perhaps the most fundamental of the sciences. It involves the study of the nature of basic things, such as motion, forces, energy, matter, heat, sound, light, and the atom. Physics reduces our knowledge of the world around us to a more orderly and satisfying form. It is successfully applied to solving problems of practical importance to society. Modern technology depends heavily upon physics, and technological progress follows advances in physics and the other basic sciences. The interest of physicists extends from the vast world of stars and galaxies to the minute world of atoms and elementary particles. Physicists did the pioneering work in the discovery and development of electrical and nuclear power, communication systems, solid state devices and integrated circuits, computers, jet propulsion, and interplanetary space navigation. They continue to search for more discoveries that will benefit society.

Physics students will...

- Obtain a deep understanding of the fundamental principles of science and mathematics.
- Have the ability to use the techniques, skills, and modern tools necessary for physics and engineering careers.
- Have the broad education necessary to understand the impact of physics and engineering solutions in a global, economic, environmental, and societal context.
- Be well prepared to obtain admission to the graduate school of their choice.

Career Planning

Career preparation is part of the mission of Southeast. In fact, more than 90% of Southeast students participate in internships, clinical opportunities, student teaching, research assistantships, and study abroad. All graduates find employment in their field or start the graduate programs of their choice within a few months of graduation.

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

<table>
<thead>
<tr>
<th>Demonstrated Career Proficiency is a Requirement of all Southeast Students</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CL001/CL002</strong> First Semester</td>
</tr>
<tr>
<td><strong>CL003</strong> Junior Year</td>
</tr>
<tr>
<td><strong>CL004</strong> Senior Year</td>
</tr>
</tbody>
</table>

Internship and Employment Opportunities of Recent Graduates

- Schaefer’s Electrical Enclosures
- Southeast Hospital
- Lighting Science Group Corporation
- U. S. Navy Officer
- U. S. Air Force Officer
- Wright Patterson Air Force Base
- Boeing
- Lockheed Martin
- NASA
- National Geospatial Intelligence Agency
- Valspar Corporation
- Rockwell Collins

Graduate Schools and Programs of Recent Graduates

- University of Arkansas – MicroEP Program
- Washington University – Physics
- Missouri S & T – Electrical Engineering
- University of Missouri – Physics
- Ball State University - BioMechanics
- Boise State University – Biomedical Engineering
- Western Kentucky University – Science Teaching
- University of North Texas – Physics
- University of Southern California – Physics
- University of Oklahoma – Physics
- Purdue University – Aerospace Engineering

Admission Requirements

A high school student interested in majoring in engineering physics should complete four years of mathematics that include trigonometry and an introduction to calculus. Four years of science, which include both chemistry and physics, is highly recommended. A strong background in English is essential.

Options with Physics

The physics major is structured in such a way that with the careful selection of technical electives along with a few extra courses, a student may obtain a minor in a cognate discipline such as engineering physics, computer science, or chemistry.
This is a guide based on the 2015-2016 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

"Critical Courses" are italicized and bolded. Data shows that students who have completed this course in the first two years and have earned the noted grade are most likely to complete this program of study.

#### Physics - 56 Hours – No minor required

A grade of "C" or better is required in each course that is a prerequisite course.
- **EP100** Physics and Engineering Concepts (1)
- **EP240** Circuit Analysis (4)
- **EP340** Electronic Circuits (4)
- **EP361** Thermal Analysis (3)
- **EP462** Materials Science (3)
- **PH230/030** General Physics I (5)
- **PH231/031** General Physics II (5)
- **PH341** Optics (3)
- **PH360** Modern Physics (3)
- **PH371** Mechanics (3)
- **PH473** Quantum Mechanics (3)
- **PH477** Physics Seminar (1)
- **PH478** Undergraduate Research (1)
- **PH479** Undergraduate Research (2)
- **PH570** Mathematical Physics (3)
- **UI330** Experimental Methods (3)
- **PH 345** Experimental Methods (3)
- **XX xxx** Technical Electives (6)

#### Support Courses:

A grade of "C" or better is required in each course that is a prerequisite course. This sequence of mathematics courses constitutes a minor, but it must be declared.
- **CH185/085/005** General Chemistry (5)
- **CS177** Programming for Scientists and Engineers (3)
- **MA140** Analytic Geometry and Calculus I (5)
- **MA145** Analytic Geometry and Calculus II (4)
- **MA244** Analytic Geometry and Calculus III (4)
- **MA350** Differential Equations (3)
- **MAxxx** Mathematics Elective (3) (300-500 level)

#### 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, Economic Systems, Political Systems, Social Systems, one or two IU/UJXX**, and one UJXX

*Dependent on what is taken in the major

### SAMPLE FOUR-YEAR PLAN

<table>
<thead>
<tr>
<th>Course #</th>
<th>Hrs</th>
<th>Course #</th>
<th>Hrs</th>
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<tr>
<td><strong>Fall Semester</strong></td>
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<td><strong>Spring Semester</strong></td>
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</tr>
<tr>
<td>UI100</td>
<td>3</td>
<td>EN100</td>
<td>3</td>
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<tr>
<td>CH185/085/005</td>
<td>5</td>
<td>MA145</td>
<td>4</td>
</tr>
<tr>
<td>CS177</td>
<td>3</td>
<td>PH230/030</td>
<td>5</td>
</tr>
<tr>
<td>EP100</td>
<td>1</td>
<td>Behavioral Systems</td>
<td></td>
</tr>
<tr>
<td><strong>MA140</strong></td>
<td>5</td>
<td></td>
<td></td>
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<td><strong>Total</strong></td>
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<td><strong>Total</strong></td>
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Milestone: maintain 2.0 cumulative GPA

<table>
<thead>
<tr>
<th>Course #</th>
<th>Hrs</th>
<th>Course #</th>
<th>Hrs</th>
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<tbody>
<tr>
<td>MA244</td>
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<td>EP240</td>
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<td>PH231/031</td>
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<td>MA350</td>
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<tr>
<td>Living Systems</td>
<td>3</td>
<td>Artistic Expression</td>
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<td>Written Expression</td>
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<td>Development of a Major Civ</td>
<td>3</td>
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<tr>
<td></td>
<td></td>
<td>Literature Expression</td>
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<td><strong>Total</strong></td>
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Milestone: maintain 2.0 cumulative GPA

*Summer courses are encouraged to avoid 18-hour semesters.

### Third Year

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<td>3</td>
<td>EP340</td>
<td>4</td>
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<tr>
<td>PH360</td>
<td>3</td>
<td>EP462</td>
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<tr>
<td>PH370</td>
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<td>PH473</td>
<td>3</td>
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<tr>
<td><strong>UI330 or PH 345</strong></td>
<td>3</td>
<td>Math Elective</td>
<td>3</td>
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<tr>
<td>Oral Expression***</td>
<td>3</td>
<td>IU/UJXX</td>
<td>3</td>
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<tr>
<td><strong>Total</strong></td>
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<td>16</td>
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Milestone: maintain 2.0 cumulative GPA

### Fourth Year

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<td>PH371</td>
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<td>PH341</td>
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<td>PH477</td>
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<td>PH478</td>
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<td>PH570</td>
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<tr>
<td>Technical Elective</td>
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<tr>
<td>Economic Systems</td>
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<td>Social Systems</td>
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<tr>
<td>Political Systems</td>
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<td>UJXX</td>
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<td><strong>Total</strong></td>
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</table>

Milestone: maintain 2.0 cumulative GPA

A "Milestone" signifies a significant stage for a student in the completion of a degree.

**If PH345 is taken, the student must complete an additional IU/UJXX course.

***SC105 highly recommended by department

**Degree requirements for all students:** A minimum of 120 credit hours, completion of University Studies program, career proficiency (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 DegreeWorks for additional graduation requirements (i.e., minimum GPA and course work) for your program of study.

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For advising
College of Science, Technology and Agriculture
Advising Center (573) 651-5930
costadvising@semo.edu
www.semo.edu/costa/advising

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