COLLEGE OF SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS

Physics

SOUTHEAST MISSOURI STATE UNIVERSITY · 1873®

Bachelor of Science (BS)

Physics

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. The interest of physicists extends from the vast world of stars and galaxies to the minute world of atoms and elementary particles. As a physicist you'll learn about the basic building blocks and rules of the universe. Four forces rule them all. Current estimates are that 95% of the universe is made of dark matter and dark energy, which are virtually unknown.

Physics 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. 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.

Becoming Career Ready...

/ Faculty-mentored research will help you develop the professional skills needed for success in a competitive job market and/or advanced study in graduate and professional programs. Our physics classes are small, so you'll get individual attention from professors that are experts in their fields.

/ The Physics curriculum prepares graduates for careers as professional physicists and serves as an excellent basis for graduate and professional programs of study. Example job titles include applications engineer, data analyst, design engineer, physics teacher, laser engineer and systems analyst.

/ 100% of Southeast programs offer real-world experience. Physics students earn this experience and training using the techniques, skills, and modern tools necessary for physics and engineering careers. Students have opportunities to be involved in research from day one, because we believe that learning through experience is the best way to engage you in the scientific process and deepen your passion for knowledge.

/ The path to a successful career starts with you! You can maximize your career development by working closely with Career Services and Southeast faculty – they are here to help you connect your passions, interests and skills in the sciences to jobs and opportunities in industry. Career Services provides professional career counseling and coaching, resume critiques, practice interviews, job search strategies, career events, networking opportunities and more.

Placement of Our Graduates:

- Lighting Science Group Corporation
- Monsanto
- Texas Instruments
- 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
- Schaefer's Electrical Enclosures
- Southeast Hospital
- 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

Special 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, biology, or chemistry.

Career Information

According to the United States Bureau of Labor Statistics, there were 19900 physics and astronomy related jobs in 2016. This number is expected to increase by 14% by 2026. Median pay for astronomers was **$104,740** and **$115,870** for physicists in 2016. Source: https://www.bls.gov/ooh/life-physical-and-social-science/physicists-and-astronomers.htm.

Transfer and Dual Credit Students

If you have dual credit or transfer credit, please visit our transfer course equivalencies guide at semo.edu/transfercredit.

To learn more
Office of Admissions
(573) 651-2590
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semo.edu

To explore
the College of Science, Technology, Engineering and Mathematics
online, visit
semo.edu/stem

For advising
Center for Academic Advising
semo.edu/advising

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Degree Map 2020-2021

This is a guide based on the 2020-2021 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 Degree Works 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 (3)
___ EP240 Circuit Analysis (4)
___ EP340 Electronic Circuits (4)
___ EP361 Thermal Analysis (3)
___ EP462 Materials Science (3)
___ PH230 General Physics I (5)
___ PH231 General Physics II (5)
___ PH341 Optics (3)
___ PH345 Experimental Methods (3)
___ PH360 Modern Physics (3)
___ PH370 Mechanics (3)
___ PH371 Electromagnetics (3)
___ PH473 Quantum Mechanics (3)
___ PH477 Physics Seminar (1)
___ PH478 Undergraduate Research (1)
___ PH479 Undergraduate Research (2)
___ PH570 Mathematical Physics (3)
___ XX xxx Technical Electives (8)

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 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)
___ MA345 Linear Algebra (3)
___ MA350 Differential Equations (3)

General Education Requirements – some requirements may be fulfilled by coursework in major program

- Social and Behavioral Sciences – 6 hours
- Constitution Requirement – 3 hours
- Written Communication – 6 hours
- Oral Communication – 3 hours
- Natural Sciences – 7 hours (from two disciplines, one to include a lab)
- Mathematics – 3 hours
- Humanities & Fine Arts – 9 hours (from at least two disciplines)
- Additional requirements – 5 hours (to include UI100 for native students)
- Civics examination

SAMPLE FOUR-YEAR PLAN

	Fall Semester		Spring Semester	
	Course #	Hrs	Course #	Hrs
FIRST YEAR	CH185/085/005	5	UI100	3
	CS177	3	MA145	4
	EP100	3	PH230/030	5
	MA140	5	General Education	3
	Total	**16**	**Total**	**15**
	Milestone: maintain 2.0 cumulative GPA			
SECOND	MA244	4	EP240	4
	PH231/031	5	MA345	3
	General Education	3	MA350	3
	General Education	3	General Education	3
			General Education	3
	Total	**15**	**Total**	**16**
	Milestone: maintain 2.0 cumulative GPA			

(Summer courses are encouraged to avoid 18-hour semesters.)

THIRD YEAR	EP361	3	EP340	4
	PH345	3	EP462	3
	PH360	3	PH473	3
	PH370	3	Technical Elective	2
	General Education	3	General Education	3
	Total	**15**	**Total**	**15**
	Milestone: maintain 2.0 cumulative GPA			
FOURTH YEAR	PH371	3	PH341	3
	PH477	1	PH479	2
	PH478	1	PH570	3
	Technical Elective	3	Technical Elective	3
	General Education	3	General Education	3
	General Education	3		
	Total	**14**	**Total**	**14**
	Milestone: maintain 2.0 cumulative GPA			

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

Degree requirements for all students: *a minimum of 120 credit hours, completion of the General Education program, and completion of 39 senior division hours (300-599). Refer to the Undergraduate Bulletin or Degree Works for additional graduation requirements for your program.*

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To learn more
Office of Admissions
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To explore the College of Science, Technology, Engineering and Mathematics online, visit semo.edu/stem

For advising
Center for Academic Advising
semo.edu/advising