



Physics BS

with an emphasis in Engineering Physics

Physicists strive to understand the fundamental nature of the forces and particles, and the resultant states of matter, that make up the physical world. Our Engineering Physics degree provides a grounding in this approach with an added emphasis on practical applications. The Department of Physics and Astronomy at UMSL provides a broad-based education in the fundamental concepts of engineering physics, with the experimental and theoretical skills essential to practicing scientists. Undergraduate education in physics prepares students for both graduate study and a wide variety of professional careers in fields such as applied physics and engineering.

Career Outlook

Many of our students have been successful in subsequent graduate studies in astrophysics and meteorology, as well as physics. Our alumni have pursued graduate studies and earned doctorate degrees at institutions such as Cornell University, MIT, University of Wisconsin, University of Chicago, and Washington University. Students who have elected for careers in industry are now working in a variety of settings for such firms as Emerson Electric, Hewlett Packard, IBM, Boeing, and MEMC Electronic Materials (now SunEdison). Several former students teach physics in high schools around the St. Louis area.

Future Career Options

- Aerospace Engineer
- Civil Engineer
- Electrical Engineer
- Environmental Engineer
- High School Physics/Science Teacher
- Materials Physicist/Engineer
- Mechanical Engineer
- National Geospatial-Intelligence Agency
- Renewable Energy Researcher at Nonprofit
- Systems Engineer
- University Professor

Skills Developed By Degree Completion

- Understand classical mechanics, electricity and magnetism, thermal and statistical physics, quantum mechanics, and modern electronics
- Design and perform basic physics experiments, assess the significance of their results, and interpret the observed outcome
- Understand statics, dynamics, and electrical networks
- Problem-solving, critical thinking, and analytical reasoning
- Write and orally communicate the results of scientific work
- Conduct original scientific research as part of a problem-solving team
- Identify errors in scientific data, and assess the significance of observed results

Successful alumni have gone on to fulfill many of the opportunities above. Additional possibilities are taken from the Bureau of Labor Statistics. Contact an advisor to discuss additional future career options.

IT STARTS RIGHT NOW

This is a sample academic map for the courses to take each academic semester/session. This map is not a substitute for academic advisement. Contact your advisor when making final selections.



UNIVERSITY STUDIES

University studies is required for all first-year students and those with less than 24 credit hours.



MILESTONE COURSES

Milestone courses should be taken in the order shown to ensure you stay on a timely and accurate path toward graduation.



SUMMER AND INTERSESSION COURSES

Don't forget that summers and winter breaks are a way to fast-track your route to degree completion – and lighten your load during fall and spring!

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2024-2025 4-YEAR ACADEMIC MAP

Bachelor of Science in Physics with an emphasis in Engineering Physics

Year

1

FALL SEMESTER (15 credit hours)

CHEM 1111: Introductory Chemistry I (5)
ENGL 1100: First-Year Writing (3)
INTDSC 1003: University Studies (1)
MATH 1030: College Algebra (3)
MATH 1035: Trigonometry (2)
PHYSICS 1099: Windows on Physics (1)

SPRING SEMESTER (14 credit hours)

MATH 1800: Analytic Geometry and Calculus I (5)
CMP SCI 1250: Introduction to Computing (3)
GEN ED CORE: US History and Government (3)
GEN ED EXPLORE: Social Sciences (3)



Check once completed

Year

2

FALL SEMESTER (16 credit hours)

MATH 1320: Introduction to Probability and Statistics (3)
MATH 1900: Analytic Geometry and Calculus II (5)
PHYSICS 2111: Physics: Mechanics, and Heat (4)
PHYSICS 2111L: Physics: Mechanics, and Heat Laboratory (1)
GEN ED CORE: Communication Proficiency (3)

SPRING SEMESTER (16 credit hours)

PHYSICS 2112: Electricity, Magnetism, and Optics (4)
PHYSICS 2112L: Electricity, Magnetism, and Optics Laboratory (1)
MATH 2000: Analytic Geometry and Calculus III (5)
MATH 2450: Elementary Linear Algebra (3)
ENGR 2310: Statics (3)



Year

3

FALL SEMESTER (15 credit hours)

ENGR 2320: Dynamics (3)
MATH 2020: Introduction to Differential Equations (3)
PHYSICS 3200: Math Methods of Theoretical Physics (3)
PHYSICS 3231: Introduction to Modern Physics (3)
Cultural Diversity Requirement (3)

SPRING SEMESTER (15 credit hours)

ENGR 2300: Introduction to Electrical Networks (3)
PHYSICS 3221: Mechanics (3)
PHYSICS 3223: Electricity and Magnetism (3)
PHYSICS 4341: Thermal and Statistical Physics (3)
GEN ED EXPLORE: Humanities and Fine Arts (3)



Year

4

FALL SEMESTER (15 credit hours)

ENGL 3160: Writing in the Sciences (3)
PHYSICS 4310: Modern Electronics (3)
PHYSICS 4323: Modern Optics (3)
PHYSICS 4331: Introduction to Quantum Mechanics (3)
GEN ED EXPLORE: Social Sciences (3)

SPRING SEMESTER (15 credit hours)

CMP SCI 2XXX: Computer Science Course (3) or MATH 3XXX: Mathematics Course (3)
PHYSICS 4311: Advanced Physics Laboratory I (3)
GEN ED EXPLORE: Humanities and Fine Arts (3)
GEN ED EXPLORE: Humanities and Fine Arts (3)
GEN ED EXPLORE: Social Sciences (3)

