



Physics BS

with an emphasis in Biophysics

Biophysicists investigate how biological systems function using various physics techniques, as well as the fundamental nature of forces, particles, and states of matter that make up the physical world. The Department of Physics and Astronomy at UMSL is devoted to providing undergraduates with a broad-based education in the fundamental concepts of biophysics with the experimental and theoretical skills essential to practicing scientists. Undergraduate education in biophysics prepares students for both graduate study and professional careers in fields such as medical physics, environmental science, biomedical engineering, and neuroscience.

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

- Biomedical Engineer
- Biophysics Researcher
- Environmental Scientist
- High School Physics/Science Teacher
- Materials Scientist at National Library
- Medical Physicist
- Nanotechnology Researcher
- National Geospatial-Intelligence Agency
- Nuclear Medicine Specialist
- Physician
- University Professor

Skills Developed By Degree Completion

- Understand classical mechanics, electricity and magnetism, thermal and statistical physics, modern electronics, and quantum mechanics
- Understand basic biological concepts, from organ systems to biochemistry
- Understand basic concepts of biophysics, and the various areas of interdisciplinary science where biophysics concepts and techniques are applicable
- Problem-solving, critical thinking, and analytical reasoning as applied to scientific problems
- Proficiency in written and oral communication of 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.

2024-2025 4-YEAR ACADEMIC MAP

Bachelor of Science in Physics with an emphasis in Biophysics

FALL SEMESTER (15 credit hours)

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

SPRING SEMESTER (15 credit hours)

BIOL 1831: Introductory Biology: From Molecules to Organisms (5)
CHEM 1121: Introductory Chemistry II (5)
MATH 1800: Analytic Geometry and Calculus I (5)

FALL SEMESTER (18 credit hours)

BIOL 1821: Introductory Biology: Organisms and the Environment (5)
CMP SCI 1250: Introduction to Computing (3)
MATH 1900: Analytic Geometry and Calculus II (5)
PHYSICS 2111: Physics: Mechanics, and Heat (4)
PHYSICS 2111L: Physics: Mechanics, and Heat Laboratory (1)

SPRING SEMESTER (16 credit hours)

CHEM 2612: Organic Chemistry I (3)
MATH 2000: Analytic Geometry and Calculus III (5)
PHYSICS 2112: Electricity, Magnetism, and Optics (4)
PHYSICS 2112L: Electricity, Magnetism, and Optics Laboratory (1)
GEN ED CORE: US History and Government (3)

FALL SEMESTER (15 credit hours)

BIOL 4712: Biochemistry (3) or CHEM 4712: Biochemistry (3)
PHYSICS 3200: Math Methods of Theoretical Physics (3)
PHYSICS 3231: Introduction to Modern Physics (3)
MATH 2020: Introduction to Differential Equations (3)
GEN ED CORE: Communication Proficiency (3)

SPRING SEMESTER (14 credit hours)

BIOL 4713: Techniques in Biochemistry (2)
PHYSICS 3221: Mechanics (3)
PHYSICS 3223: Electricity and Magnetism (3)
PHYSICS 4341: Thermal and Statistical Physics (3)
GEN ED EXPLORE: Social Sciences (3)

FALL SEMESTER (15 credit hours)

ENGL 3160: Writing in the Sciences (3)
PHYSICS 4310: Modern Electronics (3)
PHYSICS 4331: Introduction to Quantum Mechanics (3)
Cultural Diversity Requirement (3)
GEN ED EXPLORE: Humanities and Fine Arts (3)

SPRING SEMESTER (16 credit hours)

PHYSICS 4347: Introduction to Biophysics (3)
GEN ED EXPLORE: Humanities and Fine Arts (3)
GEN ED EXPLORE: Humanities and Fine Arts (3)
GEN ED EXPLORE: Social Sciences (3)
GEN ED EXPLORE: Social Sciences (3)

Year
1

Year
2

Year
3

Year
4

Check once completed



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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