

College of Engineering **Engineering Physics**

DEGREE: Bachelor of Science in Engineering Physics

The Engineering Physics program is offered jointly by the Physics Department and the College of Engineering. The faculty is drawn from the Departments of Physics, Electrical and Computer Engineering, and Mechanical Engineering.

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The B.S. in Engineering Physics Program is designed to provide quality education of students for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories, and public sectors. The Program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies, and effective communicational skills. The B.S. in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The Engineering Physics Program is offered jointly by the Department of Physics and College of Engineering. The B.S. in Engineering Physics confers an engineering credential. Students in the program complete an engineering core curriculum, either in Electrical and Computer Engineering or in Mechanical Engineering, as well as a rigorous course of study in physics and mathematics. A strong laboratory component prepares students in experimental techniques and technology using state-of-the-art equipment.

The goals of the program are:

- to give students a strong education in the fundamentals of physics, engineering, applied mathematics, and computation;
- to develop skill in real-world problem solving starting from fundamental physical principles;
- to improve communication skills; and
- to develop ability to work in a team

The student must choose either the Electrical Engineering Option or the Mechanical Engineering Option. The requirements are listed below. A grade of C or better is required for all required courses.

Requirements for Electrical Option (128 credits)

Physics (40 credits)

PHYS 213	Mechanics	3
PHYS 213L	Experimental Mechanics	1
PHYS 214	Electricity and Magnetism	3
PHYS 214L	Electricity and Magnetism Laboratory	1
PHYS 217	Heat, Light, and Sound	3
PHYS 217L	Experimental Heat, Light, and Sound	1
PHYS 315	Modern Physics	3
or PHYS 325	Semiconductor Materials and Devices	
PHYS 315L	Experimental Modern Physics	2
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 475	Advanced Experimental Modern Physics	2
or PHYS 471	Modern Experimental Optics	
PHYS 480	Thermodynamics	3
PHYS 495	Mathematical Methods of Physics I	3
Physics electives		6

Electrical Engineering (41 credits)

EE 111	Intro. To Electrical and Computer Engineering	4
EE 161	Computer Aided Problem Solving	4
EE 211	AC Circuits	4
EE 221	Electronics I	4
EE 261	Digital Design I	4
EE 311	Signals and Systems	4
EE 315	Electromagnetics I	4
EE 341	Control Systems	4
or EE 332	Introduction to Electrical Power Engineering	
EE 498	Capstone Design I	3
EE 499	Capstone Design II	3
Electrical Engineering elective		3

Mathematics (15 credits)

MATH 191	Calculus and Analytic Geometry I	3
MATH 192	Calculus and Analytic Geometry II	3
MATH 291	Calculus and Analytic Geometry III	3
MATH 391	Vector Analysis	3
MATH 392	Ordinary Differential Equations	3

Natural Science (4 credits)

CHEM 111	General Chemistry I	4
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Additional General Education (28 credits)

ENGL 111G Rhetoric and Composition	4
ENGL 218G Technical and Scientific Communication	3
Critical Thinking/Analysis Elective (non-computer)	3
Historical Perspective Elective	3
Human Thought Elective	3
Social Analysis Elective	3
Literature/Fine Arts Elective	3
Viewing a Wider World Electives*	6

* Viewing a Wider World courses cannot be taken in Engineering or Physics.

Requirements for Mechanical Option (129 credits)

Physics (37 credits)

PHYS 213 Mechanics	3
PHYS 213L Experimental Mechanics	1
PHYS 214 Electricity and Magnetism	3
PHYS 214L Electricity and Magnetism Laboratory	1
PHYS 217 Heat, Light, and Sound	3
PHYS 217L Experimental Heat, Light, and Sound	1
PHYS 315 Modern Physics	3
or PHYS 325 Semiconductor Materials and Devices	
PHYS 315L Experimental Modern Physics	2
PHYS 454 Intermediate Modern Physics I	3
PHYS 455 Intermediate Modern Physics II	3
PHYS 461 Intermediate Electricity and Magnetism I	3
PHYS 462 Intermediate Electricity and Magnetism II	3
PHYS 475 Advanced Experimental Modern Physics	2
or PHYS 471 Modern Experimental Optics	
PHYS 495 Mathematical Methods of Physics I	3
Physics elective	3

Mechanical Engineering (45 credits)

ME 102 Introduction to Mechanical Engineering	3
ME 159 Graphical Communication and Design	3
ME 236 Engineering Mechanics I	3
ME 235 Mechanics of Materials	3
ME 237 Engineering Mechanics II	3
ME 240 Thermodynamics	3
ME 260 ME Problem Solving	3
ME 328 Engineering Analysis I	3
ME 329 Engineering Analysis II	3
ME 333 Intermediate Dynamics	3
ME 338 Fluid Mechanics	3
ME 341 Heat Transfer	3
ME 426 Design Project Laboratory I	3
ME 427 Design Project Laboratory II	3
ME 449 Senior Seminar	1
Engineering elective	3

Mathematics (15 credits)

MATH 191 Calculus and Analytic Geometry I	3
MATH 192 Calculus and Analytic Geometry II	3
MATH 291 Calculus and Analytic Geometry III	3
MATH 392 Ordinary Differential Equations	3
Math elective from ME list	3

Natural Science (4 credits)

CHEM 111 General Chemistry I	4
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Additional General Education (28 credits)

ENGL 111G Rhetoric and Composition	4
ENGL 218G Technical and Scientific Communication	3
Critical Thinking/Analysis Elective (non-computer)	3
Historical Perspective Elective	3
Human Thought Elective	3
Social Analysis Elective	3
Literature/Fine Arts Elective	3
Viewing a Wider World Electives*	6

* Viewing a Wider World courses cannot be taken in Engineering or Physics.

College of Arts and Sciences

Physics

DEGREE: Bachelor of Science in Engineering Physics

MAJOR: Physics

The Bachelor of Science in Engineering Physics is a joint degree program of the Physics Department and the College of Engineering. This degree is ideal preparation for technical careers in high-tech industries, research laboratories and the public sector. It also provides an excellent preparation for graduate studies in physics or engineering. A full description of the program requirements can be found in the Engineering College section of this catalog on page .