

# Engineering Physics Program

*"Engineering physicists explore the universe in search of solutions for problems that need to be understood."*

— W. G. Berlinger, class of 1986.

Students majoring in engineering physics will receive a Bachelor of Science degree with a major in engineering physics. This degree is offered through the cooperation of the faculties of the Department of Physics and the College of Engineering and Technology. The program is monitored by the Engineering Physics Advisory Committee which is made up of representatives from the physics department and the College of Engineering and Technology. The physics department is responsible for the administration of the program.

The program is designed to provide the student with a strong background in basic science and mathematics while at the same time developing in them the ability to apply pertinent knowledge to the practice of engineering. Graduates of the program will be prepared to pursue graduate studies in physics, engineering, or related fields and to hold significant positions in government and industry. Like most engineers employed in research and development, the engineering physicist will be involved in designing, developing, and supervising the construction of new and often unique devices utilizing basic scientific information. The strong background of the engineering physicist in the basic and engineering sciences and mathematics affords the graduate of the program a wide variety of employment and educational opportunities. Many of these opportunities are different from those of the traditional engineering disciplines, particularly at the entry level of employment.

## **Specified Core Courses**

All courses named specifically in the curriculum outline are required. For more specific information see the Physics Department material in the College of Liberal Arts and Sciences section of this catalog. Substitution or waiver of these courses for other courses taken at Bradley or transferred into the program from another institution can be made only at the discretion of the Engineering Physics Advisory Committee.

## **General Education Requirements**

The student's selection of humanities and social science courses should provide a broad education consistent with the objectives of the engineering profession. It is recommended that two of the courses chosen to meet the non-western civilization (NW), fine arts (FA), human values (HL or HP) or social forces (SF) general education requirements be taken from the same program with one being lower level (100 or 200 level) and one being advanced level (300 or above). Students who wish to transfer courses from another institution to meet the general education requirements must have them approved by a transfer admissions counselor.

## **Engineering Topics**

Upon entering the University students will work in close consultation with academic advisors in physics and engineering to develop a four-year sequence of courses which forms a curriculum with a particular engineering emphasis. These courses are taken from an approved

list of course offerings in the departments of Civil Engineering and Construction, Mechanical Engineering, Electrical and Computer Engineering, Industrial and Manufacturing Engineering and Technology, and Physics. Engineering topics constitute 41 semester hours with the majority of the courses being engineering science and design. The course work must provide for a particular engineering orientation, such as materials engineering, signals and systems engineering, electromagnetism, or another emphasis that can be constructed from the list of approved courses.

## Engineering Physics Courses Core

### First Semester

PHY 199 Freshman Seminar .....	1
CHM 110 General Chemistry I .....	3
CHM 111 General Chemistry Lab.....	1
MTH 121 Calculus I .....	4
ME 101 Foundations of Mechanical Engineering or Gen. Ed. (FA) .....	2-3
ME 103 Computation Techniques for ME <b>or</b> EE 101 Intro EE .....	1
ENG 101 English Composition .....	3
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	15-16

### Second Semester

PHY 110 University Physics I.....	4
CHM 112 Engineering Chemistry .....	3
MTH 122 Calculus II .....	4
COM 103 Oral Communication Process .....	3
ME 102 Engin. Design Graphics <b>or</b> EE 102 Computers and Programming in EE.....	2
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### Sophomore Year

#### First Semester

PHY 201 University Physics II.....	4
MTH 223 Calculus III .....	4
Gen. Ed. (CIV 100) .....	3
Gen. Ed. (FA or HV, Philosophy) .....	3
Engineering Topics (Approved).....	3
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#### Second Semester

PHY 202 Applied Quantum Physics .....	3
PHY 350 Applied Quantum Physics Lab.....	1
MTH 224 Differential Equations .....	4
Gen. Ed. (Social Forces) .....	3
Engineering Topics (Approved).....	3
Gen. Ed. (Non-Western Civilization).....	3
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### Junior Year

#### First Semester

PHY 305 Electricity and Magnetism.....	3
PHY 301 Classical Mechanics .....	3
ENG 305 Technical Writing .....	3
Engineering Topics (Approved).....	6-3
Gen. Ed. (Human Values - Philosophy) .....	3-0
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### Second Semester

PHY 361 Electronics.....	3
PHY 306 Electromagnetic Waves.....	3
MTH 207 Linear Algebra .....	3
Engineering Topics (Approved).....	6
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### Senior Year

#### First Semester

PHY 501 Quantum Mechanics I .....	3
PHY and EGT Design Project.....	3
PHY 467 Stat. & Thermal Physics .....	3
Gen. Ed. (Social Forces).....	3
Engineering Topics (Approved).....	6
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#### Second Semester

PHY and EGT Design Project.....	3
PHY 320 Optics .....	3
PHY 350 Optics Lab.....	1
PHY or MTH Elective .....	3
Engineering Topics (Approved).....	6
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Total Hours	129-130