

# PHYSICS, BACHELOR OF SCIENCE WITH A CONCENTRATION IN ENGINEERING PHYSICS (B.S.)

## Program Objectives

Upon completion of this program the graduate will:

1. be able to apply mathematics to analyze problems in Physics;
2. be able to use fundamental physical results, such as conservation laws, to study physical systems;
3. be able to analyze important processes occurring in physical systems.

Additionally, graduates of this program will:

1. be prepared for employment in Physics or a related field in the public or private sector;
2. be prepared for admission to a graduate program in Physics or a related field;
3. be prepared to take and pass the Praxis exam in Physics; and physics teaching majors will be prepared to teach Physics in a secondary school.

## Program Requirements

CIP Code: 40.0801

### Summary Checklist for General Education

Code	Title	Hours
<b>Element 1</b>		
A:	Written Communication ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-1/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-1/</a> )	3
B:	Written Communication ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-1/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-1/</a> )	3
C:	Oral Communication ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-1/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-1/</a> )	3
<b>Element 2</b>		
	Quantitative Reasoning ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-2/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-2/</a> )	3
<b>Element 3</b>		
A:	Arts ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-3/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-3/</a> )	3
B:	Humanities ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-3/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-3/</a> )	3
<b>Element 4</b>		
	Natural Sciences ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-4/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-4/</a> )	6
<b>Element 5</b>		

A:	Historical Science ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-5/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-5/</a> )	3
B:	Social Behavioral Science ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-5/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-5/</a> )	3
<b>Element 6</b>		
	Diversity of Perspectives Experiences ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-6/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-6/</a> )	6
<b>Total Hours</b>		<b>36</b>

Students are expected to complete Elements 1 and 2 within their first 60 hours of college credit.

## Major

Code	Title	Hours
<b>University Graduation Requirements</b>		
General Education		36
<i>Student Success Seminar</i>		
SCO 100P	Student Success Seminar in Physics (waived for transfers with 30+ hrs.)	1
Upper division courses (42 hrs. distributed throughout Major/ Supporting/Gen Ed/Free Electives categories)		
<b>Major Requirements</b>		
<i>Core Courses</i>		
PHY 201 or PHY 131	University Physics I <sup>1</sup> College Physics I	5
PHY 202 or PHY 132	University Physics II <sup>2</sup> College Physics II	5
PHY 211	Intermediate Physics	4
PHY 302 or PHY 302W	Modern Physics Modern Physics	4
PHY 406 or PHY 406W	Advanced Physics Laboratory	3
<b>Concentrations</b>		
Students must select one of the following Concentrations:		
Physics (General)		
Engineering Physics	Physics Teaching	41
<i>Supporting Course Requirements</i>		
<i>Free Electives</i>		
Choose from 21 hours of free electives <sup>3</sup>		21
<b>Total Hours</b>		<b>120</b>

1

At the discretion of the chair, PHY 131 College Physics I may be substituted for PHY 201 University Physics I.

2

For teaching majors PHY 132 College Physics II may be substituted for PHY 202 University Physics II.

3

Students who are interested in Medical Physics graduate programs are encouraged to take EHS 510 Radiological Health and Safety as a free elective.

### Concentration

Code	Title	Hours
<b>Concentration Courses</b>		
PHY 221	Statics	3
PHY 310	Theoretical Methods in Physics	3
PHY 315	Electrical Circuits	4
PHY 375	Engineering Thermodynamics	3
PHY 460	Classical Mechanics	4
Choose from three hours of the following:		3
CSC 185	Discrete Structures I	
EET 253	Microprocessor Control Systems	
EET 257	Electronic Devices and Circuits	
EET 351	Programmable Logic Controllers	
PHY 303	Introduction to Laser Physics	
PHY 402	Modern Optics	
PHY 410	Independent Study in Physics:___	
PHY 411	Special Topics in Physics:	
PHY 412	Directed Research in Physics:	
STA 270	Applied Statistics	
<i>Supporting Course Requirements</i>		
CHE 111 & 111L	General Chemistry and General Chemistry Lab I (Element 4) <sup>G</sup>	
CHE 112 & 112L	General Chemistry II and General Chemistry Lab	4
CSC 174	Introduction to Programming for Science & Engineering	3
EET 252	Digital Electronics	3
MAT 234	Calculus I (Element 2) <sup>G,1</sup>	
MAT 244	Calculus II	4
MAT 254	Calculus III	4
MAT 353	Differential Equations	3
<b>Total Hours</b>		<b>41</b>

#### G

Course also satisfies a General Education element. Hours are included within the 36 hr. General Education requirement above. Note that a max of 3 credit hours from one course may be applied each to any Gen. Ed. element.

1

A preparatory course (MAT 122 Precalculus Mathematics) in mathematics may be required before admission to MAT 234 Calculus I.