

# PHYSICS, BACHELOR OF SCIENCE WITH A CONCENTRATION IN PHYSICS (GENERAL) (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 (<http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-5/>) 3

B: Social Behavioral Science (<http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-5/>) 3

### Element 6

Diversity of Perspectives Experiences (<http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/element-6/>) 6

**Total Hours** 36

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

## Major

Code	Title	Hours
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### University Graduation Requirements

General Education	36
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### Student Success Seminar

SCO 100P	Student Success Seminar in Physics (waived for transfers with 30+ hrs.)	1
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Upper division courses (42 hrs. distributed throughout Major/ Supporting/Gen Ed/Free Electives categories)

### Major Requirements

#### Core Courses

PHY 201	University Physics I <sup>1</sup>	5
or PHY 131	College Physics I	

PHY 202	University Physics II <sup>2</sup>	5
or PHY 132	College Physics II	

PHY 211	Intermediate Physics	4
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PHY 302	Modern Physics	4
or PHY 302W	Modern Physics	

PHY 406	Advanced Physics Laboratory	3
or PHY 406W	Advanced Physics Laboratory	

### Concentrations

Students must select one of the following Concentrations:

Physics (General)	40
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Engineering Physics	
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Physics Teaching	
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### Free Electives

Choose from 22 hours of free electives <sup>3</sup>	22
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**Total Hours** 120

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 310	Theoretical Methods in Physics	3
PHY 421	Electricity and Magnetism I	3
PHY 422	Electricity and Magnetism II	3
PHY 456	Statistical and Thermal Physics	3
PHY 460	Classical Mechanics	4
PHY 470	Quantum Mechanics	3
Choose from three hours of any PHY course numbered 300 and above <sup>1</sup>		3
<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
MAT 234	Calculus I (Element 2) <sup>G,2</sup>	
MAT 244	Calculus II	4
MAT 254	Calculus III	4
MAT 353	Differential Equations	3
<b>Total Hours</b>		<b>40</b>

<sup>1</sup>

Except PHY 506 Physics for High School Teachers

<sup>2</sup>

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

**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.