PHYSICS, BACHELOR OF SCIENCE (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.
4. be prepared for employment in Physics or a related field in the public or private sector;
5. be prepared for admission to a graduate program in Physics or a related field;
6. 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

Major

Code	Title	Hours
University Graduation Requirements		
General Education (http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/)		36
Foundations of Learning		
GSD 101	Foundations of Learning	3
Upper division courses (42 hrs. distributed throughout Major/ Supporting/Gen Ed/Free Electives categories)		
Major Requirements		
Core Courses		
PHY 201	University Physics I [1]	5
or PHY 131	College Physics I	
PHY 202	University Physics II [2]	5
or PHY 132	College Physics II	
PHY 211	Intermediate Physics	4
PHY 302	Modern Physics	4
PHY 315	Electrical Circuits	4
PHY 406	Advanced Physics Laboratory	4
MAT 244	Calculus II	4
CHE 112 & 112L	General Chemistry II and General Chemistry Lab	4
CSC 174	Introduction to Programming for Science & Engineering	3
Concentrations		
Students must select one of the following Concentrations:		28-47
Physics (General)		
Engineering Physics		
Physics Teaching		
Free Electives [3]		*13-15*
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.

Engineering Physics Concentration

Code	Title	Hours
Concentration Courses		
PHY 221	Statics	3
PHY 310	Theoretical Methods in Physics	3
PHY 360	Engineering Dynamics	3-4
or PHY 460	Classical Mechanics	
PHY 375	Engineering Thermodynamics	3
PHY 380	Fluid Mechanics	3
Choose from three hours of the following:		3
CSC 185	Discrete Structures I	
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	
Supporting Course Requirements		
CHE 111 & 111L	General Chemistry and General Chemistry Lab I (Element 4) [G]	
EET 252	Digital Electronics	3
MAT 234	Calculus I (Element 2) [G,1]	
MAT 254	Calculus III	4
MAT 353	Differential Equations	3
Total Hours		**28-29**

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.

Physics (General) Concentration

Code	Title	Hours
Concentration Courses		
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 [1]		3
Supporting Course Requirements		
CHE 111 & 111L	General Chemistry and General Chemistry Lab I (Element 4) [G]	
MAT 234	Calculus I (Element 2) [G,2]	
MAT 254	Calculus III	4
MAT 353	Differential Equations	3
Total Hours		**29**

[1] Except PHY 506 Physics for High School Teachers

[2] 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.

Physics Teaching Concentration

Code	Title	Hours
Concentration Courses		
AST 135	Introductory Astronomy	3
AST 335	Stars, Galaxies, & Cosmology	3
Choose from three hours of PHY courses numbered 300 and above		3
Supporting Course Requirements		
BIO 100	Introductory Biology (Element 4) [G]	
or BIO 102	Inquiry Biology for Teachers	
CHE 111 & 111L	General Chemistry and General Chemistry Lab I (Element 4) [G]	
MAT 234	Calculus I (Element 2) [G,1]	
Professional Education Requirements		
EDC 300	Differentiation in Inclusive Classrooms	3
EDF 203	Educational Foundations	3
EDF 204	Emerging Instructional Technologies	2
EDF 219	Human Development and Learning	3
EDF 413	Assessment in Education	3
EMS 300	Curriculum and Instructional Design	3
EMS 474	Disciplinary Literacy	3
EMS 490	Classroom & Behavior Management	3
ESE 561	Teaching Science in Secondary School	3
SED 104	Special Education Introduction (Element 6) [G]	
Clinical Experiences:		
CED 100	Clinical I: Introduction to the Education Profession	0.5
CED 200	Clinical II: Understanding the Learner	0.5
CED 300	Clinical III: Curriculum and Instructional Design	0.5
CED 400	Clinical IV: Diagnosis and Prescription	0.5
CED 450	Clinical V: Practicing Teaching	1
CED 499	Clinical VI: The Professional Semester	9
Exit Requirements		
PRAXIS Examination		
Students must register for and take the PRAXIS exam which correlates to their degree program, per College of Education requirements. Refer to Degree Works for exam details. The PRAXIS exam must be taken prior to student teaching.		
Total Hours		**47**

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.