



This roadmap is a recommended semester-by-semester plan of study for this major. However, courses and milestones designated as critical (in boldface and shaded areas) must be completed in the semester listed to ensure a timely graduation.

Course Subject and Title	Credit Hours	Upper Div.	Min. Grade	Major GPA	Important Notes
<b>Semester One: [15 Credit Hours]</b>					
<b>MATH 12002 Analytic Geometry and Calculus I</b>	5			■	<b>Fulfills Kent Core Mathematics and Critical Reasoning; enrollment based on placement tests; prerequisites: MATH 11010 and 11022 may be bypassed with sufficient background</b>
PHY 12000 Introductory Physics Seminar	1			■	
<b>PHY 23101 General University Physics I</b>	5			■	<b>Fulfills Kent Core Basic Sciences</b>
US 10097 Destination Kent State: First Year Experience	1				Not required for transfer students with 25 credits
Kent Core Requirement	3				See Kent Core Summary on page 2
<b>Semester Two: [16 Credit Hours]</b>					
<b>MATH 12003 Analytic Geometry and Calculus II</b>	5			■	
<b>PHY 23102 General University Physics II</b>	5			■	<b>Fulfills Kent Core Basic Sciences</b>
Kent Core Requirement	3				
Kent Core Requirement	3				See Kent Core Summary on page 2
<b>Semester Three: [16 Credit Hours]</b>					
<b>CHEM 10060 General Chemistry I</b>	4			■	<b>Fulfills Kent Core Basic Sciences</b>
<b>CHEM 10062 General Chemistry I Laboratory</b>	1			■	<b>Fulfills Kent Core Basic Sciences</b>
<b>MATH 32051 Mathematical Methods in Physical Sciences I</b>	4	■		■	
Foreign Language (Elementary I)	4-5				Fulfills College General Requirements
Kent Core Requirement	3				See Kent Core Summary on page 2
<b>Semester Four: [16 Credit Hours]</b>					
<b>CHEM 10061 General Chemistry II</b>	4			■	<b>Fulfills Kent Core Additional</b>
<b>CHEM 10063 General Chemistry II Laboratory</b>	1			■	<b>Fulfills Kent Core Basic Sciences</b>
<b>MATH 32052 Mathematical Methods in the Physical Sciences II</b>	4	■		■	
<b>PHY 36001 Introductory Modern Physics</b>	3	■		■	
Foreign Language (Elementary II)	4-5				Fulfills College General Requirements
<b>Semester Five: [15 Credit Hours]</b>					
<b>CS 13001 Computer Science I: Programming and Problem Solving</b>	4			■	
<b>PHY 35101 Classical Mechanics</b>	4	■		■	
<b>PHY 36002 Application of Modern Physics</b>	3	■		■	
<b>PHY 45201 Electromagnetic Theory</b>	4	■		■	
<b>Semester Six: [14 Credit Hours]</b>					
<b>PHY 22564 Introduction to Materials Physics</b>	3			■	
<b>PHY 30020 Intermediate Physics Laboratory</b>	2	■		■	<b>Fulfills writing-intensive course requirement; see note 1 on page 2</b>
<b>PHY 45403 Data Analysis and Computational Physics Techniques</b>	3	■		■	
Kent Core Requirement	3				See Kent Core Summary on page 2
PHY Elective (lower or upper division)	3			■	See note 2 on page 2
<b>Semester Seven: [15 Credit Hours]</b>					
<b>PHY 32511 Electronics</b>	4	■		■	
<b>PHY 40092 Internship in Physics</b>	2	■		■	<b>See note 3 below; fulfills experiential learning requirement</b>
Kent Core Requirement	3				
Kent Core Requirement	3				See Kent Core Summary below
General Elective (lower or upper division)	3				



Critical requirements are boldface in shaded areas

Course Subject and Title	Credit Hours	Upper Div.	Min. Grade	Major GPA	Important Notes
<b>Semester Eight: [14 Credit Hours]</b>					
<b>PHY 40020 Advanced Physics Laboratory</b>	<b>2</b>	■		■	<b>Fulfills writing –intensive requirement; see note 1 below</b>
<b>PHY 45501 Electromagnetic Waves and Modern Optics</b>	<b>3</b>	■		■	
PHY Elective (upper division)	3	■		■	See note 2 below
Kent Core Requirement	2				See Kent Core Summary below
General Elective (lower or upper division)	4				Number of credits required depends on meeting minimum 121 credit hours and minimum 42 upper-division credit hours

### Graduation Requirements Summary

Minimum Total Hours	Minimum Upper-Division Hours	Minimum Kent Core Hours	Global / Domestic Diversity Course	Writing-Intensive	Experiential Learning	Minimum Major GPA	Minimum Overall GPA
121	42	36	Kent Core and General Electives	PHY 30020 or 40020	PHY 40092	2.000	2.000

### Kent Core Summary

Kent Core Categories	Important Notes	Remaining Credit Hours
<b>Composition (6-8 credit hours)</b> <i>ENG 11002, 11011, 21011; HONR 10197, 10297</i>	Enrollment based on placement test	6-8
<b>Mathematics and Critical Reasoning (3-5 credit hours)</b>	Fulfilled in this major with MATH 12002	0
<b>Humanities and Fine Arts (9 credit hours)</b> <i>Minimum one course from humanities in Arts and Sciences and minimum one course from fine arts</i>	May fulfill diversity requirement	9
<b>Social Sciences (6 credit hours)</b> <i>Must be selected from two curricular areas</i>	May fulfill diversity requirement	6
<b>Basic Sciences (6-7 credit hours)</b> <i>Must include one laboratory</i>	Fulfilled in this major with CHEM 10061, CHEM 10062, CHEM 10063, PHY 23101, PHY 23102	0
<b>Additional (6 credit hours)</b> <i>Must be selected from two Kent Core categories</i>	4 credits fulfilled in this major with CHEM 10060	2

**Note 1:** Students must earn a minimum C (2.0) grade in either PHY 30020 Intermediate Physics Laboratory or PHY 40020 Advanced Physics Laboratory to fulfill the writing-intensive requirement.

**Note 2:** **Physic electives (7 credit hours):** with advisor's permission, these courses may be replaced with physics-related electives selected from mathematics or the natural sciences.

**Note 3:** With advisor's permission, PHY 40092 may be replaced with PHY 40096 Individual Investigation or PHY 40099 Senior Honors Thesis. If PHY 40096 is taken, a suitable research project should be selected.

#### Additional Notes for the Physics major:

- The following courses **may not** count towards the major:

PHY 11030 Seven Ideas that Shook the Universe	3	PHY 21430 Frontiers in Astronomy	3
PHY 21040 Physics in The Entertainment and the Arts	3	PHY 21431 Frontiers in Astronomy Laboratory	1
PHY 21041 Physics in The Entertainment and the Arts Laboratory	1		

- Credit is not granted for both the PHY 13001/PHY 13002 and the PHY 23101/PHY 23102 series, nor for the PHY 13011/PHY 13012 series.

**Note:** All courses taken from the list of major program requirements are used in the calculation of the major GPA.

#### Kent Core

Students must complete a minimum 36 credit hours of the Kent Core. Certain courses required in programs and in student's major field may also fulfill the Kent Core. Honors equivalents shall satisfy the Kent Core. None of the courses on the Kent Core list may be taken with a pass/fail grade. Visit [www.kent.edu/catalog/kent-core](http://www.kent.edu/catalog/kent-core) for course list.

#### Diversity Course Requirement

Students must complete a two-course diversity requirement, consisting of one with a domestic (U.S.) focus and one with a global focus. One course must come from the Kent Core. The second course may be taken as a second Kent Core, within a major or minor, or as a general elective; or, with dean's approval, by completing one semester of study in another country. Visit [www.kent.edu/catalog/diversity](http://www.kent.edu/catalog/diversity) for course list.



**Writing-Intensive Course Requirement**

Students must complete a one-course writing-intensive requirement in their major and earn minimum C (2.000) grade. Visit [www.kent.edu/catalog/wic](http://www.kent.edu/catalog/wic) for course list.

**Experiential Learning Requirement (ELR)**

To provide students with direct engagement in learning experiences that promote academic relevance, meaning and an understanding of real-world issues, students must complete this requirement at Kent State, either as a for-credit course or as a non-credit, non-course experience approved by the appropriate faculty member. Visit [www.kent.edu/catalog/elr](http://www.kent.edu/catalog/elr) for course list.

**Upper-Division Requirement**

Students must complete a minimum 39 upper-division (numbered 30000 to 49999) credit hours of coursework. Programs in the College of Arts and Sciences require a minimum of 42 hours of upper-division coursework.

**Foreign Language**

Visit [www.kent.edu/catalog/foreign-languages](http://www.kent.edu/catalog/foreign-languages) for course list.

