Roadmap: Physics - Applied Mathematics - Bachelor of Science
AS-BS-PHY-AMTH
College of Arts and Sciences
Department of Physics
Applied Mathematics Minor [AMTH]
College of Arts and Sciences
Department of Mathematical Sciences
Catalog year: 2014-2015

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

Critical	Course Subject and Title	Credit Hours	Upper Div.	Min. Grade	Major GPA	Type	Term Taken
Semester One [15 Credits]							
!	**CHEM 10060 General Chemistry I**	**4**			■	**KBS**	
!	**CHEM 10062 General Chemistry I Laboratory**	**1**			■	**KBS**	
!	**MATH 12002 Analytic Geometry and Calculus I** [1, 2]	**5**			■	**KMC**	
!	**PHY 12000 Introductory Physics Seminar**	**1**			■		
	US 10097 Destination Kent State: First Year Experience [3]	1					
	Kent Core Requirement	3					
Semester Two [15 Credits]							
!	**CHEM 10061 General Chemistry II**	**4**			■	**KBS**	
!	**CHEM 10063 General Chemistry II Laboratory**	**1**			■	**KBS**	
!	**MATH 12003 Analytic Geometry and Calculus II** [2]	**5**			■		
!	**PHY 23101 General University Physics I** [4]	**5**			■	**KBS**	
Semester Three [16 Credits]							
!	**CS 13001 Computer Science I-Programming and Problem Solving**	**4**			■		
!	**MATH 32051 Mathematical Methods in the Physical Sciences I** [2]	**4**	■		■		
!	**PHY 23102 General University Physics II** [4]	**5**			■	**KBS**	
	General Electives [5]	3					
Semester Four [16 Credits]							
!	**MATH 32052 Mathematical Methods in the Physical Sciences II**	**4**	■		■		
!	**PHY 36001 Introductory Modern Physics**	**3**	■		■		
	Kent Core Requirement	3					
	Kent Core Requirement	3					
	General Electives [5]	3					
Semester Five [15 Credits]							
!	**PHY 35101 Classical Mechanics**	**4**	■		■		
!	**PHY 36002 Applications of Modern Physics**	**3**	■		■		
!	**PHY 45201 Electromagnetic Theory**	**4**	■		■		
	Foreign Language [6]	4 - 5					
Semester Six [15 Credits]							
!	**PHY 30020 Intermediate Physics Laboratory**	**2**	■	**C**	■	**WIC**	
!	**PHY 45403 Data Analysis and Computational Physics Techniques**	**3**	■		■		
	Foreign Language [6]	4 - 5					
	Kent Core Requirement	3					
	MATH elective [2, 8]	3			■		
Semester Seven [15 Credits]							
!	**PHY 40092 Internship in Physics** [9]	**2**	■		■	**ELR**	
!	**PHY 45401 Mathematical Methods in Physics**	**4**	■		■		
	Physics Electives	3	■		■		
	Kent Core Requirement	3					
	Kent Core Requirement	3					
Semester Eight [13 Credits]							
!	**PHY 40020 Advanced Physics Laboratory** [7]	**2**	■	**C**	■	**WIC**	
	MATH electives [2, 8]	3	■		■		
	Physics Electives	3			■		
	Kent Core Requirement	3					
	General Electives (1 credit hour must be upper division) [5]	2					

Graduation Requirements Summary

Minimum Total Hours	Minimum Upper-Division Hours	Minimum Kent Core Hours	Minimum	
			Major GPA	Overall GPA
120	42	36	2.000	2.000

1. MATH 11010 and 11022 may be bypassed with sufficient background.
2. Fulfills minor requirement
3. US 10097 is not required of transfer students with 25 credits or students age 21+ at time of admission.
4. 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.
5. Credit required depends on meeting minimum 120 credit hours and minimum 42 upper-division credit hours.

6. Fulfills College General Requirement.

7. A minimum C (2.000) grade must be earned in PHY 30020 or PHY 40020 to fulfill the writing-intensive requirement.

8. MATH Electives (6 credits)

Choose from the following: MATH electives[10]	
MATH 23022 Discrete Structures for Computer Science * (3)	MATH 31011 Discrete Mathematics * (3)
MATH 40011 Introduction to Probability Theory and Applications (3)	MATH 40012 Introduction to Statistical Concepts (3)
MATH 40041 Statistical Methods for Experiments (3)	MATH 40042 Sampling Theory (3)
MATH 40051 Topics in Probability Theory and Stochastic Processes (3)	MATH 41021 Theory of Matrices (3)
MATH 42011 Mathematical Optimization (3)	MATH 42031 Mathematical Models and Dynamical Systems (3)
MATH 42041 Advanced Calculus (3)	MATH 42045 Introduction to Partial Differential Equations (3)
MATH 42048 Introduction to Complex Variables (3)	MATH 42091 Seminar: Modeling Projects (3)
MATH 42201 Introduction to Numerical Computing I (3)	MATH 42202 Introduction to Numerical Computing II (3)

*Credit for both MATH 23022 and 31011 is not permitted.

9. 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.

10. There may be additional prerequisites required for some courses in the MATH elective list. See course catalog or department for more information. MATH electives must be approved by an advisor.

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 21040 Physics in The Entertainment and the Arts (3)
PHY 21041 Physics in The Entertainment and the Arts Laboratory (1)
PHY 21430 Frontiers in Astronomy (3)
PHY 21431 Frontiers in Astronomy Laboratory (1)

University Requirements Summary

Type	Categories	Course(s) Satisfying Category	Remaining Requirements
KCM	**Kent Core I. Composition** Enrollment based on placement test	visit www.kent.edu/catalog/kent-core	6
KMC	**Kent Core II. Mathematics and Critical Reasoning** Enrollment based on placement test	MATH 12002	fulfilled
KHU	**Kent Core III. Humanities** Minimum one course from humanities in Arts and Sciences; may fulfill diversity requirement	visit www.kent.edu/catalog/kent-core	3
KFA	**Kent Core IV. Fine Arts** Minimum one course from the fine arts; may fulfill diversity requirement	visit www.kent.edu/catalog/kent-core	3
KFH	**Kent Core V. Humanities or Fine Arts** One additional course from either the humanities or fine arts category, may fulfill diversity requirement.	visit www.kent.edu/catalog/kent-core	3
KSS	**Kent Core VI. Social Sciences** Must be selected from two curricular areas; may fulfill diversity requirement	visit www.kent.edu/catalog/kent-core	6
KBS	**Kent Core VII. Basic Sciences** Must include one laboratory	CHEM 10060, CHEM 10062, PHY 23101	fulfilled
KAD	**Kent Core VIII. Additional** May fulfill diversity requirement	CHEM 10061, CHEM 10063, PHY 23102	fulfilled
DD	**Domestic Diversity Course Requirement** Either domestic or global diversity must be from Kent Core	visit www.kent.edu/catalog/diversity	one course
DG	**Global Diversity Course Requirement** Either domestic or global diversity must be from Kent Core	visit www.kent.edu/catalog/diversity	one course
ELR	**Experiential Learning Requirement** Either course or non-course experience approved by the appropriate faculty member	PHY 40092	fulfilled
WIC	**Writing-Intensive Course Requirement** Minimum C (2.000) grade	PHY 30020 or PHY 40020	fulfilled