

<b>PROGRAM CODE</b> ULASPHYAS	<b>COLLEGE OF LIBERAL ARTS AND SCIENCES</b>			
<b>EFFECTIVE DATE</b> FALL 2020	<b>PHYSICS</b>			
<b>VERSION NUMBER</b> 2208	<i>BACHELOR OF SCIENCE</i>			
<b>ASTRONOMY TRACK</b>				
<b>STUDENT:</b>			<b>STUDENT ID NUMBER:</b>	

*MAJOR PROGRAM*

<b>Common Core</b>		
<b>COURSE</b>	<b>CR</b>	<b>GRADE</b>
PHY 100: PHYSICS I	4	
PHY 102: PHYSICS II	4	
PHY 212: MODERN PHYSICS	3	
PHY 220: ELECTRONICS	3	
PHY 230: OPTICS	3	
PHY 315: ADVANCED LAB	2	
PHY 380: SENIOR SEMINAR	2	
<b>TOTAL CREDITS</b>	<b>21</b>	

<b>Astronomy Track (Required)</b>		
<b>COURSE</b>	<b>CR</b>	<b>GRADE</b>
AST 140: PLANETARY SCIENCE	3	
AST 142: STELLAR & GALACTIC ASTRONOMY	3	
AST 242: EXOPLANETS	3	
AST 342 / PHY 342: ASTROPHYSICS	3	
PHY 245: MATHEMATICAL PHYSICS I	3	
PHY 312: CLASSICAL MECHANICS I	3	
PHY 316: ELECTROMAGNETISM I	3	
PHY 327: THERMO. AND STAT. MECH.	3	
<b>TOTAL CREDITS</b>	<b>24</b>	

<b>Astronomy Track (Electives)</b>		
STUDENTS MUST DISCUSS WITH THEIR ADVISORS WHICH ELECTIVES WOULD BEST SERVE THEIR FUTURE CAREER GOALS BEFORE CHOOSING THEM.		
<b>CHOOSE AT LEAST ONE (3 CREDITS)</b>	<b>CR</b>	<b>GRADE</b>
AST 205 / GEL 205: PLANETARY SURFACE PROCESSES	3	
AST 240: THE PLANETARIUM	3	
AST 350: PRACTICAL ASTRONOMY	3	
AST 370: RESEARCH IN ASTRONOMY	3	
PHY 214: INTRO. TO SUBATOMIC PHYSICS	3	
PHY 340: COMPUTATIONAL PHYSICS	3	
PHY 360: QUANTUM MECHANICS I	3	
<b>TOTAL CREDITS</b>	<b>3</b>	


*CONCOMITANT COURSES*

<b>Chemistry</b>		
<b>COURSE</b>	<b>CR</b>	<b>GRADE</b>
CHM 100: GENERAL CHEMISTRY I	*	
CHM 102: GENERAL CHEMISTRY II	4	
<b>Mathematics</b>		
MAT 181: CALCULUS I	*	
MAT 182: CALCULUS II	4	
MAT 283: CALCULUS III	4	
<b>Biology</b>		
BIO 104: PRINCIPLES OF BIOLOGY	*	
<b>TOTAL CREDITS</b>	<b>12</b>	

<b>Free Electives</b> <i>CHOOSE ANY COURSES THAT COUNT TOWARD GRADUATION</i>		
<b>COURSE</b>	<b>CR</b>	<b>GRADE</b>
	3	
	3	
	3	
	3	
	3	
<b>TOTAL CREDITS</b>	<b>15</b>	

NOTE:

\* REQUIRED FOR THE MAJOR. SATISFIES GENERAL EDUCATION REQUIREMENT OF UNDERSTANDING SCIENCE AND TECHNOLOGY

<b>GRADUATION REQUIREMENTS</b>						
		<b>REQUIRED</b>	<b>✓</b>		<b>REQUIRED</b>	<b>✓</b>
	GENERAL EDUCATION CREDITS	<b>42-45</b>		COMPREHENSIVE EXAM	<b>PASS</b>	
	PROGRAM CREDITS (MINIMUM)	<b>60</b>		MINIMUM QPA OVERALL	<b>2.0</b>	
	FREE ELECTIVE CREDITS	<b>15</b>		MINIMUM QPA IN MAJOR	<b>2.0</b>	
	TOTAL CREDITS	<b>120</b>				

NAME	
EFFECTIVE DATE FALL 2018 GENERAL EDUCATION VERSION 2188	

# KUTZTOWN

## UNIVERSITY

### DEGREE REQUIREMENTS

## GENERAL EDUCATION

### Student Learning Outcomes (SLO)

*Upon completion of the requirements for the General Education Program, students will be able to:*

- 1 communicate clearly and effectively orally and in writing.
- 2 apply scientific and quantitative reasoning to solve problems and increase knowledge.
- 3 apply skills in critical analysis and reasoning for the interpretation of data.
- 4 engage critically with creative or artistic works.
- 5 demonstrate the ability to retrieve, interpret, evaluate, and use information.
- 6 analyze the role of values, ethics, diversity, and multiple perspectives in local and global society.
- 7 demonstrate an understanding of various models for the development of the whole person.
- 8 explore concepts, ideas, and methods from a variety of disciplines.

*Use this checklist to plan your degree program. Meet every semester with your academic advisor to be sure that you are taking courses that are required to attain the degree you are seeking. Discuss your goals and choose courses that will help you to attain them. Get the most out of your education by taking advantage of everything that Kutztown University has to offer.*

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**TOTAL GENERAL EDUCATION CREDITS 42-45**

FIND A FULL EXPLANATION OF THE GENERAL EDUCATION PROGRAM AT [WWW.KUTZTOWN.EDU](http://WWW.KUTZTOWN.EDU)

<b>First Year Seminar: Discovering College</b>		CREDITS REQUIRED <b>3</b>	
THESE COURSES MEET SLO 5 & 7		CREDITS EARNED:	
COURSE NUMBER	COURSE NAME	GR	CR
FYS 100	First Year Seminar		
TRANSFER STUDENTS TRANSFERRING 30 CREDITS OR MORE AND NOT TRANSFERRING AN FYS OR FYE COURSE MAY SELECT ANY APPROVED GENERAL EDUCATION COURSE TO MEET THEIR FYS REQUIREMENT.			
TRANSFER ELECTIVE:			

A	<b>Communicating With And About the World</b>		CREDITS REQUIRED <b>12</b>	
	THESE COURSES MEET SLO 1 & 5		CREDITS EARNED:	
COURSE NUMBER	COURSE NAME	GR	CR	
1	COMPOSITION 100 LEVEL CMP 1__			
2	COMPOSITION 200 LEVEL CMP 2__			
3	SPEAKING			
4	ANY WRITING (A2) OR SPEAKING COURSE (A3) OR FROM THE APPROVED LIST			

COURSES IN CATEGORIES B, C & D MUST BE TAKEN OUTSIDE THE STUDENT'S MAJOR. THE MAJOR IS DEFINED AS THE PREFIX THAT IDENTIFIES THE MAJOR. CONCOMITANT REQUIREMENTS MAY BE TAKEN TO MEET GENERAL EDUCATION REQUIREMENTS.

B	<b>Understanding Self &amp; Others</b>		CREDITS REQUIRED <b>9</b>	
	THESE COURSES MEET SLO 3 & 6		CREDITS EARNED:	
COURSE NUMBER	COURSE NAME	GR	CR	
1				
2				
3				

C	<b>Understanding Science &amp; Technology</b>		CREDITS REQUIRED <b>9-12</b>	
	THESE COURSES MEET SLO 2 & 3		CREDITS EARNED:	
COURSE NUMBER	COURSE NAME	GR	CR	
1	SCIENTIFIC INQUIRY			
2	QUANTITATIVE REASONING			
3	ANY COURSE APPROVED FOR C1 OR C2			

D	<b>Understanding &amp; Creating Ideas</b>		CREDITS REQUIRED <b>9</b>	
	THESE COURSES MEET SLO 4 & 6		CREDITS EARNED:	
COURSE NUMBER	COURSE NAME	GR	CR	
1				
2				
3				

# B.S. in Physics (Astronomy Track) – Four-Year Plan<sup>1</sup>

(This document should not be considered as a substitute for the official program check sheet or a comprehensive discussion with your advisor. Also please refer to the program check sheet for all the footnotes, other guidelines, and requirements.)

## First Year

Fall			Spring		
Number	Title	Credits	Number	Title	Credits
PHY 100	Physics I	4	PHY 102	Physics II	4
MAT 181	Calculus I	4	MAT 182	Calculus II	4
CHM 100	General Chemistry I	4	CHM 102	General Chemistry II	4
FYS 100	<i>First Year Seminar</i>	3	AST 142	Stellar & Galactic Astronomy	3
<b>15</b>			<b>15</b>		

## Second Year

Fall			Spring		
Number	Title	Credits	Number	Title	Credits
PHY 212	Modern Physics	3	PHY 230	Optics	3
PHY 245	Mathematical Physics I	3	PHY 312	Classical Mechanics I	3
AST 140	Planetary Science	3		<i>Gen. Ed. or Elective</i>	3
MAT 283	Calculus III	4		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
<b>16</b>			<b>15</b>		

## Third Year

Fall			Spring		
Number	Title	Credits	Number	Title	Credits
PHY 220	Electronics	3	PHY 327	Thermo. & Stat. Mech.	3
PHY 316	Electromagnetism I	3		<i>Gen. Ed. or Elective</i>	3
AST 242	Exoplanets	3		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
<b>15</b>			<b>15</b>		

## Fourth Year

Fall			Spring		
Number	Title	Credits	Number	Title	Credits
PHY 380	Senior Seminar	2	PHY 315	Advanced Lab	2
AST 342	Astrophysics	3		<i>Gen. Ed. or Elective</i>	3
BIO 104	Principles of Biology	4		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
<b>15</b>			<b>14</b>		

### Gen. Ed. and Electives

A.1	
A.2	
A.3	
A.4	
B.1	
B.2	
B.3	
D.1	
D.2	
D.3	
Free Elective	
Free Elective	
Free Elective	
Free Elective	
Free Elective	
Astronomy Track Elective	

<sup>1</sup>**Courses in the Physics major are front-loaded in this plan.** It is designed with two groups of students in mind:

- Those who wish to go to graduate school in physics and want to complete most of the physics curriculum before taking the GRE-Physics Test in the Fall semester of their senior year
- Those who switch to Physics and wish to complete the major's courses in less than four years (assuming they have many gen. ed. and concomitant courses at the time of switch)

Others who wish to complete the required courses at a more even pace are urged to discuss a suitable course plan with their advisor.

## B.S. in Physics (Astronomy Track) – Four-Year Plan<sup>2</sup>

(This document should not be considered as a substitute for the official program check sheet or a comprehensive discussion with your advisor. Also please refer to the program check sheet for all the footnotes, other guidelines, and requirements.)

### First Year

Fall			Spring		
Number	Title	Credits	Number	Title	Credits
PHY 100	Physics I	4	PHY 102	Physics II	4
MAT 181	Calculus I	4	MAT 182	Calculus II	4
CHM 100	General Chemistry I	4	CHM 102	General Chemistry II	4
FYS 100	<i>First Year Seminar</i>	3	AST 142	Stellar & Galactic Astronomy	3
<b>15</b>			<b>15</b>		

### Second Year

Fall			Spring		
Number	Title	Credits	Number	Title	Credits
PHY 245	Mathematical Physics I	3	PHY 230	Optics	3
AST 140	Planetary Science	3	PHY 312	Classical Mechanics I	3
MAT 283	Calculus III	4		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
<b>16</b>			<b>15</b>		

### Third Year

Fall			Spring		
Number	Title	Credits	Number	Title	Credits
PHY 212	Modern Physics	3	PHY 327	Thermo. & Stat. Mech.	3
PHY 220	Electronics	3		<i>Gen. Ed. or Elective</i>	3
AST 242	Exoplanets	3		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
<b>15</b>			<b>15</b>		

### Fourth Year

Fall			Spring		
Number	Title	Credits	Number	Title	Credits
PHY 316	Electromagnetism I	3	PHY 315	Advanced Lab	2
PHY 380	Senior Seminar	2	BIO 104	Principles of Biology	4
AST 342	Astrophysics	3		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
	<i>Gen. Ed. or Elective</i>	3		<i>Gen. Ed. or Elective</i>	3
<b>14</b>			<b>15</b>		

### Gen. Ed. and Electives

A.1	
A.2	
A.3	
A.4	
B.1	
B.2	
B.3	
D.1	
D.2	
D.3	
Free Elective	
Free Elective	
Free Elective	
Free Elective	
Free Elective	
Astronomy Track Elective	

<sup>2</sup>Courses in the Physics major are distributed more uniformly over the four years in this plan. However, those who wish to take the GRE-Physics test in the Fall semester of their fourth year are encouraged to follow the expedited plan.