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University Registrar

College of SCIENCE
Department of PHYSICS
Bachelor of Arts in PHYSICS
Major in PHYSICS
Pre-Health Option
For student date of entry under UG Catalog 2022-2023

A hashtag (#) indicates a course with prerequisites or corequisites.

I. Pathways to General Education Requirements (49 credits)

Concept 1 Discourse (9 credits)

6 credits in foundational courses. The following course sequence is required of all students majoring in Physics within the B.A. Degree in Physics.

ENGL 1105 First-year Writing	3		ENGL 1106 First-year Writing	3	

3 credits in advanced or applied writing or speaking courses.

	3	

Concept 2 Critical Thinking in the Humanities (6 credits)

	3			3	

Concept 3 Reasoning in the Social Sciences (6 credits)

	3			3	

Concept 4 Reasoning in the Natural Sciences (8 credits) The following course sequence is required of all students majoring in Physics within the B.A. Degree in Physics.

# PHYS 2305-2306 Foundations of Physics	4			4	

Concept 5 Quantitative and Computational Thinking (11 credits)

8 credits in foundational courses. The following course sequence is required of all students majoring in Physics within the B.A. Degree in Physics.

MATH 1225 Calculus of a Single Variable	4		MATH 1226 Calculus of a Single Variable	4	

3 credits in advanced or applied courses. The following course is required of all students majoring in Physics within the B.A. Degree in Physics.

# MATH 2214 or # MATH 2214H Introduction to Differential Equations	3	

Concept 6 Critique and Practice in Design and the Arts (6 credits. 3 in design + 3 in arts, or 6 in integrated design & arts)

	3			3	

Concept 7 Critical Analysis of Identity and Equity in the United States (3 credits)

	3	

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II. Physics Bachelor of Arts Core Courses (21 credits)

# PHYS 2504 Mathematical Methods in Physics	3	
PHYS 3314 Intermediate Laboratory	3	
# PHYS 3324 Modern Physics	4	
# PHYS 3355 Intermediate Mechanics	3	
# PHYS 3405 Intermediate Electricity and Magnetism	3	
# PHYS 3704 Thermal Physics	3	
# PHYS 4315 Modern Experimental Physics	2	

III. Additional Required Courses for the Bachelor of Arts in Physics, Major in Physics, Pre-Health Option (13-14 credits)*

# PHYS 2325-2326 Seminar for Physics Majors	1		1	
# MATH 2114 Introduction to Linear Algebra **or** # MATH 2114H Introduction to Linear Algebra	3			
# MATH 2204 Introduction to Multivariable Calculus **or** # MATH 2204H Introduction to Multivariable Calculus	3			
# MATH 3214 Calculus of Several Variables	3			
CS 1064 Introduction to Programming in Python **or** CS 1114 Introduction to Software Design **or** # ECE 1574 Engr Problem Solving with C++ **or** # AOE/ESM 2074 Computational Methods	2 or 3			

*MATH 1225-1226 (#) and MATH 2214 (#) or MATH 2214H (#) and PHYS 2305-2306 (#) are also required of all Physics Majors within the B.A. Degree Program in Physics. They are listed in Section I above.

IV. Science Courses for the Physics Bachelor of Arts, Pre-Health Option (30 credits)

Physics (3 credits)		
# PHYS 4714 Introduction to Biophysics	3	

Biology (8 credits)				
BIOL 1005-1006 General Biology & BIOL 1015-1016 General Biology Laboratory	3 1		3 1	
or				
BIOL 1105-1106 Principles of Biology & # BIOL 1115-1116 Principles of Biology Laboratory	3 1		3 1	
or				
BIOL 1205H-1206H Honors Biology	4		4	

Chemistry (16 credits)				
# CHEM 1035-1036 General Chemistry	3		3	
# CHEM 1045-1046 General Chemistry Laboratory	1		1	
# CHEM 2535-2536 Organic Chemistry	3		3	
# CHEM 2545-2546 Organic Chemistry Laboratory	1		1	

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Statistics (3 credits)		
# STAT 3615 Biological Statistics	3	

V. Restricted Electives (one course from the list below, 3 credits)

# PHYS 3655 Introduction to Astrophysics	3	
# PHYS 3656 Introduction to Astrophysics	3	
# PHYS 4254 Quantum Information Technologies	3	
# PHYS 4264 Quantum Optics and Qubit Processors	3	
# PHYS 4514 Introduction to Nuclear Physics	3	
# PHYS 4554 Introduction to Solid State Physics	3	
# PHYS 4564 Polymer Physics	3	
# PHYS 4574 Nanotechnology	3	
# PHYS 4614 Optics	3	
# PHYS 4634 Modern Classical Physics	3	
# PHYS 4654 Modern Cosmology	3	
# PHYS 4674 Introduction to General Relativity	3	
# PHYS 4724 Soft Matter Physics	3	
# PHYS 4755 Introduction to Computational Physics	3	
# PHYS 4774 Introduction to Physics of Galaxies	3	

VI. Free Electives (3-4 credits)

Accepted Substitutions

PHYS 3355: AOE 3154 (Astromechanics), or ESM 3124 (Dynamics II Analytical and 3-D Motion).
PHYS 3405: ECE 3105 (Electromagnetic Fields).
PHYS 3314: AOE 3054 (AOE Experimental Methods), or ECE 2204 (Electronics) & ECE 2274 (Electronic Networks Laboratory I), or ESM 3444 (Mechanics Laboratory).

Foreign Language Requirement

Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six credits of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count toward the credits required for graduation. Please consult the Undergraduate Course Catalog for details.

Satisfactory Progress Toward Degree

A student will be certified as making satisfactory progress toward the B.A. degree in Physics by satisfying the university's academic eligibility requirements, as well as the following requirements:

- Upon having attempted 60 credit hours, the student will have completed Section I Concept 1 requirements, the Mathematics requirements (in Sections I and III) as well as PHYS 2305-2306 (Section 1 Concept 4), PHYS 2325-2326, PHYS 2504, and PHYS 3324.
- Upon having attempted 45 credit hours, the student must have 2.0 overall and in-major GPAs. All PHYS courses

attempted are used in the calculation of the in-major GPA. Non-PHYS courses used as Accepted Substitutions are not used in the calculation of the in-major GPA.

- Upon having attempted 72 credit hours, the student will have completed the foreign language requirement by the close of the academic year (spring semester). [College of Science requirement]
- Upon having attempted 96 credit hours, the student will have completed all credits for the Pathways to General Education.

Outcomes Assessment

Each student is required to participate in the department's Outcomes Assessment procedures as determined by each year's Undergraduate Program Committee and approved by the Department Chair.

Minimum hours and GPA required for graduation

A minimum of 120 credit hours must be completed for graduation. A minimum overall and in-major GPA of 2.0 is required for graduation. All PHYS courses attempted are used in the calculation of the in-major GPA. Non-PHYS courses used as Accepted Substitutions are not used in the calculation of the in-major GPA.

Prerequisites and Corequisites

Courses in this checksheet marked with a hashtag (#) have prerequisites or corequisites. Please check with your advisor or consult the Undergraduate Course Catalog.