<div align="center">

College of SCIENCE
Department of PHYSICS
Bachelor of Science in PHYSICS
Major in PHYSICS
For students graduating in calendar year 2022 and for student date of entry under UG Catalog 2020-2021

A hashtag (#) indicates a course with prerequisites or corequisites.
These are listed below.

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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.S. 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.S. Degree in Physics.

# CHEM 1035 General Chemistry	3		# CHEM 1036 General Chemistry	3	
# CHEM 1045 General Chemistry Lab	1		# CHEM 1046 General Chemistry Lab	1	

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.S. 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.S. 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	

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

Course	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 Science in Physics, Major in Physics (39-42 credits)*

Course	Credits			
# PHYS 2325-2326 Seminar for Physics Majors	1		1	
# PHYS 2305-2306 Foundations of Physics	4		4	
# PHYS 3356 Intermediate Mechanics	3			
# PHYS 3406 Intermediate Electricity & Magnetism	3			
# PHYS 4316 Modern Experimental Physics	2			
# PHYS 4455-4456 Introduction to Quantum Mechanics	3		3	
# MATH 2114 Introduction to Linear Algebra **or**	3			
# MATH 2114H Introduction to Linear Algebra				
# MATH 2204 Intro to Multivariable Calculus **or**	3			
# MATH 2204H Intro to Multivariable Calculus				
# MATH 3214 Calculus of Several Variables	3			
# MATH 4425 Fourier Series and Partial Differential Equations **or**	3			
# MATH 4564 Operational Methods for Engineers				
# MATH 3574 Applied Complex Variables (1 credits) **or**	1			
# MATH 4234 Elementary Complex Analysis (3 credits) **or**	or			
# MATH 4574 Vector and Complex Analysis for Engineers (3 credits)	3			
CS 1044 Introduction to Programming in C **or**	2			
CS 1054 Introduction to Programming in Java **or**	or			
CS 1064 Introduction to Programming in Python **or**	3			
CS 1114 Introduction to Software Design **or**				
# ECE 1574 Engr Problem Solving with C++ **or**				
# AOE/ESM 2074 Computational Methods				

* MATH 1225-1226 (#) and MATH 2214 (#) or # MATH 2214H (#) and CHEM 1035-1036 (#) and CHEM 1045-1046 (#) are also required of all Physics Majors within the B.S. Degree Program in Physics. They are listed in Section I above.

IV. Restricted Electives (two courses from the list below, 6 credits)

# PHYS 4254 Quantum Information Tech	3
# PHYS 4504 Intro Nuc Part Phys	3
# PHYS 4554 Intro Solid State Phy	3
# PHYS 4564 Polymer Physics	3
# PHYS 4574 Nanotechnology	3
# PHYS 4614 Optics	3
# PHYS 4654 Modern Cosmology	3
# PHYS 4674 Intro to General Relativity	3
# PHYS 4714 Intro to Biophysics	3
# PHYS 4755 Intro to Computational Physics	3
# PHYS 4774 Intro to Physics of Galaxies	3

V. Free Electives (2-5 credits)

	3			3
	3			3

Accepted Substitutions

PHYS 3355:   AOE 3154 (Astromechanics), **or** ESM 3124 (Dynamics II Analytical and 3-D Motion).

PHYS 3356:   ESM 3134 (Dynamics III Vibration and Control) **or** ESM 4114 (Nonlinear Dynamics and Chaos).

PHYS 3405:   ECE 3105 (Electromagnetic Fields).

PHYS 3406:   ECE 3106 (Electromagnetic Fields).

PHYS 3314:   AOE 3054 (AOE Experimental Methods), **or** ECE 2204 (Electronics) & ECE 2274 (Electronic Networks Laboratory I), **or** ESM 3444 (Mechanics Laboratory).

PHYS 4316:   PHYS 3154 (Observational Astrophysics).

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.S. 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 and Concept 4 requirements, the Mathematics requirements (in Sections I and III) as well as PHYS 2305-2306, PHYS 2504, and PHYS 3324.

- Upon having attempted 45 credit hours, the student must have 2.0 overall and in-major GPAs.

- Upon having attempted 96 credit hours, the student will have completed PHYS 3314, PHYS 3355-3356, and PHYS 3405-3406.

- 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 physics courses attempted are used in the calculation of the in-major GPA.

Prerequisites and Corequisites

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

List of prerequisites and corequisites

CHEM 1035-1036: Co: MATH 1025 or MATH 1225

CHEM 1045-1046: Co: CHEM 1035 for CHEM 1045; CHEM 1036 for CHEM 1046

PHYS 2504: Pre: 2305; Co: MATH 2214, MATH 2224, 2306

PHYS 3324: Pre: 2306; Co: MATH 2214, 2504

PHYS 3355: Pre: (MATH 1224 or MATH 2204 or MATH 2204H), (MATH 2214 or MATH 2214H), PHYS 2305, PHYS 2306, PHYS 2504

PHYS 3405: Pre: (MATH 2214 or MATH 2214H), PHYS 2305, PHYS 2306, PHYS 2504

PHYS 3704: Pre: 2306, 3324; Co: MATH 2214, 2504

PHYS 4315: Pre: 3314

PHYS 2305-2306: Pre: (MATH 1205 or MATH 1205H or MATH 1225) or (MATH 1206 or MATH 1206H or MATH 1226) for 2305; (MATH 1206 or MATH 1206H or MATH 1226), PHYS 2305 for 2306; Co: 2325 or (MATH 1206 or MATH 1206H or MATH 1226) for 2305

PHYS 2325-2326: Co: 2305 for 2325; 2306 for 2326

PHYS 3356: Pre: 3355 for 3356

PHYS 3406: Pre: 3405 for 3406

PHYS 4316: 4315 for 4316

PHYS 4455-4456: Pre: 3356 for 4455; 4455 for 4456; Co: 3406 for 4455

MATH 2114: Pre: MATH 1225 or MATH 1226

MATH 2114H: Pre: MATH 1225 or MATH 1226

MATH 2204: Pre: MATH 1226

MATH 2204H: Pre: MATH 1226

MATH 2214: Pre: (1114 or 2114 or 2114H or 2405H), 1226

MATH 2214H: Pre: (1114 or 2114 or 2114H or 2405H), 1226

MATH 3214: Pre: MATH 2224 or MATH 2224H or MATH 2204 or MATH 2204H or MATH 2406H or CMDA 2005

MATH 4425: Pre: 2406H or (CMDA 2005, CMDA 2006) or (MATH 2214 or MATH 2214H), (MATH 2224 or MATH 2224H or MATH 2204 or MATH 2204H), MATH 3224

MATH 4564: Pre: MATH (2214 or MATH 2214H) or MATH 2406H or CMDA 2006

MATH 3574: Pre: MATH 2204 or MATH 2204H or MATH 2224 or MATH 2224H

MATH 4234: Pre: MATH 3224

MATH 4574: Pre: MATH 2224 or MATH 2204 or MATH 2204H

ECE 1574: Pre: (ENGE 1024 or ENGE 1215 or ENGE 1414), MATH 1205 or (MATH 1205H or MATH 1225)

AOE 2074 (ESM 2074) 2 credit course: Pre: ENGE 1114 or ENGE 1216 or ENGE 1434

PHYS 4254: Pre: 2306, (MATH 2114 or MATH 2114H)

PHYS 4504: Co: 4456

PHYS 4554: Co: 4456

PHYS 4564: Pre: 2306

PHYS 4574: Pre: 2205, 2206 or 2305, 2306

PHYS 4614: Pre: 2306, MATH 2214, (MATH 2224 or MATH 2204 or MATH 2204H)

PHYS 4654: Pre: 3656

PHYS 4674: Pre: MATH 2214 or MATH 2214H or MATH 2514, PHYS 3356; Co: 3406

PHYS 4714: Pre: 2206 or 2306 or ISC 2106H

PHYS 4755: Pre: CS 1054 or CS 1064 or CS 1114 or ECE 1574 or AOE 2074 or ESM 2074

PHYS 4774: Pre: 3656