MAJOR IN INTERDISCIPLINARY PHYSICS - PHYSICS INNOVATION AND ENTREPRENEURSHIP CONCENTRATION

Requirements

(Beginning Spring 2025)

The#Interdisciplinary Physics major is designed for students with an interest in physics and its applications in other fields with high potential for employment and postgraduate opportunities. The program provides students#with a strong foundation in physics along with the freedom#to develop a coherent#academic#program across other disciplines such as computer science, mathematics, astronomy, geology, marketing, and entrepreneurship through concentrations in Computational Physics, Planetary Science and Physics Innovation and Entrepreneurship. The curricular pathways offered through the concentrations in the Interdisciplinary Physics major prepare students for careers in an increasingly technical workforce that values skills across many disciplines.

All Interdisciplinary Physics majors take a core set of physics courses, including a three-course sequence in fundamental classical physics and courses in computational methods, modern physics, and laboratory techniques. Students will be assigned an adviser in the Department of Physics, Astronomy, and Geosciences who will assist them in selecting elective courses within their program to best meet their career goals.

Required Courses for B.S. in Interdisciplinary Physics

Code	Title	Units
Required Physics Courses		
PHYS 185	INTRODUCTORY SEMINAR IN PHYSICS	1
PHYS 241	GENERAL PHYSICS I CALCULUS-BASED A grade of B or better in PHYS 211 is required to substitute for PHYS 241	4
or PHYS 211	GENERAL PHYSICS I; NON CALCULUS-BASED	
PHYS 242	GENERAL PHYSICS II CALCULUS-BASED	4
PHYS 243	GENERAL PHYSICS III	4
PHYS 305	COMPUTERS IN PHYSICS	4
PHYS 311	MODERN PHYSICS I	3
PHYS 341	INTERMEDIATE PHYSICS LABORATORY	3
PHYS 385	PHYSICS SEMINAR	1
or ASTR 385	ASTROPHYSICS SEMINAR	
or EPHY 385	ENGINEERING PHYSICS SEMINAR	
PHYS 486	PHYSICS SEMINAR II	1
Non-Physics Requirements		
MATH 273	CALCULUS I	4
MATH 274	CALCULUS II	4
Total Units		**33**

Students choosing the Physics Innovation and Entrepreneurship Concentration will be prepared to pursue start-up opportunities or technical sales and marketing positions that require a combination of scientific knowledge and skills in business and communications. Students in this concentration must declare a minor in Entrepreneurship or Marketing which is included in the coursework below.

Code	Title	Units
Additional Physics Content Requirements		
EPHY 155	ENGINEERING DESIGN FOR SOCIETY	3
EPHY 335	ANALOG ELECTRONICS	4
or EPHY 337	DIGITAL ELECTRONICS	
or PHYS 361	OPTICS FUNDAMENTALS	
PHYS 312	MODERN PHYSICS II	3
ELECTIVES	PHYS or EPHY 300- or 400-level	9
Additional Non-Physics Content Requirements		
COMM 131	PUBLIC SPEAKING	3
ECON 201	MICROECONOMIC PRINCIPLES	3
ENGL 317	WRITING FOR BUSINESS AND INDUSTRY	3
or BUSX 301	BUSINESS COMMUNICATIONS	
LEGL 225	LEGAL ENVIRONMENT OF BUSINESS	3
MKTG 341	MARKETING AND CREATIVITY	3
Required ENTR or MKTG minor		**12-15**
Total Units		**46-49**

Four-Year Plan of Study
Sample Four-Year Plan

The selected course sequence below is an example of the simplest path to degree completion. Based on course schedules, student needs, and student choice, individual plans may vary. Students should consult with their adviser to make the most appropriate elective choices and to ensure that they have completed the required number of units (120) to graduate.

Concentration in Physics Innovation and Entrepreneurship with Entrepreneurship Minor

Freshman

Term 1	Units	Term 2	Units
PHYS 185	1	PHYS 241 (Core 7)	4
MATH 273 (Core 3)	4	Core 2 (or Core 1)	3
Core 1 (or Core 2)	3	Core 10	3
Elective	4	Elective	4
Elective	3		
	15		**14**

Sophomore

Term 1	Units	Term 2	Units
MATH 274	4	PHYS 242 (Core 8)	4
EPHY 155 (Core 4)	3	ECON 201 (Core 6)	3
ENTR 110	3	ENTR 310	3
ENTR 305	3	MKTG 341	3
Elective	3	Elective	3
	16		**16**

Junior

Term 1	Units	Term 2	Units
PHYS 305	4	PHYS 243	4
COMM 131 (Core 5)	3	PHYS 385	1
ENGL 317 (Core 9)	3	ENTR 355	3
Physics Elective	3	LEGL 225 (Core 11)	3
		Elective	3
	13		**14**

Senior

Term 1	Units	Term 2	Units
PHYS 311	3	PHYS 312	3
PHYS 341	3	EPHY 335	4
PHYS 486	1	ENTR 410	3
Physics Elective	3	Physics Elective	3
Core 12	3	Core 14	3
Core 13	3		
	16		**16**

Total Units 120

Concentration in Physics Innovation and Entrepreneurship with Marketing Minor

Freshman

Term 1	Units	Term 2	Units
PHYS 185	1	PHYS 241 (Core 7)	4
MATH 273	4	Elective	4
Core 1 (or Core 2)	3	Core 2 (or Core 1)	3
Elective	4	Core 10	3
Elective	3		
	15		**14**

Sophomore

Term 1	Units	Term 2	Units
COMM 131 (Core 5)	3	PHYS 242 (Core 8)	4
EPHY 155 (Core 4)	3	ECON 201 (Core 6)	3
MATH 274	4	MKTG 341	3
MKTG 350	3	MKTG 425	3
Elective	3	Elective	3
	16		**16**

Junior

Term 1	Units	Term 2	Units
PHYS 305	4	PHYS 243	4
Physics Elective	3	PHYS 385	1
ENGL 317 (Core 9)	3	LEGL 225 (Core 11)	3
MKTG 451	3	MKTG 445	3
		Elective	3
	13		**14**

Senior

Term 1	Units	Term 2	Units
PHYS 311	3	PHYS 312	3
PHYS 341	3	EPHY 335	4
PHYS 486	1	Physics Elective	3
Physics Elective	3	Marketing Elective	3
Core 12	3	Core 14	3

Core 13		3	
	16		**16**

Total Units 120

Learning Outcomes

The IP program has two overarching student learning outcomes. Upon successful completion of the degree, students in all IP concentrations will be able to:

1. Demonstrate an understanding of fundamental principles of physics and major concepts in a student's chosen concentration and be able to apply these principles to solve quantitative problems.
2. Communicate scientific information effectively in both oral and written formats.
3. Demonstrate an understanding of the interdisciplinary nature of scientific research and technology as they apply to the fields of business, entrepreneurship, and physics.