

SCHOOL OF ARTS AND SCIENCES

PHYSICS

Faculty

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Program Goals

- Students should develop a good functional understanding of physics, including mechanics, electricity and magnetism, quantum physics, statistical mechanics, thermodynamics, optics, and relativity.
- Students should develop expert-like problem-solving skills.
- Students should develop critical thinking and reasoning skills.
- Students should develop laboratory skills.
- Students should develop technology skills.
- Students should improve their communication, interpersonal, and questioning skills.
- Students should develop and/or retain cognitive attitudes and beliefs (expectations) favorable for learning physics with deep understanding.
- Students should gain an understanding of the importance of collaborating with peers.
- Students should develop a personal awareness regarding bias in science.

Objectives

The Physics Program offers an academic major leading to the Bachelor of Science Degree. In addition, the program offers an academic and a teaching minor in physics. A Physical Science composite major is offered for students seeking a physical science composite endorsement for secondary education. The program is designed to meet the needs of (1) students intending to specialize in physics and pursue graduate work in physics, engineering, material science, or biophysics; (2) students preparing for a professional career in science and engineering; (3) students desiring to broaden their knowledge of the natural world; and (4) students who wish to teach at the secondary level.

Program Requirements

Students choosing a double major or minor within the science program may not apply electives to more than one major or minor. Only classes listed under "required courses" that coincide between both majors/minors may be applied to both.

Students must maintain a cumulative 2.3 GPA or better in courses required in the academic majors.

Students must meet the college-wide graduation requirements in addition to the Physics major:

- 124 total hours
- 30 upper division hours
- WCore or Honors College requirements

Physics Major

To fulfill the requirements for a major in Physics, students must complete the following as well as demonstrate competency in MATH 144:

Requirement Description	CH	PREQ
I. World Language Requirement	8	
Physics majors must complete eight credit hours in a single world language.		
II. Lower Division Physics Courses	8	
PHYS 211 Physics for Scientists and Engineers I and Lab 4 MATH 144, co-requisite: MATH 201		
PHYS 212 Physics for Scientists and Engineers II and Lab 4 PHYS 211, co-requisite: MATH 202		
III. Upper Division Physics Courses	28	
PHYS 301 Introduction to Modern Physics 4 PHY 151 or PHYS 212		
PHYS 309 Mathematical Methods for Physics 4 MATH 202, PHYS 211		
PHYS 311 Analytical Mechanics - offered fall of even years 4 MATH 203, PHYS 212, 309		
PHYS 370 S Scientific Computing 4 PHYS 211, or PHYS 151 and MATH 201 or equivalent		

Requirement Description	CH	PREQ
PHYS 411 Thermodynamics and Statistical Mechanics 4 CHEM 112, Math 202, PHYS 212, 309 PHYS 425 Quantum Physics - offered spring of even years 4 PHYS 212, 301, 309 and MATH 203, 204, or 211 PHYS 431 Electrodynamics - offered spring of odd years 4 PHYS 212, 309, MATH 203, and either MATH 204, MATH 211, or WCSAM 203		
IV. Electives	4	
Take one of the following courses: PHYS 305 Optics - offered fall of odd years 4 PHYS 152 or 212; MATH 202 PHYS 315 Electronics and Electric Circuits - offered fall of even years 4 PHYS 212, MATH 202 PHYS 410 Quantum Chemistry - offered fall of odd years 4 CHEM 112, MATH 202, PHYS 212, 309		
V. Required Courses from Other Programs	26	
CHEM 111 Principles of Chemistry I and Lab 4 co-requisites: CHEM 111R recommended/MATH 144 required CHEM 112 Principles of Chemistry II and Lab 4 CHEM 111 MATH 201 Calculus I 4 MATH 144 or placement test MATH 202 Calculus II 4 MATH 201 or placement test MATH 203 Multivariate Calculus 4 MATH 202 WCSAM 203 Linear Algebra 4 WCSAM 400 Science Capstone 2		
Total Hours for the Physics Major	74	

***Note:** MATH 311 and 363 are highly recommended.

Recommended Plan of Study for Physics

Listed below is a suggested plan of study for completing the physics requirements. Students should check with their advisors at least once a year as course offerings may change from what is listed. Students must also meet college wide requirements for graduation.

* Assumes student already has credit for MATH 144

**Course offered every other year, so Junior and Senior year may be interchanged.

Physics Minor

Requirement Description	CH	PREQ
I. Required Courses	20	
CHEM 111 Principles of Chemistry I and Lab 4 co-requisites: CHEM 111R recommended/MATH 144 required CHEM 112 Principles of Chemistry II and Lab 4 CHEM 111 PHYS 211 Physics for Scientists and Engineers I and Lab 4 MATH 144, co-requisite: MATH 201 PHYS 212 Physics for Scientists and Engineers II and Lab 4 PHYS 211, co-requisite: MATH 202		

Requirement Description	CH	PREQ
PHYS 301 Introduction to Modern Physics 4 PHY 151 or PHYS 212		
II. Electives	4	
Additional coursework in Physics selected from courses numbered 300 or above 4		
Total Hours for the Physics Minor	24	