



UNIVERSITY OF COLORADO
AT COLORADO SPRINGS
COLLEGE OF LETTERS, ARTS
AND SCIENCES

Department of Physics

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Objectives:

- ◆ Physicists seek answers to fundamental questions of a more applied nature: What is the origin of the universe and how will it evolve? How can we make faster solid state devices? How do the new high temperature superconductors work?
- ◆ This combination of the fundamental, the applied, and the broad range of topics makes physics a fascinating field of study with a broad range of employment opportunities for physics and energy science graduates. Some of the fields our graduates are working in are astrodynamics, optical memory storage, semiconductor physics, and computer modeling.

Energy Science Option (B.S.) – 52 credits, 29 upper division	<u>Credits</u>
Core Requirements:	
PES 111, 116 General Physics I and Lab OR PES 171, 116 Honors Physics I and Lab	5
PES 112, 216 General Physics II and Lab OR PES 172, 216 Honors Physics II and Lab	5
PES 213 General Physics III	3
PES 313, 315 Modern Physics and Lab	5
PES 317 Instrumentation Laboratory I	2
PES 318 Instrumentation Laboratory II	2
PES 321 Classical Mechanics I	3
PES 331 Electricity and Magnetism I	3
PES 341 Thermodynamics and Statistical Mechanics	3
PES 481 Senior Physics Seminar	2
Energy Science Option Requirements:	
PES 250 Introduction to Energy Science	3
ECON101 Microeconomics	3
GEOL101 Physical Geology + Lab	4
Three Technical Electives from:	
PES 332 Electricity and Magnetism II	3
PES 361 Solar Engineering Design	3
PES 365 Nuclear Phys. & Energy Tech.	3
PES 367 Wind Energy	3
PES 460 Advanced Solar Energy	3
GEOL312 Structural Geology I	3
GES 320 Practical Meteorology	3
GES 406 Intro to Remote Sensing	3
GES 409 Adv. Remote Sensing	3
<u>Auxiliary Requirements</u>	
MATH 135, 136 Calculus I and II	8
MATH 235 Calculus III	4
MATH 340 Differential Equations	3
CS 105/106/107/115 Programming Language Course	3
CHEM 103, 106 General Chemistry I and II	10
ENGL 307 Technical & Business Report Writing <u>OR</u>	
ENGL 309 Technical Writing & Presentation	3
<u>General Education Requirements**</u>	
**Students are required as part of their general education requirements to complete courses in Oral Communication, Cultural Diversity, and Global Awareness. These courses are identified in the LAS section of the schedule of courses and in the bulletin.	
Composition Requirement	6
Humanities Area Requirement	
General	9
Core	3
Natural Science Area Requirement (10 hours satisfied by departmental requirements)	2
Social Science Area Requirement	12
General electives	<u>+ 5</u>
Total Credits - 45 upper division (300-400) level	120

MODEL DEGREE PROGRAM

PHYSICS (PES) Energy Science Option

The following four-year plan lists all the specific course requirements for the Bachelor of Science in Physics-Energy Science degree. The order in which these courses are taken may vary with course availability. **Students are responsible for completing all course prerequisites.** Please note that this is a *suggested* degree program; your program may vary.

Suggested First Year

FALL

- _____ ENGL131 Rhetoric & Writing I
(Prer. of ENGL099 or ACT 19+ or SAT 450+)*
- _____ MATH135 Calculus I-4 cr (Prer. MATH105 or
score of 10+ on Calc. Readiness Exam)
- _____ PES 111 **OR** 171 + 116 General Physics I + Lab-5 cr
(PES 171 requires permission from dept.) (Coreq. MATH135)
- _____ I D 101 Freshman Seminar OR General Elective
- TOTAL=15 credits**

SPRING

- _____ ENGL141 Rhetoric & Writing II
(Prer. of ENGL131 or ACT 29+ or SAT 650+)*
- _____ MATH136 Calculus II-4 cr (Prer. MATH135)
- _____ PES 112 **OR** 172 + 216 General Physics I + Lab-5 cr
(Prer. PES 111/PES 171; Coreq. MATH136)
- _____ General Humanities Elective
- TOTAL=15 credits**

Suggested Second Year

FALL

- _____ PES 213 General Physics III (Prer. PES 112
Coreq. MATH235)
- _____ Social Science Elective
- _____ MATH235 Calculus III-4 cr (Prer. MATH136)
- _____ CHEM103 General Chemistry I-5 cr
(Prer. 1 yr high school chemistry and 2 years high school math)
- TOTAL=15 credits**

SPRING

- _____ MATH340 Intro to Differential Equations
(Prer. MATH235)
- _____ PES 250 Energy Fundamentals (**SPRING ONLY**)
- _____ CHEM106 General Chemistry II-5 cr
(Prer. CHEM103 with grade of 'C' or higher)
- _____ PES 313 Modern Physics (Prer. PES 213)
- _____ Natural Science Elective-2 cr
- TOTAL=16 credits**

Suggested Third Year

FALL

- _____ ENGL307/309 Technical Writing Course
(Prer. ENGL131)
- _____ PES 317 Instrumentation Lab I-2 cr (**FALL ONLY**) (Prer. PES 215)(Prer. PES 213; Coreq. MATH235)
- _____ PES 331 Principles of Electricity and Magnetism I
(**FALL ONLY**) (Prer. PES 213 and MATH235)
- _____ PES 315 Modern Physics Lab-2 cr (**FALL ONLY**)
- _____ GEOL 101 Physical Geology + Lab-4 cr
- TOTAL=14 credits**

SPRING

- _____ PES 318 Inst Lab II-2 cr (**SPRING ONLY**) (Prer. PES 215)
- _____ PES 321 Classical Mechanics I (**SPRING ONLY**)
- _____ PES 341 Thermodynamics and Statistical Mechanics
(**SPRING ONLY**) (Prer. PES 313)
- _____ Technical Elective from list (Prer. may apply)
- _____ Social Science Elective
- TOTAL=14 credits**

Suggested Fourth Year

FALL

- _____ Technical Elective from list (Prer. may apply)
- _____ ECON101 Microeconomics
- _____ PES 481 Senior Physics Seminar (O)-2 cr (**FALL ONLY**)
(Prer. senior status)
- _____ CS Programming Language Course (Prer. may apply)
- _____ Social Science Elective
- _____ General Elective-2 cr
- TOTAL=16 credits**

SPRING

- _____ Technical Elective from list (Prer. may apply)
- _____ HUM300+ Core Humanities (Prer. of junior status)
- _____ Social Science Elective
- _____ General Humanities Elective
- _____ General Humanities Elective
- TOTAL=15 credits**

All courses are 3 credits unless otherwise stated.

*ACT/SAT placement scores are based on the English section of the exam only.

Courses fulfilling General Humanities, Social Sciences and Natural Sciences, as well as the Global Awareness (G), Cultural Diversity (D) and Oral Communication (O) requirements, may be found in the Bulletin or the current schedule.

Electives may be used toward a minor, a 2nd major, prerequisites, additional courses in Physics (up to 54 credits maximum) or just for fun!