



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.

Solid State Physics Option (B.S.) -- 53 credits, 34 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
Solid State Option Requirements:	
PES 325 Mathematical Methods of Physics	3
PES 332 Electricity and Magnetism II	3
PES 415 Solid State Laboratory	2
PES 425 Quantum Mechanics	3
PES 446 Solid State Physics	3
Two Technical Electives from:	
PES 426 Quantum Mechanics II	6
PES 448 Surface & Interface Physics	
PES 449 Physics of Thin Films	
CHEM301 Materials Science I	
CHEM451 Physical Chemistry I	
CHEM452 Physical Chemistry II	
ECE2410 Logic Circuits	
ECE2420 Logic Circuits Lab	
ECE4020 Intro to Semiconductor Devices	
MATH381 Probability Theory	
MATH445 Complex Variables	
MATH447 Partial Diff. Equations	
C S 316 Programming Languages	
C S 460 Numerical Computing	
C S 472 Design & Analysis of Algorithms	
<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 Tech & Business Report Writing OR ENGL 309 Tech 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>+ 4</u>
Total Credits - 45 upper division (300-400) level	120

MODEL DEGREE PROGRAM

PHYSICS (PES)

Solid State Option

The following four-year plan lists all the specific course requirements for the Bachelor of Science in Physics-Solid State 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)
- _____ CS Programming Language Course (Prer. may apply)
- _____ 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) (**SPRING ONLY**) (Prer. PES 331)
- _____ PES 331 Principles of Electricity and Magnetism I
(**FALL ONLY**) (Prer. PES 213 and MATH235)
- _____ PES 315 Modern Physics Lab-2 cr (**FALL ONLY**)
- _____ General Humanities Elective
- _____ Technical Elective from list (Prer. may apply)
- TOTAL=16 credits**

SPRING

- _____ PES 318 Inst Lab II-2 cr (**SPRING ONLY**) (Prer. PES 215)
- _____ PES 332 Principles of Electricity and Magnetism II
- _____ PES 341 Thermodynamics and Statistical Mechanics
(**SPRING ONLY**) (Prer. PES 313)
- _____ PES 321 Classical Mechanics I (**SPRING ONLY**)
(Prer. PES 213; Coreq. MATH235)
- _____ Social Science Elective
- TOTAL=14 credits**

Suggested Fourth Year

FALL

- _____ PES 325 Mathematical Methods of Physics
and Engineering (**FALL ONLY**)
- _____ PES 425 Quantum Mechanics (**FALL ONLY**) (Prer. PES 313)
- _____ PES 481 Senior Physics Seminar (O)-2 cr (**FALL ONLY**)
(Prer. senior status)
- _____ General Humanities Elective
- _____ Social Science Elective
- TOTAL=14 credits**

SPRING

- _____ PES 446 Solid State Physics (**SPRING ONLY**)
(Prer. PES 313)
- _____ PES 415 Solid State Laboratory-2 cr (**SPRING ONLY**)
(Prer. PES 215 and PES 313)
- _____ Technical Elective from list (Prer. may apply)
- _____ HUM300+ Core Humanities (Prer. of junior status)
- _____ Upper Division Social Science Elective
- _____ General Elective-1 cr
- 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!