Physics Major Requirements
Catalog Year: 2014-15
Degree: Bachelor of Arts
Physics Major Credit Hours: 42+

“PR” indicates a pre-requisite. “CO” indicates a co-requisite.

Courses within this major may also satisfy general education requirements. Please consult http://registrar.cofc.edu/general-edu for more information.

Required Courses

☐ PHYS 111 General Physics I (3) PR or CO: MATH 120 or equivalent or instructor permission; CO: PHYS 111L
☐ PHYS 111L General Physics I Lab (1) CO: PHYS 111

☐ PHYS 112* General Physics II (3) PR: PHYS 111 or HONS 157; CO or PR: MATH 220 or equivalent or instructor permission; CO: PHYS 112L
☐ PHYS 112L General Physics II Lab (1) CO: PHYS 112

☐ PHYS 230 Introduction to Modern Physics I (3) PR: PHYS 112 or HONS 158; CO or PR: MATH 211 or instructor permission

☐ PHYS 370 Experimental Physics (4) PR: PHYS 230 or instructor permission

☐ PHYS 419 Research Seminar (1) PR or CO: PHYS 370 or ASTR 377 or instructor and department chair permission

☐ PHYS 420** Senior Research (3) PR: PHYS 419 and instructor and department chair permission

OR

☐ PHYS 499** Bachelor’s Essay (1-6) PR: PHYS 419 or department chair permission. Credit will not be awarded for both PHYS 420 and PHYS 499.

Notes: * Upon completion of PHYS 101 with a grade of B or better and successful completion of MATH 120, a student may transfer to PHYS 112. **Credit will not be awarded for both PHYS 420 and PHYS 499.

☐ Select 11 credit hours from the following electives with department approval. Please note a maximum of 3 credit hours from each of the following groups are allowed (PHYS 381, PHYS 390 and PHYS 399) and (PHYS 260, PHYS 260L, PHYS 460L).

Physics Electives List

PHYS 203 Physics and Medicine (3) PR: PHYS 102, PHYS 102L or PHYS 112, PHYS 112L or HONS 158

PHYS 260 NASA Space Mission Design (2) PR: ASTR 130 or ASTR 306 or HONS 160 or GEOL 206 or PHYS 102 or PHYS 112 or HONS 158 or instructor permission; CO: PHYS 260L or 460L

PHYS 260L NASA Space Mission Design Laboratory (1) CO: PHYS 260

PHYS 298 Special Topics (1-3) PR: Instructor permission

PHYS 301 Classical Mechanics (3) PR: PHYS 112 or HONS 158 and MATH 323 or PHYS 272 or permission of instructor

PHYS 302 Classical Mechanics (3) PR: PHYS 301

PHYS 308 Atmospheric Physics (3) PR: PHYS 112, PHYS 112L or HONS 158 or instructor permission

PHYS 320 Intro to Electronics (4) PR: PHYS 102 and MATH 120 or PHYS 112 or HONS 158 or instructor permission

PHYS 331 Intro to Modern Physics II (3) PR: PHYS 230
PHYS 340  Photonics (4) PR: PHYS 112, PHYS 112L or HONS 158

PHYS 350  Energy Production (4) PR: CHEM 111, CHEM 111L; (PHYS 112, 112L or HONS 158) or (PHYS 102, 102L and MATH 120)

PHYS 381  Internship (1-4) PR: Coordinator and department chair permission

PHYS 390  Research (1-3; repeatable up to 6) PR: Department chair and instructor permission

PHYS 394  Digital Signal and Image Processing with Biomedical Applications (3) PR: PHYS 112 and 112L or HONS 158 and 158L; CO: PHYS 394L

PHYS 394L  Digital Signal and Image Processing with Biomedical Applications Laboratory (1) PR: PHYS 112 and 112L or HONS 158 and 158L; CO: PHYS 394

PHYS 396  Biophysics Model and Excitable Cells (3) PR: BIOL 111 or HONS 151 and PHYS 112 or HONS 158 or permission of instructor

PHYS 397  Research Experience Physics and Astronomy (0) PR: Only declared majors can take a Zero Credit Research course. Instructor and department chair permission required.

PHYS 399  Tutorial (3; repeatable up to 12) PR: Junior standing and department chair and instructor permission

PHYS 403  Introductory Quantum Mechanics (3) PR: PHYS 230 and MATH 323 or PHYS 272, or instructor permission

PHYS 405  Thermal Physics (3) PR: PHYS 230 and MATH 323 or PHYS 272, or instructor permission

PHYS 407  Introduction to Nuclear Physics (3) PR: PHYS 230 or instructor permission

PHYS 408  Introduction to Solid State Physics (3) PR: PHYS 230 and MATH 323 or PHYS 272, or instructor permission

PHYS 409  Electricity and Magnetism (3) PR: PHYS 112 or HONS 158 and MATH 323 or PHYS 272 or permission of instructor

PHYS 410  Electricity and Magnetism (3) PR: PHYS 409

PHYS 412  Special Topics (1-3) PR: Instructor permission

PHYS 415  Fluid Mechanics (3) PR: MATH 323 and PHYS 301 or instructor permission

PHYS 456  Air Pollution Meteorology (4) PR: PHYS 112, PHYS 112L or (PHYS 102, PHYS 102L and MATH 120) or HONS 158; CHEM 112, CHEM 112L or instructor permission

PHYS 457  Satellite Meteorology (3) PR: PHYS 308 or PHYS 456 or (PHYS 105 and PHYS 112, PHYS 112L) or (PHYS 105 and PHYS 102, PHYS 102L and MATH 120) or (PHYS 105 and HONS 158)

PHYS 458  Climate Change (4) PR: PHYS 112, PHYS 112L or HONS 158

PHYS 460L  NASA Space Mission Design Leadership Lab (1) PR: Instructor permission; CO: PHYS 260

Mathematics Requirement

☐ MATH 120  Introductory Calculus (4) PR: Placement or C or better in MATH 111

☐ MATH 220  Calculus II (4) PR: MATH 120 or HONS 115

☐ MATH 221  Calculus II (4) PR: MATH 220 or equivalent
Optional: Students may also select a concentration in Computational Neuroscience, Energy Production or Meteorology.

Notes:

- With department approval, completion with grades of at least “B” in PHYS 101/101L and PHYS 102/102L, together with MATH 120 and MATH 220 may be substituted for PHYS 111/111L and PHYS 112/112L.

- Suggested programs of study leading to graduate school in physics, astronomy, astrophysics, meteorology and engineering are available from the department.