Astronomy Major Requirements
Catalog Year: 2015-16
Degree: Bachelor of Arts
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) CO: PHYS 111L; PR or CO: MATH 120 or equivalent or instructor permission
- PHYS 111L General Physics I Lab (1) CO: PHYS 111 or instructor permission
- PHYS 112* General Physics II (3) PR: PHYS 111 and 111L; CO: PHYS 112L; CO or PR: MATH 220 or equivalent or instructor permission
- PHYS 112L General Physics II Lab (1) CO: PHYS 112 or instructor permission
- PHYS 230 Introduction to Modern Physics I (3) PR: PHYS 112 or HONS 158; CO or PR: MATH 221 or instructor permission
- PHYS 419 Research Seminar (1) PR or CO: PHYS 370 or ASTR 377 or instructor permission
- PHYS 420** Senior Research (3) PR: PHYS 419; instructor and department chair permission
- PHYS 499*** Bachelor's Essay (6) PR: PHYS 419 or department chair permission. Credit will not be awarded for both PHYS 420 and PHYS 499
- ASTR 231 Introduction to Astrophysics (3) PR: PHYS 112 or HONS 158

Note: * 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. *** With department approval, PHYS 499 may be substituted for PHYS 420.

Complete an additional 12 credit hours. At least 6 of the credit hours must be selected from:

- ASTR 205 Intelligent Life in the Universe (3) PR: None
- ASTR 306 Planetary Astronomy (3) PR: ASTR 231
- ASTR 311 Stellar Astronomy and Astrophysics (3) PR: ASTR 231 and MATH 221
- ASTR 312 Galactic and Extragalactic Astronomy (3) PR: ASTR 231 and MATH 221
- ASTR 377 Experimental Astronomy (4) PR: ASTR 231
- ASTR 413 Astrophysics (3) PR: PHYS 301 and MATH 323 or instructor permission
- PHYS 390 Research (ASTR topic required) (1-3, Repeatable up to 6) PR: Instructor and department chair permission
- PHYS 412 Special Topics (ASTR topic required) (1-3) PR: Instructor and department chair permission

Select an additional 6 credit hours from the following:

- ASTR 205* Intelligent Life in the Universe (3) PR: None
- ASTR 210 Black Holes in the Universe (3) PR: None
- ASTR 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: ASTR 260L or GEOL 260L or PHYS 260L or ASTR 460L or GEOL 460L or PHYS 460L
ASTR 260L NASA Space Mission Design Lab (1) CO: ASTR 260
OR
ASTR 460L NASA Space Mission Design Leadership Lab (1) PR: Instructor permission; CO: ASTR 260

ASTR 306* Planetary Astronomy (3) PR: ASTR 231
ASTR 311* Stellar Astronomy and Astrophysics (3) PR: ASTR 231 and MATH 221
ASTR 312* Galactic and Extragalactic Astronomy (3) PR: ASTR 231 and MATH 221
ASTR 377* Experimental Astronomy (4) PR: ASTR 231
ASTR 410 Black Holes: Advanced Topics (1) PR: PHYS 112 or permission of instructor; CO: ASTR 210
ASTR 413* Astrophysics (3) PR: PHYS 301 and MATH 323 or instructor permission

GEOL 206 Planetary Geology (3) PR: GEOL 103 and 103L or HONS 155 and 155L; or permission of the instructor
GEOL 412 Crustal Geophysics (3) PR: GEOL 103 and 103L and GEOL 105 and 105L or HONS 155 and 155L and HONS 156 and 156L and MATH 120 and GEOL 352 or instructor permission

PHYS 301 Classical Mechanics (3) PR: (PHYS 112 or HONS 158) and (MATH 323 or PHYS 272) or permission of instructor
PHYS 340 Photonics (4) PR: PHYS 112, PHYS 112L or HONS 158, HONS 158L
PHYS 390* Research (ASTR topic required) (1-3, Repeatable up to 6) PR: Instructor and department chair 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 403 Introductory Quantum Mechanics (3) PR: PHYS 230 and (MATH 323 or PHYS 272) or instructor permission
PHYS 404 Introductory Quantum Mechanics (a continuation of PHYS 403) (3) PR: PHYS 403 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 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

Note: *When not used to fulfill the other above requirements.

Math Requirement

- MATH 120 Introductory Calculus (4) PR: C- or better in MATH 111 or placement
- MATH 220 Calculus II (4) PR: MATH 120 or HONS 115
- MATH 221 Calculus III (4) PR: MATH 220

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.