

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; PR or CO: 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*
- OR**
- 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) <i>CO: ASTR 260</i>
OR	
ASTR 460L	NASA Space Mission Design Leadership Lab (1) <i>PR: Instructor permission; CO: ASTR 260</i>
ASTR 306*	Planetary Astronomy (3) <i>PR: ASTR 231</i>
ASTR 311*	Stellar Astronomy and Astrophysics (3) <i>PR: ASTR 231 and MATH 221</i>
ASTR 312*	Galactic and Extragalactic Astronomy (3) <i>PR: ASTR 231 and MATH 221</i>
ASTR 377*	Experimental Astronomy (4) <i>PR: ASTR 231</i>
ASTR 410	Black Holes: Advanced Topics (1) <i>PR: PHYS 112 or permission of instructor; CO: ASTR 210</i>
ASTR 413*	Astrophysics (3) <i>PR: PHYS 301 and MATH 323 or instructor permission</i>
GEOL 206	Planetary Geology (3) <i>PR: GEOL 103 and 103L or HONS 155 and 155L; or permission of the instructor</i>
GEOL 412	Crustal Geophysics (3) <i>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</i>
PHYS 301	Classical Mechanics (3) <i>PR: (PHYS 112 or HONS 158) and (MATH 323 or PHYS 272) or permission of instructor</i>
PHYS 340	Photonics (4) <i>PR: PHYS 112, PHYS 112L or HONS 158, HONS 158L</i>
PHYS 390*	Research (ASTR topic required) (1-3, Repeatable up to 6) <i>PR: Instructor and department chair permission</i>
PHYS 394	Digital Signal and Image Processing with Biomedical Applications (3) <i>PR: PHYS 112 and 112L or HONS 158 and 158L; CO: PHYS 394L</i>
PHYS 394L	Digital Signal and Image Processing with Biomedical Applications Laboratory (1) <i>PR: PHYS 112 and 112L or HONS 158 and 158L; CO: PHYS 394</i>
PHYS 403	Introductory Quantum Mechanics (3) <i>PR: PHYS 230 and (MATH 323 or PHYS 272) or instructor permission</i>
PHYS 404	Introductory Quantum Mechanics (a continuation of PHYS 403) (3) <i>PR: PHYS 403 or instructor permission</i>
PHYS 405	Thermal Physics (3) <i>PR PHYS 230 and (MATH 323 or PHYS 272) or instructor permission</i>
PHYS 407	Introduction to Nuclear Physics (3) <i>PR: PHYS 230 or instructor permission</i>
PHYS 409	Electricity and Magnetism (3) <i>PR: (PHYS 112 or HONS 158) and (MATH 323 or PHYS 272) or permission of instructor</i>
PHYS 410	Electricity and Magnetism (3) <i>PR: PHYS 409</i>
PHYS 412*	Special Topics (1-3) <i>PR: Instructor permission</i>
PHYS 415	Fluid Mechanics (3) <i>PR: MATH 323 and PHYS 301 or instructor permission</i>

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.