The Minor in Astronomy requires the completion of 19 credit hours.

### I. Required courses (16 credit hours)

- PHYS 1055 Introduction to Astronomy 3
- PHYS 1056 Introduction to Astronomy 3
- PHYS 1155 Astronomy Laboratory 1
- PHYS 1156 Astronomy Laboratory 1
- PHYS 3154 Observational Astrophysics 2
- PHYS 3655 Introduction to Astrophysics 3
- PHYS 3656 Introduction to Astrophysics 3

Select 3 credit hours from the list below:

- PHYS 3355 Intermediate Mechanics 3
- PHYS 3405 Intermediate Electricity and Magnetism 3
- PHYS 4054 Introduction to Nuclear and Particle Physics 3
- PHYS 1156 Astronomy Laboratory 1 3
- PHYS 3405 Intermediate Electricity and Magnetism 3
- PHYS 4574 Nanotechnology 3
- PHYS 3154 Observational Astrophysics 2
- PHYS 3655 Introduction to Astrophysics 3
- PHYS 3656 Introduction to Astrophysics 3
- PHYS 4504 Introduction to Nuclear and Particle Physics 3
- PHYS 4614 Optics 3
- PHYS 4654 Modern Cosmology 3
- PHYS 4674 Introduction to General Relativity 3
- PHYS 4714 Introduction to Biophysics 3
- PHYS 4755 Intro to Computational Physics 3
- PHYS 4774 Intro to Physics of Galaxies 3
- BIOL 2134 Cell Function and Differentiation 3
- BIOL 2704 Evolutionary Biology 3
- GEOS 4154 Earthquake Seismology 3
- GEOS 4714 Volcanoes and Volcanic Processes 3
- AOE 3154 Astromechanics 3
- ECE 4114 Antennas 3
- ECE 4124 Radio Wave Propagation 3
- ECE 4144 Intro to Optical Information Processing 3
- ESM 3024 Introduction to Fluid Mechanics 3

Total 19 credit hours.

### II. Minimum GPA

For the courses attempted by the student for this minor, the student’s GPA must be 2.0 or higher.

### III. Accepted Substitutions

- PHYS 3355: AOE 3154 (Astromechanics), or ESM 3124 (Dynamics II Analytical and 3-D Motion).
- PHYS 3405: ECE 3105 (Electromagnetic Fields).

### IV. Prerequisites and/or Corequisites

For some of the courses listed above, prerequisites and/or corequisites apply. These are detailed below. Please check with your advisor or consult the Undergraduate Course Catalog.

#### List of prerequisites and corequisites

- PHYS 1155: Co: 1055
- PHYS 1156: Co: 1056
- PHYS 3154: Pre: 1156
- PHYS 3655: Pre: 2306
- PHYS 3656: Pre: 2306
- PHYS 3355: Pre: (MATH 1224 or MATH 2204 or MATH 2204H), (MATH 2214 or MATH 2214H), PHYS 2305, PHYS 2306, PHYS 2504
- PHYS 3405: Pre: (MATH 2214 or MATH 2214H), PHYS 2305, PHYS 2306, PHYS 2504
- PHYS 4504: Co: 4456
PHYS 4574: Pre: 2205, 2206 or 2305, 2306

PHYS 4614: Pre: 2306, MATH 2214, (MATH 2224 or MATH 2204 or MATH 2204H)

PHYS 4654: Pre: 3656

PHYS 4674: Pre: MATH 2214 or MATH 2214H or MATH 2514, PHYS 3356; Co: 3406

PHYS 4714: Pre: 2206 or 2306 or ISC 2106H

PHYS 4755: Pre: CS 1054 or CS 1064 or CS 1114 or ECE 1574 or AOE 2074 or ESM 2074

PHYS 4774: Pre: 3656

BIOL 2704: Pre: (BIOL 1005 or BIOL 1105 or BIOL 1205H or ISC 2105), (BIOL 1006 or BIOL 1106 or BIOL 1206H)

BIOL 2134: Pre: BIOL 2004

GEOS 4154: Pre: MATH 2204 or MATH 2204H, MATH 2214, PHYS 2305, GEOS 3104

AOE 3154: Pre: ESM 2304

ECE 4114: Pre: ECE 3106

ECE 4124: Pre: ECE 3106

ECE 4144: Pre: ECE 3105

ESM 3024: Pre: ESM 2304, (MATH 2224 or MATH 2204 or MATH 2204H)