

Minors in Physics, Astronomy & Astrobiology

Requirements for the Minor.

Minors in the College of Liberal Arts and Sciences are constructed with the following basic requirements: 18 hours in the minor field, with 12 of those hours required to be at a junior/senior level. The specific requirements for the physics minor, the astronomy minor, and the astrobiology minor follow:

The physics minor

PHSX 211 (or PHSX 213) General Physics I.....	4
PHSX 212 (or PHSX 214) General Physics II	4
PHSX 313 General Physics III	3
PHSX 316 Intermediate Physics Laboratory	1
PHSX 521 Mechanics I.....	3
PHSX 531 Electricity and Magnetism.....	3
Any PHSX course numbered 500 or above	3

21 credit hours, of which 13 are at the junior/senior level of work.

The astronomy minor

PHSX 211 (or PHSX 213) General Physics I.....	4
PHSX 212 (or PHSX 214) General Physics II	4
PHSX 313 General Physics III	3
PHSX 316 Intermediate Physics Laboratory	1
Astronomy and related field electives at the jr/sr level	8 or more

Students are strongly advised to take Astronomy 391 as their introductory course in astronomy; if students have already taken Astronomy 191 as an introductory astronomy course, they should inquire about taking 3 credit hours of Astronomy 390 instead. Be aware that Astronomy 591 and 592 are only taught in alternate years (Fall odd / Spring even semesters)

The astrobiology minor

The **Astrobiology Minor** is geared to students who are majors in a natural science discipline who want a broad background in the sciences supportive of research in astrobiology. It is administered by the Department of Physics & Astronomy. Research is a preferred part of the minor. KU faculty engaged in research in astrobiology include Anthony-Twarog, Medvedev, Melott, Murray, Wilson, Johnson (Chemistry), Lieberman (Geology), Mandel (Anthropology), and Martin (Natural History Museum).

Preparatory coursework should include:

MATH 121* - Calculus I	5*
or MATH 116 Calculus II.....	3
CHEM 184 Foundations of Chemistry I	5
	* preferred

Additional credits in astronomy, biology, chemistry, geology or physics (**ABCGP**) are required as follows:

BIOL 150 Principles of Molecular and Cellular Biology.....	4
GEOL 101 - Introduction to Geology, GEOL 105 - History of the Earth, or GEOL 121 - Prehistoric Life	3

ASTR 391 - Physical Astronomy.....	3
ASTR 394 - Extraterrestrial Life or 3 credits of undergraduate research in astrobiology.....	3
6 credits of coursework in ABCGP at the 300-level or higher and not in the student's major field.....	6

School of Business, concentration in physics

Students in the school of business may obtain a business degree with a concentration in physics as follows:

PHSX 211 (or PHSX 213) General Physics I.....	4
PHSX 212 (or PHSX 214) General Physics II	4
PHSX 313 General Physics III	3
PHSX 316 Intermediate Physics Laboratory	1
Junior/senior courses numbered 300 and above	11
for a total of 23 credits. Additional courses (18 credit hours) in mathematics are required:	
Math 121 or 141, Calculus I	5
Math 122 or 142, Calculus II	5
Math 223, Vector Calculus	3
Math 290, Linear Algebra	2
Math 320, Elementary Differential Equations	3

