BIOPHYSICS MINOR

Introduction

Please click here (http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/physics/) to see Physics department information.

The minor in biophysics enables students with primary interests in biology, chemistry, health sciences, mathematics, anthropology, psychology, or other disciplines to explore the deep connections between fundamental physical processes and the functions and development of life. Using mathematical and computational models as well as precise experimental measurements and advanced instrumentation, biophysics explores living processes within a framework that builds upon fundamental physics concepts of mechanics, electrodynamics, statistical physics, and quantum physics. Students taking a minor in biophysics will be able to synthesize some or all of these areas of physics at a mature level of understanding into their primary field(s) of study, bringing an enriched array of intellectual and experimental tools to the pursuit of their professional goals.

Students must consult with the physics advisor, meet physics faculty engaged in biophysics research, attend departmental biophysics-related seminars, and explore ways that biophysics relates to research undertaken by faculty in other disciplines - including both fundamental science and clinical medicine. Opportunities also arise to connect biophysics studies to outreach into regional high schools so that pre-college students can benefit from undergraduates sharing their experiences with connecting studies across disciplines.

These program requirements are subject to periodic revision by the academic department, and the College of Liberal Arts and Sciences reserves the right to make exceptions and substitutions as judged necessary in individual cases. Therefore, the College strongly urges students to consult regularly with their major, minor and CLAS advisors to confirm the best plans of study before finalizing them.

For more information, contact:

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Program Delivery

- This is an on-campus program.

Declaring This Minor

- Click here (http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/#policiestext) to go to information about declaring a minor.

General Requirements

Students must satisfy all requirements as outlined below and by the department offering the minor.

- Click here (http://catalog.ucdenver.edu/cu-denver/undergraduate/academic-policies-procedures/) for information about Academic Policies

Program Requirements

1. Students must complete a minimum of 16 PHYS credit hours.
2. Students must complete a minimum of six upper-division (3000-level and above) PHYS credit hours.
3. Students must earn a minimum grade of C- (1.7) in all courses that apply to the minor and must achieve a minimum cumulative minor GPA of 2.0. All graded attempts in required and elective courses are calculated in the minor GPA. Courses taken using P+/P/F or S/U grading cannot apply to minor requirements.
4. Students must complete a minimum of nine PHYS credit hours with CU Denver faculty.

Program Restrictions, Allowances and Recommendations

1. Requirements for the minor in biophysics may be used to fulfill the requirements of the major in physics.
2. A student majoring in physics who wants to minor in biophysics cannot use the 3000-level and above courses for the Biophysics minor for their Physics Major requirements.
3. A student seeking a minor in biophysics who also wants to minor in physics or astrophysics can only use one of the 3000-level and above courses applied to the Biophysics minor for their Physics Minor or Astrophysics Minor requirements.
4. Additional biophysics-related special topics or elective courses may be approved by the department advisor. Such courses include topics such as Radiation Physics in Biomedicine, Computational Modeling in Biophysics, Nonlinear Dynamics in Biomedicine, and specialized courses in biophysics-related instrumentation. Electives with a prefix other than PHYS may be considered in consultation with your departmental academic advisor and with approval of the physics department chair.

Code	Title	Hours
Complete the following Introductory Physics Lecture/Lab Courses:		*10*
PHYS 2010	College Physics I	
or PHYS 2311	General Physics I: Calculus-Based	
PHYS 2321	Intro Experimental Phys Lab I	
or PHYS 2351	Applied Physics Lab I	
PHYS 2020	College Physics II	
or PHYS 2331	General Physics II: Calculus-Based	
PHYS 2341	Intro Experimental Phys Lab II	
or PHYS 2361	Applied Physics Lab II	
Complete the following Upper Division Biophysics Courses:		*2*
PHYS 3151	Biophysics Outlook I	
PHYS 3161	Biophysics Outlook II	
Complete a minimum of four credit hours from the following Upper Division Biophysics Elective Courses:		*4*
PHYS 3251	Biophysics of the Body	

PHYS 3252	Biophysics of the Body NM	
PHYS 3451	Biophysics of the Cell [2]	
or PHYS 345	Biophysics of the Cell NM	
PHYS 3840	Independent Study: PHYS [3]	
PHYS 3880	Directed Research [3]	
PHYS 4351	Bioelectromagnetism [2]	
or PHYS 4352	Bioelectromagnetism NM	
PHYS 4840	Independent Study: PHYS [4]	
PHYS 4880	Directed Research [3]	
Total Hours		**16**

1. Need a minimum of four credits to satisfy the requirement that students must complete a minimum of six upper-division (3000-level and above) PHYS credit hours.
2. The courses containing "NM" are versions whose math and use of prior physics knowledge has been adjusted - in terms of grading and assignments - for students who have taken fewer math and physics courses than physics majors (NM stands for non-majors). Both versions are meant to be content rich and conceptually challenging, still require quantitative modeling, and are offered simultaneous by the same instructor. Students with strong math backgrounds are encouraged to take the "majors" (xx51) version. Either one or the other version can count toward the minor, but not both.
3. Repeatable. Max Credits: six.
4. Repeatable. Max Credits: 12.

To learn more about the Student Learning Outcomes for this program, please visit our website.