BIOPHYSICS, BACHELOR OF SCIENCE

Biophysics Major Requirements

Students must take all courses that are required for the major for a letter grade and earn a C or better.

(See also Requirements for a Bachelor's Degree (https://e-catalogue.jhu.edu/ksas-wse/undergraduate-policies/academic-policies/requirements-bachelors-degree/).)

Writing and Communication in the Major

Students are required to complete at least 6 credits of Writing and Communication foundational ability coursework. For the Biophysics major, students are able to fulfill this requirement by completing AS.250.383 Molecular Biophysics Laboratory, a required 3-credit course for the major, and by selecting a designated Writing and Communications course as one of their major electives, such as AS.250.411 Advanced Seminar in Structural Biology of Chromatin, AS.250.420 Advanced Seminar in Macromolecular Binding, AS.250.421 Advanced Seminar in Membrane Protein Structure, Function & Pharmacology, or AS.250.253 Protein Engineering and Biochemistry Lab.

Code	Title	Credits
Chemistry		
AS.030.101 & AS.030.105	Introductory Chemistry I and Introductory Chemistry Laboratory I	4
AS.030.102 & AS.030.106	Introductory Chemistry II and Introductory Chemistry Laboratory II	4
or AS.030.103	Applied Chemical Equilibrium and Reactivity w/lab	
AS.030.205	Introductory Organic Chemistry I	4
AS.030.206	Introductory Organic Chemistry II	4
or AS.030.212	Honors Organic Chemistry II	
Physics		
AS.171.101	General Physics: Physical Science Major I	4
or AS.171.103	General Physics I for Biological Science Majors	
or AS.171.105	Classical Mechanics I	
or AS.171.107	General Physics for Physical Sciences Majors (AL)	
AS.173.111	General Physics Laboratory I	1
or AS.173.115	Classical Mechanics Laboratory	
AS.171.102	General Physics: Physical Science Major II	4
or AS.171.104	General Physics/Biology Majors II	
or AS.171.106	Electricity and Magnetism I	
or AS.171.108	General Physics for Physical Science Majors (AL)	
AS.173.112	General Physics Laboratory II	1
or AS.173.116	Electricity and Magnetism Laboratory	
Mathematics		
AS.110.108	Calculus I (Physical Sciences & Engineering)	4
AS.110.109	Calculus II (For Physical Sciences and Engineering)	4
or AS.110.113	Honors Single Variable Calculus	
AS.110.202	Calculus III	4
or AS.110.211	Honors Multivariable Calculus	
One additional Math elective is required. See "Math List" below.		4
Biophysics		
AS.250.205	Introduction to Computing	3
AS.250.315	Biochemistry I	3
AS.250.372	Biophysical Chemistry	4
AS.250.381	Spectroscopy and Its Application in Biophysical Reactions	3
AS.250.383	Molecular Biophysics Laboratory (Writing Intensive)	3
Research (2 credits required) [1]		
AS.250.520	Introduction to Biophysics Research	3
Major Electives		
3 Courses from List 1, below		9-12
Total Credits		**70-73**

[1] All students will be expected to present their research in poster or oral format at the Biophysics Department Research Symposium in April. In most cases, students will present during their senior year. Research for credit in Intersession will not count towards this requirement.

Math List

Code	Title	Credits
Select one course from this list to fulfill the required Math Elective:		
AS.110.201	Linear Algebra	4
AS.110.212	Honors Linear Algebra	4
EN.553.211	Probability and Statistics for the Life Sciences	4
or EN.553.310	Probability & Statistics for the Physical Sciences & Engineering	
or EN.553.311	Intermediate Probability and Statistics	
EN.553.291	Linear Algebra and Differential Equations	4
Any 300 level course or higher with approval of faculty advisor		

List #1

Code	Title	Credits
Select three courses from this list to fulfill the required Major Electives:		
AS.250.206	Mathematical Methods for Biophysics	4
AS.250.253	Protein Engineering and Biochemistry Lab	3
AS.250.302	Modeling the Living Cell	4
AS.250.316	Biochemistry II	3
AS.250.405	Systems Genome Biology	3
AS.250.406	Quantitative Analysis of Cell Signaling	3
AS.250.411	Advanced Seminar in Structural Biology of Chromatin	3
AS.250.416	Biophysical Techniques and Their Applications	3
AS.250.420	Advanced Seminar in Macromolecular Binding	3
AS.250.421	Advanced Seminar in Membrane Protein Structure, Function & Pharmacology	3
AS.171.310	Biological Physics	4
AS.171.648	Physics of Cell Biology: From Mechanics to Information	3

Sample Program of Study

First Year

First Semester	Credits	Second Semester	Credits
AS.030.101	3	AS.030.102	3
AS.030.105	1	AS.030.106	1
AS.110.108	4	AS.110.109	4
AS.250.205	3		
	11		**8**

Second Year

First Semester	Credits	Second Semester	Credits
AS.030.205	4	AS.030.206	4
AS.110.202	4	AS.171.104	4
AS.171.103	4	AS.173.112	1
AS.173.111	1	Required Math Elective	4
	13		**13**

Third Year

First Semester	Credits	Second Semester	Credits
AS.250.315	3	AS.250.381	3
AS.250.372	4	Elective from List #1	3-4
		AS.250.520	3
	7		**9-10**

Fourth Year

First Semester	Credits	Second Semester	Credits
Elective from List #1	3-4	AS.250.383	3
		Elective from List #1	3-4
	3-4		**6-7**

Total Credits 70-73

Honors in Biophysics

The Jenkins Biophysics department offers outstanding students the opportunity to earn departmental honors in Biophysics. This honors distinction appears on the student's transcript upon graduation. If the honors requirements are approved prior to early April, an "Honors" distinction will additionally appear in the commencement program.

The requirements for departmental honors in Biophysics are twofold:

- The student must maintain an overall GPA of 3.5 or greater
- The student must write and receive approval of an Honors paper that is based on their 6 credits of required research.

Generally, the Honors paper must be submitted no later than March 20th of the senior year to meet the commencement deadline. Details on the format of the Honors paper can be found on the departmental website (students do not register for credit for the paper). Students should schedule a meeting with their Biophysics faculty advisor if they are interested in seeking departmental honors.

Ete Z. Szüts Undergraduate Research Travel Award

This award, named in honor of a Ph.D. graduate student from this department, will provide funds for up to 80 percent of the transportation costs of undergraduate research students in biophysics to attend a scholarly meeting. Recipients must be sponsored by a member of the departmental faculty who will be at the same meeting. Students should schedule a meeting with their Biophysics faculty advisor if they are interested in the Szuts Travel Award.

H. Keffer Hartline Award for Excellence in Undergraduate Research in Biophysics

This award honors a senior Biophysics Major for excellence in undergraduate research in Biophysics. Recipients are selected by Biophysics Faculty.

Detlev W. Bronk Award for Outstanding Scholarship in Biophysics

This award honors a senior Biophysics major for outstanding academic achievement in Biophysics. Recipients are selected by Biophysics Faculty.