

PHYSIOLOGY (BS)

Program Description

This major is designed for students intending to pursue postgraduate training in biology or health sciences. This major is particularly well suited for students pursuing pre-professional health training in medicine, dentistry, optometry, pharmacy, veterinary medicine, and other health-related careers.

Entering and Completing the Major

In order to earn a degree, you must complete at least one academic major. SPU encourages students to explore various academic paths, so if you change your mind about a major, or want to include an additional program, you are able to do so, as outlined below.

Note that the University encourages you to enter your chosen major(s) as soon as you have determined it and are eligible to join it, especially by the start of your junior year. Students who transfer as juniors and seniors should enter a major within their first two quarters at SPU.

- If this is your first quarter at SPU and you identified a major in this department as your first choice on your application for admission to the University, you have gained entry to the major. To change or add a major, follow these instructions (<https://spu.atlassian.net/l/cp/a3th1keb/>).
- If you are an SPU student with an SPU cumulative GPA of 2.0 or better, follow these instructions (<https://spu.atlassian.net/l/cp/a3th1keb/>) to enter a major in this department.
- The University requires a grade of C- or better in all classes that apply to a major; however, programs may require higher minimum grades in specific courses. You may repeat an SPU course only once for a higher grade.
- To advance in this program, meet with your faculty advisor regularly to discuss your grades, course progression, and other indicators of satisfactory academic progress. If your grades or other factors indicate that you may not be able to successfully complete the major or minor, your faculty advisor can work with you to explore options, which may include choosing a different major.
- You must complete the major requirements that are in effect in the SPU Undergraduate Catalog for the year you enter the major.

Physiology (BS)

102 Credits Minimum, Including 35 Upper Division (UD)

Code	Title	Credits
General Core Requirements		
BIO 2101	General Biology	5
BIO 2102	General Biology	5
BIO 2103	General Biology	5
BIO 3325	Genetics	5
BIO 3899	Scientific Literature	1
BIO 4352	Cell Biology	5
Section Credits Required		26
Physiology Core		
Select 5 credits of the following: ¹		5
BIO 4256	Environmental Physiology	
BIO 4410	Human Physiology	

BIO 4413	Animal Physiology	
BIO 4415	Plant Physiology	
BIO 4418	Neurobiology	
BIO 4419	Medical Virology	
Section Credits Required		5
Electives		
Select 10 credits of the following: ¹		10
BIO 3350	Immunology	
BIO 3351	General Microbiology	
BIO 3432	Biodiversity: Vertebrate Biology	
BIO 4320	Principles of Development	
BIO 4325	Molecular Biology	
BIO 4435	Biodiversity: Parasites and Pests	
CHM 4362	Biochemistry	
or CHM 4372 Biochemistry Lecture		
Section Credits Required		10
Ecology and Evolution Core		
Select one of the following:		5
BIO 3000	Introduction to Biological Anthropology	
BIO 3302	Coral Reef Ecology	
BIO 3303	Evolutionary Ecology in the Galapagos Islands	
BIO 3304	Oceanography of the Galapagos Archipelago	
BIO 3305	Marine Restoration Ecology	
BIO 3310	Ecology	
BIO 3453	Biodiversity: Plant Identification and Taxonomy	
BIO 4330	Evolutionary Mechanisms	
BIO 4744	Marine Botany	
BIO 4810	Marine Ecology	
BIO 4815	Aquatic Ecology	
BIO 4825	Forest Ecology	
BIO 4835	Conservation Biology	
BIO 4840	Chemical Ecology	
Section Credits Required		5
Capstone Experience		
Select one of the following Groups:		3
Group A:		
BIO 4615	Bioethics	
Group B:		
BIO 4978 & BIO 4979	Biological Research Proposal and Biological Research	
Section Credits Required		3
Required Supporting Courses		
CHM 1211	General Chemistry I	5
CHM 1212	General Chemistry II	5
CHM 1213	General Chemistry III	3
CHM 3371	Organic Chemistry I	5
CHM 3372	Organic Chemistry II	5
CHM 3373	Organic Chemistry III	5
CHM 4361	Biochemistry	5
MAT 2360	Introduction to Statistics for the Sciences	5
Section Credits Required		38
Additional Required Supporting Courses (select one group)		15

Group A:

PHY 1101	General Physics
PHY 1102	General Physics
PHY 1103	General Physics

Group B:

PHY 1121	Physics for Science and Engineering
PHY 1122	Physics for Science and Engineering
PHY 1123	Physics for Science and Engineering

Section Credits Required	15
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Recommended Courses

BIO 4360	Biostatistics
MAT 1234	Calculus I or MAT 1221 Survey of Calculus
PHI 1002	Ethics and the Good Life
PHI 2222	Social Ethics
PSY 1180	General Psychology: Individual in Growth
SOC 1110	Introduction to Sociology

Section Credits Required	0
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Total Credits	102
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Courses not used in Physiology Core may be used in Electives.

Additional Requirements and Information

- Max 6 credits from BIO 4900-4999 may be applied to major.

Suggested Course Sequence

This suggested course sequence is a potential plan for how to complete the major within four years. Please consult with a departmental faculty advisor for course advisement.

- Students should take Chemistry Placement test (available in Canvas) prior to New Student Advising.
 - A Chemistry Placement score ≥ 35 is a pre-requisite for BIO 2101 General Biology and CHM 1211 General Chemistry I.
- Students who score < 35 on the Chemistry Placement test, or who would benefit from an introduction to Chemistry, should take CHM 1000 Preparation for General Chemistry in Autumn quarter, then take BIO 2101 General Biology and CHM 1211 General Chemistry I in Winter quarter.
- Students interested in careers in health sciences should take PPHS 1200 Introduction to the Health Professions and PPHS 3400 Application Workshop. See the Pre-Professional Health Sciences program (<https://catalog.spu.edu/undergraduate/interdisciplinary-programs/pre-professional-health-sciences/>) website for more information.

Four-Year Plan: >35 on Chemistry Placement Test

Course	Title	Credits
First Year		
Autumn		
CHM 1211	General Chemistry I	5
UCOL 1000	University Colloquium	1
Credits		6

Winter		
BIO 2101	General Biology ¹	5
CHM 1212	General Chemistry II	5
PPHS 1200	Introduction to the Health Professions	1
Credits		11

Spring		
BIO 2102	General Biology	5
CHM 1213	General Chemistry III	3
Credits		8

Any Quarter		
WRI 1000	Academic Inquiry and Writing Seminar	5
WRI 1100	Disciplinary Research and Writing Seminar	5
UFDN 1000	The Christian Faith	5
Credits		15

Second Year		
Autumn		
BIO 2103	General Biology	5
CHM 3371	Organic Chemistry I	5
PHY 1101	General Physics or PHY 1121 or Physics for Science and Engineering	5
Credits		15

Winter		
CHM 3372	Organic Chemistry II	5
PHY 1102	General Physics or PHY 1122 or Physics for Science and Engineering	5
Credits		10

Spring		
CHM 3373	Organic Chemistry III	5
PHY 1103	General Physics or PHY 1123 or Physics for Science and Engineering	5
Credits		10

Any Quarter		
MAT 2360	Introduction to Statistics for the Sciences	5
Select five credits from the following: ²		5
MAT 1221	Survey of Calculus	
MAT 1234	Calculus I	
BIO 4360	Biostatistics	
Credits		10

Third Year		
Autumn		
CHM 4361	Biochemistry	5
Credits		5

Winter		
BIO 3325	Genetics	5
CHM 4362	Biochemistry ³ or CHM 4372 or Biochemistry Lecture	5
Credits		10

Spring		
Apply to graduate!		
Credits		0

Any Quarter		
BIO 3899	Scientific Literature	1
Select five credits of Physiology core courses selected from the following in years 3 - 4: ⁴		5
BIO 4256	Environmental Physiology	
BIO 4410	Human Physiology	
BIO 4413	Animal Physiology	
BIO 4415	Plant Physiology	
BIO 4418	Neurobiology	
BIO 4419	Medical Virology	
Select five credits of Ecology and Evolution Core courses selected from the following in years 3 - 4:		5

BIO 3000	Introduction to Biological Anthropology	
BIO 3302	Coral Reef Ecology	
BIO 3303	Evolutionary Ecology in the Galapagos Islands	
BIO 3304	Oceanography of the Galapagos Archipelago	
BIO 3305	Marine Restoration Ecology	
BIO 3310	Ecology	
BIO 3453	Biodiversity: Plant Identification and Taxonomy	
BIO 4330	Evolutionary Mechanisms	
BIO 4744	Marine Botany	
BIO 4810	Marine Ecology	
BIO 4815	Aquatic Ecology	
BIO 4825	Forest Ecology	
BIO 4835	Conservation Biology	
BIO 4840	Chemical Ecology	
Select ten credits of Electives from the following in years 3-4:		10
BIO 3350	Immunology	
BIO 3351	General Microbiology	
BIO 3432	Biodiversity: Vertebrate Biology	
BIO 4320	Principles of Development	
BIO 4325	Molecular Biology	
BIO 4435	Biodiversity: Parasites and Pests	
CHM 4362 or CHM 4372	Biochemistry or Biochemistry Lecture	
BIO 4978 & BIO 4979	Biological Research Proposal and Biological Research (in years 3-4) ⁵	3
Credits		24
Fourth Year		
Autumn		
BIO 4615	Bioethics ⁵	3
PPHS 3400	Application Workshop	2
Credits		5
Spring		
BIO 4352	Cell Biology	5
Credits		5
Total Credits		134

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Students who test at Math Placement Level B and who either score ≥ 45 on the Chemistry Placement Test or transfer in the complete General Chemistry sequence may take BIO 2103 General Biology in Autumn 2024.

2

MAT 1221 Survey of Calculus and MAT 1234 Calculus I require a passing score on the Calculus Placement Test (in Canvas). MAT 1234 Calculus I/MAT 1235 Calculus II is recommended for some graduate programs, instead of MAT 1221 Survey of Calculus.

3

CHM 4362 Biochemistry or CHM 4372 Biochemistry Lecture is recommended preparation with CHM 4361 for the MCAT.

4

Courses not used in the Physiology category can be applied to the Electives category.

5

Research (BIO 4978 Biological Research Proposal & BIO 4979 Biological Research) or BIO 4615 Bioethics may count for the Capstone Experience requirement.

Freshman Notes

- Take Math Placement Test (in Canvas) if you are at Math Level 0 or A at time of admission.

- Math Level B is a prerequisite for BIO 2102 General Biology, BIO 2103 General Biology, CHM 1212 General Chemistry II and MAT 2360 Introduction to Statistics for the Sciences.
- Students who test into Level 0 or A should plan to take MAT 0144 College Readiness Math I and/or MAT 0145 College Readiness Math II to achieve Math Level B.

Sophomore Notes

- MAT 2360 Introduction to Statistics for the Sciences is a pre-requisite for BIO 3325 Genetics and BIO 4360 Biostatistics.

Junior Notes

- BIO 3325 Genetics is offered both Autumn and Winter. It is a pre-requisite for BIO 4352 Cell Biology, which is only offered in Spring.
- Check the time schedule, as most upper division courses are offered only in certain quarters.

Four-Year Plan: <35 on Chemistry Placement Test

Course	Title	Credits
First Year		
Autumn		
CHM 1000	Preparation for General Chemistry	2
UCOL 1000	University Colloquium	1
Credits		3
Winter		
BIO 2101	General Biology	5
CHM 1211	General Chemistry I	5
PPHS 1200	Introduction to the Health Professions	1
Credits		11
Spring		
BIO 2102	General Biology	5
CHM 1212	General Chemistry II	5
Credits		10
Any Quarter		
WRI 1000	Academic Inquiry and Writing Seminar	5
WRI 1100	Disciplinary Research and Writing Seminar	5
UFDN 1000	The Christian Faith	5
Credits		15
Second Year		
Autumn		
BIO 2103	General Biology	5
PHY 1101 or PHY 1121	General Physics or Physics for Science and Engineering	5
Credits		10
Winter		
PHY 1102 or PHY 1122	General Physics or Physics for Science and Engineering	5
Credits		5
Spring		
CHM 1213	General Chemistry III	3
PHY 1103 or PHY 1123	General Physics or Physics for Science and Engineering	5
Credits		8
Any Quarter		
MAT 2360	Introduction to Statistics for the Sciences	5
Select five credits from the following: ¹		5
MAT 1221	Survey of Calculus	
MAT 1234	Calculus I	

BIO 4360	Biostatistics	
Credits		10
Third Year		
Autumn		
CHM 3371	Organic Chemistry I	5
Credits		5
Autumn or Winter		
BIO 3325	Genetics	5
Credits		5
Winter		
CHM 3372	Organic Chemistry II	5
Credits		5
Spring		
CHM 3373	Organic Chemistry III	5
Apply to graduate!		
Credits		5
Any Quarter		
BIO 3899	Scientific Literature	1
Select five credits of Physiology core courses from the following in years 3 - 4: ²		5
BIO 4256	Environmental Physiology	
BIO 4410	Human Physiology	
BIO 4413	Animal Physiology	
BIO 4415	Plant Physiology	
BIO 4418	Neurobiology	
BIO 4419	Medical Virology	
Select five credits of Ecology and Evolution Core courses from the following in years 3 - 4:		5
BIO 3000	Introduction to Biological Anthropology	
BIO 3302	Coral Reef Ecology	
BIO 3303	Evolutionary Ecology in the Galapagos Islands	
BIO 3304	Oceanography of the Galapagos Archipelago	
BIO 3305	Marine Restoration Ecology	
BIO 3310	Ecology	
BIO 3453	Biodiversity: Plant Identification and Taxonomy	
BIO 4330	Evolutionary Mechanisms	
BIO 4744	Marine Botany	
BIO 4810	Marine Ecology	
BIO 4815	Aquatic Ecology	
BIO 4825	Forest Ecology	
BIO 4835	Conservation Biology	
BIO 4840	Chemical Ecology	
Select ten credits of Electives from the following in years 3-4:		10
BIO 3350	Immunology	
BIO 3351	General Microbiology	
BIO 3432	Biodiversity: Vertebrate Biology	
BIO 4320	Principles of Development	
BIO 4325	Molecular Biology	
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CHM 4362 or CHM 4372	Biochemistry or Biochemistry Lecture	
BIO 4978 & BIO 4979	Biological Research Proposal and Biological Research (in years 3-4) ³	3
Credits		24
Fourth Year		
Autumn		
BIO 4615	Bioethics ³	3
CHM 4361	Biochemistry	5
PPHS 3400	Application Workshop	2
Credits		10

Winter		
CHM 4362 or CHM 4372	Biochemistry ⁴ or Biochemistry Lecture	5
Credits		5
Spring		
BIO 4352	Cell Biology	5
Credits		5
Total Credits		136

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Courses not used in the Physiology Core can be used in the Electives category.

3

Research (BIO 4978 Biological Research Proposal & BIO 4979 Biological Research) or BIO 4615 Bioethics may count for the Capstone Experience requirement.

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CHM 4362 Biochemistry or CHM 4372 Biochemistry Lecture is recommended preparation with CHM 4361 Biochemistry for the MCAT.

Freshman Notes

- Take Math Placement Test (in Canvas) if you are at Math Level 0 or A at time of admission.
 - Math Level B is a prerequisite for BIO 2102 General Biology, BIO 2103 General Biology, CHM 1212 General Chemistry II and MAT 2360 Introduction to Statistics for the Sciences.
- Students who test into Level 0 or A should plan to take MAT 0144 College Readiness Math I and/or MAT 0145 College Readiness Math II to achieve Math Level B.
- BIO 2102 General Biology and BIO 2103 General Biology can be taken in either order.

Sophomore Notes

- MAT 2360 Introduction to Statistics for the Sciences is a pre-requisite for BIO 3325 Genetics and BIO 4360 Biostatistics.

Junior Notes

- BIO 3325 Genetics is offered both Autumn and Winter. It is a pre-requisite for BIO 4352 Cell Biology, which is only offered in Spring.
- Check the time schedule, as most upper division courses are offered only in certain quarters.