BIOLOGICAL SCIENCE (BS)

Description

The B.S. in biological science offers in-depth study of biology and other natural sciences while preparing the student for a variety of careers or for graduate work in many fields including medicine, organismal biology, dentistry, pharmacy, veterinary medicine, education, cell or molecular biology, ecology and conservation biology. This is the degree of choice for those aspiring to be professional scientists. Students may choose one optional emphasis in ecology and evolutionary biology; integrative biology; molecular, cellular, and microbiology; organismal biology; pre-health biological sciences.

Minimum Total Credit Hours: 120

Degree Requirements

The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

General Education

Code	Title	Hours
Select one of the following First Year Writing I courses:		3
WRIT 1000	Introduction to College Writing	
or WRIT 1011	First-Year Writing I	
WRIT 1010	First-Year Writing I	
Select one of the following First Year Writing II courses:		3
WRIT 1020	First-Year Writing II	
or LIBA 1020	First Year Seminar	
Select six hours of literature survey from the following:		6
ENGL 2220	Survey in Literary History	
ENGL 2221	Survey of World Literature to 1650	
ENGL 2222	Survey of World Literature since 1650	
ENGL 2223	Survey of American Lit to the Civil War	
ENGL 2224	Survey of American Lit since Civil War	
ENGL 2225	Survey of British Lit to 18th Century	
ENGL 2226	Survey of Brit Lit since Romantic Period	
Select 12 hours of Social Science & Humanitiesfrom the following subjects: [1]		12
African American Studies		
Anthropology		
American Sign Language		
Classical Civilization		
ENVS 1010	Humanities and the Environment	
Gender Studies		
Greek		
History		
LIBA 2020	Interdisciplinary Humanities	
LIBA 2030	Interdisciplinary Social Sciences	
LIBA 3050	Humanities and the Experience of War	
LIBA 3120	Advanced Interdisciplinary Humanities	
LIBA 3130	Advanced Interdisc Social Science	
Philosophy		
Political Science		
Psychology		
Religious Studies		
Any Speech, Rhetoric, or Writing course at the 2000 level or higher		
Sociology		
Southern Studies		
Any of the languages offered by the Dept. of Modern Languages		
Select three hours of Fine Arts courses from the following:		3
any Art History (ARTH) course		
DANC 2000	Dance Appreciation	
MUSC 1010	Introduction to Music Literature	
MUSC 1020	Fundamentals of Music Theory	
MUSC 1030	Introduction to Music	
MUSC 1040	Introduction to World Music Cultures	
MUSC 1050	Music Theory and Analysis I	
THEA 2010	Appreciation of the Theatre	
THEA 2020	Introduction to Cinema	
LIBA 1300	Introduction to the Fine Arts	
LIBA 2040	Interdisciplinary Arts	
LIBA 3140	Advanced Interdisciplinary Arts	
Select six-eight hours of laboratory science [2]		6-8
Mathematics		3
Any MATH course at the 1000 level or above except for MATH 2451 and 2452		
Related Subjects - see footnote [3]		18
Total Hours		**54-56**

[1] At least six hours must be chosen from among the social sciences, which consist of anthropology, economics, LIBA 2030 Interdisciplinary Social Sciences, LIBA 3130 Advanced Interdisc Social Science, political science, psychology, and sociology.

[2] Majors for the B.S. degree must have 2 courses of laboratory science.

[3] 18 hours required; choose from courses listed beside the major.
Anthropology - biology, computer science, English, economics, chemistry, geology, history, mathematics, philosophy, political science, psychology, sociology
Biology - anthropology, chemistry, CLSC 2010 Medical Terminology in Greek and Latin, geology, mathematics, physics, psychology
Chemistry - mathematics, physics
Economics - math (may include MATH 2611 Unified Calculus & Analytic Geometry I, MATH 2612 Unified Calculus & Analytic Geometry II, and MATH 3750 Introduction to Statistics I, but not MATH 2511 Calculus for Business, Econ., & Accy. I, MATH 2512 Calculus for Business, Econ., & Accy. II), finance, political science, computer science
Forensic Chemistry - biology, mathematics, pharmacology, physics; up to 6 hours of pharmacology courses
Mathematics - astronomy, biology, chemistry, computer science, economics, geology, physics
Physics - mathematics
Political Science - computer science, economics, mathematics, sociology, psychology

Psychology - biology, computer science, economics, mathematics, philosophy, sociology
Sociology - anthropology, computer science, English, economics, history, mathematics, philosophy, political science, psychology

Related Subjects Residence GPA

Student must achieve a GPA of 2.00 in resident hours in related subjects.

Major Requirements

Code	Title	Hours
BISC 1600	Biological Sciences I	3
BISC 1610	Biological Sciences I Laboratory	1
BISC 1620	Biological Sciences II	3
BISC 1630	Biological Sciences II Laboratory	1
BISC 3220	General Ecology	4
BISC 3360	Genetics	4
BISC 3300	Principles of Physiology	4
or BISC 4380	Microbial Physiology	
or BISC 5016	Plant Physiology	
Select one of the following advanced electives:		4
BISC 4150	Vertebrate Histology	
BISC 4180	Introduction to Molecular Systematics	
BISC 4270	Methods in Comparative Neuroscience	
BISC 4400	Cell and Molecular Biology	
BISC 5004	Biometry	
BISC 5012	Animal Behavior	
BISC 5018	Microtechnique	
BISC 5019	Physiology of Aquatic Animals	
BISC 5021	Cell Physiology	
BISC 5030	Advanced Field Study in Ecology	
BISC 5047	Advanced Histology	
BISC 5053	Comparative Animal Physiology	
BISC 4980	Major Field Achievement Test [1]	0
Minimum of 18 hours of BISC electives at the 3000+ level		18
Total Hours		**42**

[1] Capstone Assessment. Must be taken as a senior.
[2] Seminars, BISC 4920 Directed Study in Biological Sciences II, and courses for nonmajors do not satisfy the biology electives requirement.

Major Requirements II

Code	Title	Hours
MATH 2611 & MATH 2612	Unified Calculus & Analytic Geometry I and Unified Calculus & Analytic Geometry II (with a C or better)	6
or MATH 3750	Introduction to Statistics I	
CHEM 1050	General Chemistry I (with a C or better)	3
CHEM 1060	General Chemistry II (with a C or better)	3
CHEM 1051	General Chemistry Laboratory I (with a C or better)	1
CHEM 1061	General Chemistry Laboratory II (with a C or better)	1
CHEM 2210	Elementary Organic Chemistry I (with a C or better)	3
CHEM 2211	Elementary Organic Chem. Laboratory I (with a C or better)	1
Choose one of the following: [1]		3
WRIT 3000	Rhetoric of Professional Communication	
WRIT 3100	Writing in Professional Contexts	
WRIT 3140	Writing in the Health Professions	
WRIT 3200	Technical Writing	
WRIT 3700	Editing and Proofreading	
WRIT 3800	Scientific Writing (recommended)	
WRIT 4100	Grant Writing (recommended)	
One course in the following: [2]		3
GEOL 5000	Intro. to Geographic Information Systems	
GEOE 5100	Remote Sensing	
BISC 5004	Biometry	
ECON 2300	Economic Statistics I	
EXSC 3510	Measurement & Statistics in Exercise Sci	
EXSC 5110	Applied Statistics	
MATH 3750	Introduction to Statistics I	
MATH 3780	Statistical Computing and Data Analysis	
PSYC 2071	Statistics for Behavioral Sciences	
PSYC 3272	Intermed. Statistical Methods for Psy	
SOCY 5010	Statistics	
SOCY 3670	Data Visualization & Interpretation: GIS	
BISC 5003	Topics in Bioinformatics	
CISE 1051	Programming for Engineering and Sciences	
BMED 2560	Programming for Biomedical Engineering	
Successfully complete 8-9 credits from the following with a C or better: [4]		8-9
CHEM 2220	Elementary Organic Chemistry II	
CHEM 2221	Elementary Organic Chem. Laboratory II	
CHEM 3340	Biophysical Chemistry	
CHEM 3730	Intermediate Biochemistry	
CHEM 4710	Biochemistry I	
CHEM 4720	Biochemistry II	
CHEM 5180	Molecular Biochemistry I	
PHYS 2110 & PHYS 2111	Physics for Science & Engineering I and Lab Physics for Science & Engineering I	
or PHYS 2130 & PHYS 2131	General Physics I and Laboratory Physics I	
PHYS 2120 & PHYS 2121	Physics for Science & Engineering II and Lab Physics for Science & Engineering II	
or PHYS 2140 & PHYS 2141	General Physics II and Laboratory Physics II	
PHYS 4410	Introduction to Biophysics	
GEOL 1020 & GEOL 1120	Historical Geology and Historical Geology Laboratory	
GEOL 1050 & GEOL 1150	Environmental Geology - Resources and Environmental Geology - Resources Lab	
GEOL 1200 & GEOL 1210	Dinosaurs and Dinosaurs Laboratory	
GEOL 3050	Geomorphology	
GEOL 3090	Invertebrate Paleontology	

GEOL 3140	Sedimentology and Stratigraphy
GEOL 5000	Intro. to Geographic Information Systems
ANTH 3040	Biological Anthropology
ANTH 3190	Environmental History of the South
ANTH 3200	Archaeozoology: Animal Use in History
ANTH 3300	Environmental Anthropology
ANTH 3310	Indigenous Societies and the Environment
ANTH 3490	Medical Anthropology
ANTH 3550	The Anthropology of Drugs
ANTH 3560	Ancient Health & Disease-Paleopathology
ANTH 3760	Forensic Anthropology
ANTH 4050	Bone Detectives I: Human Osteology
ANTH 4190	Dental Anthropology
ANTH 4250	Bone Detectives II: Biological Profiles
Total Hours	**32-33**

1 WRIT 3800 Scientific Writing or WRIT 4100 Grant Writing recommended. Writing courses at the 2000 level or higher will count towards General Education requirements in Social Science & Humanities.

2 Courses used to satisfy the statistics, data visualization, or data processing requirement cannot be used to satisfy the requirements for biology electives, additional requirements, or related subjects.

3 Course numbers with the R suffix represent inquiry-driven, course-based undergraduate research experience (CURE) courses, where students conduct original, open-ended, discovery-based research and may present their findings to the broader community

4 Anthropology, Sociology, and Psychology courses will count towards General Education requirements in Social Science & Humanities.

Overall Major GPA

Please contact your academic advisor for grade point requirements.

Resident Major GPA

Please contact your academic advisor for grade point requirements.

Other Academic Requirements

Students must achieve a grade of C or better in all coursework counted for the major in biological science, and every biological science course requires a grade of C or better in all prerequisite courses, including those prerequisite courses from other departments. For example, BISC 1600 Biological Sciences I and BISC 1610 Biological Sciences I Laboratory must be passed with a grade of C or better before BISC 1620 Biological Sciences II and BISC 1630 Biological Sciences II Laboratory may be taken. In addition, BISC 1600 Biological Sciences I, BISC 1610 Biological Sciences I Laboratory, BISC 1620 Biological Sciences II, and BISC 1630 Biological Sciences II Laboratory must be passed with a grade of C or better before any additional biology course at the 3000 level or above is attempted. Seminars, BISC 4920 Directed Study in Biological Sciences II, and nonmajors courses do not satisfy the biology electives requirement.

Additional coursework in physics is recommended for students with the following
emphasis areas or interests: ecology and evolutionary biology, organismal
biology, or pre-health biological sciences.

Additional coursework in geology is recommended for students with the following
emphasis areas or interests: ecology and evolutionary biology or organismal
biology.

Biology majors may choose to specialize by using their biology electives to add one optional emphasis, which requires a minimum of three courses
from the approved list for the emphasis. The same course may not satisfy
the biology core courses and an emphasis area. Students who complete relevant special topics, travel courses, or independent research courses will
consult with their academic adviser prior to enrollment in the course to determine if it fulfills a course for an emphasis area.

Emphasis-Integrative Biology

Complete 3 courses with a grade of C or better one from each of the following emphases: Ecology & Evolutionary Biology; Molecular, Cellular, Microbiology; and Organismal Biology, excluding BISC 3000 Research Methods in Biology.

Emphasis-Ecology & Evolutionary Biology

Code	Title	Hours
Select 3 courses from the following:		
BISC 3000	Research Methods in Biology	
BISC 3010	Evolution	
BISC 3050	Science in Practice	
BISC 3200	Introductory Marine Biology	
BISC 3210	Introductory Aquatic Biology	
BISC 3230	Biology of Invasive Species	
BISC 3450	Symbiosis: From Parasitism to Mutualism	
BISC 3520	Coastal Ecology	
BISC 4130	Conservation Biology	
BISC 4170	Evolution and Medicine	
BISC 4350	Research in Freshwater Biology	
BISC 4430	Ecology of Plant Communities of MS	
BISC 4450	Introduction to Coral-Reef Ecology	
BISC 4480	Tropical Studies in Biology	
BISC 4510	Ecotoxicology	
BISC 4650R	Principles of Ecological Genetics	
BISC 5004	Biometry	
BISC 5036R	Spatial Ecology	
BISC 5005	Aquatic Microbiology	
BISC 5010	Theoretical Ecology	
BISC 5013	Limnological Methods	
BISC 5014	Population Genetics	
BISC 5015	Conservation Biology: Viable Populations	
BISC 5024	Aquatic Botany	
BISC 5025	Conservation and Restoration Ecology	
BISC 5028	Conservation Physiology	
BISC 5030	Advanced Field Study in Ecology	
BISC 5034	Freshwater Insects	
BISC 5035	Plant-Insect Interactions	

BISC 5040	Chemical Ecology
BISC 5055	Biological Oceanography
BISC 5054	Ecological Physiology
BISC 5060	Microbial Experimental Evolution
BISC 5066	Evolutionary Biology
BISC 5067	Evolutionary Biology Laboratory
BISC 5068	Infectious Disease Ecology

Emphasis-Molecular, Cellular, & MicroBio

Code	Title	Hours
Select 3 courses from the following:		
BISC 3000	Research Methods in Biology	
BISC 3050	Science in Practice	
BISC 3060	Virology	
BISC 3330	General Microbiology	
BISC 3700	Introductory Molecular Genetics	
BISC 3720	Introductory Cell Biology	
BISC 4140	Immunology and Serology	
BISC 4180	Introduction to Molecular Systematics	
BISC 4360	Human and Vertebrate Genetics	
BISC 4380	Microbial Physiology	
BISC 4390	Developmental Biology	
BISC 5003	Topics in Bioinformatics	
BISC 5007	Cell Biology of Cancer	
BISC 5009	Microbial Genetics	
BISC 5011	Applied Microbiology	
BISC 5020	Medical Microbiology	
BISC 5021	Cell Physiology	
BISC 5022	Microbial Ecology	
BISC 5023	Molecular Microbiol. of Soils & Sediment	
BISC 5041	Cell Biol. of Neurodegenerative Disease	
BISC 5042	Microbial Diversity	
BISC 5048	Plant Cell and Developmental Biology	
BISC 5100	Diseases of the Nervous System	
BISC 4400	Cell and Molecular Biology	
BISC 5155	Radiation Biology	
BISC 5060	Microbial Experimental Evolution	

Emphasis-Organismal Biology

Code	Title	Hours
Select 3 courses from the following:		
BISC 3450	Symbiosis: From Parasitism to Mutualism	
BISC 3900R	Medical Botany	
BISC 5035	Plant-Insect Interactions	
BISC 3000	Research Methods in Biology	
BISC 3050	Science in Practice	
BISC 3100	Human Anatomy	
BISC 3180	Botany	
BISC 3270	Introductory Neuroscience	
BISC 3290	Biology of Fishes	
BISC 3300	Principles of Physiology	
BISC 3310	Comparative Anatomy of the Vertebrates	
BISC 3320	Comparative Embryology of Vertebrates	
BISC 3340	Ornithology	
BISC 3350	Human Reproduction	
BISC 3370	Introductory Entomology	
BISC 3380	Invertebrate Zoology	
BISC 3390	Phycology	
BISC 3420	Plant Diversity	
BISC 3490	Biology of Sharks and Their Relatives	
BISC 3500	Mammalogy	
BISC 3520	Coastal Ecology	
BISC 4150	Vertebrate Histology	
BISC 4160	Elementary Parasitology	
BISC 4270	Methods in Comparative Neuroscience	
BISC 5002	Mycology	
BISC 5004	Biometry	
BISC 5012	Animal Behavior	
BISC 5016	Plant Physiology	
BISC 5018	Microtechnique	
BISC 5019	Physiology of Aquatic Animals	
BISC 5028	Conservation Physiology	
BISC 5029	Endocrinology	
BISC 5031	Plant Morphology	
BISC 5032	Plant Taxonomy	
BISC 5033	Advanced Neuroscience	
BISC 5038	Hormones and Behavior	
BISC 5043	Functional Neuroanatomy	
BISC 5046	Herpetology	
BISC 5047	Advanced Histology	
BISC 5051	Protozoology	
BISC 5053	Comparative Animal Physiology	

Emphasis-Pre-Health Biological Sciences

Code	Title	Hours
Select 3 courses from the following:		
BISC 4400	Cell and Molecular Biology	
BISC 3900R	Medical Botany	
BISC 5100	Diseases of the Nervous System	
BISC 3000	Research Methods in Biology	
BISC 3050	Science in Practice	
BISC 3060	Virology	
BISC 3100	Human Anatomy	
BISC 3270	Introductory Neuroscience	
BISC 3300	Principles of Physiology	
BISC 3310	Comparative Anatomy of the Vertebrates	
BISC 3320	Comparative Embryology of Vertebrates	
BISC 3330	General Microbiology	
BISC 3350	Human Reproduction	
BISC 3720	Introductory Cell Biology	
BISC 4140	Immunology and Serology	
BISC 4150	Vertebrate Histology	

BISC 4170	Evolution and Medicine
BISC 4360	Human and Vertebrate Genetics
BISC 4390	Developmental Biology
BISC 5007	Cell Biology of Cancer
BISC 5020	Medical Microbiology
BISC 5021	Cell Physiology
BISC 5029	Endocrinology
BISC 5033	Advanced Neuroscience
BISC 5041	Cell Biol. of Neurodegenerative Disease
BISC 5043	Functional Neuroanatomy