

## **Emphasis-Integrative Biology**

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## **B.S. in Biological Science 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**

### **General Education Requirements**

Math 261 and 262 are required for the B.S. degree.

### **Course Requirements**

A major in biological science for the B.S. degree consists of a minimum of 42 semester hours of biology including 34 at the 300 level or above. This requirement includes introductory courses (Bisc 160, 161, 162, 163 for 8 credit hours); biology core courses for 16 credit hours; biology electives for 18 credit hours minimum; and the major field achievement test (Bisc 498, which must be taken as a senior) (0 hours). After the successful completion of Bisc 160, 161, 162, 163 as initial courses, students may enroll in advanced biology courses that must include one course in each of the four B.S. biology core areas: ecology (Bisc 322), genetics (Bisc 336), physiology (Bisc 330 or Bisc 438 or Bisc 516), and cell and molecular biology (Bisc 440).

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 course, or research course will consult with the department prior to enrollment in the course to determine if it fulfills a course for an emphasis area.

Seminars and nonmajor courses do not satisfy the minimum or 300-level requirements. In addition, two courses in calculus (Math 261 and 262), 8 hours of general chemistry (Chem 105, 106, 115, and 116), and two semesters of organic chemistry (Chem 221, 222, 225, 226) are required. Bisc 336 and Bisc 330 should be taken during the sophomore year, and Bisc 322 and Bisc 440 should be taken during the junior year.

### **Other Academic Requirements**

Students must achieve a grade of C or better in all course work counted for the major in biological science, and every biology course requires a grade of C or better in all prerequisite courses, including those prerequisite courses from other departments. For example, Bisc 160 and 161 must be passed with a grade of C or better before Bisc 162 and 163 may be taken. In addition, Bisc 160, 161, 162, and 163 must be passed with a grade of C or better before any additional biology course at the 300 level or above is attempted.

Bisc 150, 206, 207, 210, 220, and 492 can not be used toward a major in biological sciences.

## **Emphasis-Integrative Biology Course Requirements**

### **Emphasis in Integrative Biology:**

Requires a minimum of three courses, with one each from Ecology and Evolutionary Biology course list; Molecular, Cellular, and Microbiology course list; and Organismal Biology course list.

#### **Ecology and Evolutionary Biology courses:**

- Bisc 301: Evolution
- Bisc 320: Introductory Marine Biology
- Bisc 321: Introductory Aquatic Biology
- Bisc 323: Biology of Invasive Species
- Bisc 345: Symbiosis: From Parasitism to Mutualism
- Bisc 413: Conservation Biology
- Bisc 417: Evolution and Medicine
- Bisc 435: Research in Freshwater Biology
- Bisc 443: Ecology of Plant Communities of MS
- Bisc 445: Introduction to Coral-Reef Ecology
- Bisc 448: Tropical Studies in Biology
- Bisc 451: Ecotoxicology
- Bisc 504: Biometry
- Bisc 505: Aquatic Microbiology
- Bisc 510: Theoretical Ecology
- Bisc 513: Limnological Methods
- Bisc 514: Population Genetics
- Bisc 515: Conservation Biology: Viable Populations
- Bisc 524: Aquatic Botany
- Bisc 525: Conservation and Restoration Ecology
- Bisc 530: Advanced Field Study in Ecology



- Bisc 534: Freshwater Insects
- Bisc 535: Plant-Insect Interactions
- Bisc 550: Biological Oceanography
- Bisc 554: Ecological Physiology
- Bisc 566: Evolutionary Biology
- Bisc 567: Evolutionary Biology Laboratory
- Bisc 568: Infectious Disease Ecology

**Molecular, Cellular, and Microbiology courses:**

- Bisc 306: Virology
- Bisc 333: General Microbiology
- Bisc 370: Introductory Molecular Genetics
- Bisc 372: Introductory Cell Biology
- Bisc 414: Immunology and Serology
- Bisc 418: Introduction to Molecular Systematics
- Bisc 436: Human and Vertebrate Genetics
- Bisc 438: Microbial Physiology
- Bisc 439: Developmental Biology
- Bisc 440: Cell and Molecular Biology
- Bisc 503: Topics in Bioinformatics
- Bisc 507: Cell Biology of Cancer
- Bisc 509: Microbial Genetics
- Bisc 511: Applied Microbiology
- Bisc 520: Medical Microbiology
- Bisc 521: Cell Physiology
- Bisc 522: Microbial Ecology
- Bisc 523: Molecular Microbiol. of Soils & Sediment
- Bisc 541: Cell Biol. of Neurodegenerative Disease
- Bisc 542: Microbial Diversity
- Bisc 548: Plant Cell and Developmental Biology
- Bisc 555: Radiation Biology

**Organismal Biology courses:**

- Bisc 310: Human Anatomy
- Bisc 318: Botany
- Bisc 327: Introductory Neuroscience
- Bisc 329: Biology of Fishes
- Bisc 330: Introductory Physiology
- Bisc 331: Comparative Anatomy of the Vertebrates
- Bisc 332: Comparative Embryology of Vertebrates
- Bisc 334: Ornithology
- Bisc 335: Human Reproduction
- Bisc 337: Introductory Entomology
- Bisc 338: Invertebrate Zoology
- Bisc 339: Phycology
- Bisc 342: Plant Diversity
- Bisc 349: Biology of Sharks and Their Relatives
- Bisc 350: Mammalogy
- Bisc 415: Vertebrate Histology
- Bisc 416: Elementary Parasitology
- Bisc 427: Methods in Comparative Neuroscience
- Bisc 502: Mycology
- Bisc 504: Biometry
- Bisc 512: Animal Behavior
- Bisc 516: Plant Physiology
- Bisc 518: Microtechnique
- Bisc 519: Physiology of Aquatic Animals
- Bisc 529: Endocrinology
- Bisc 531: Plant Morphology
- Bisc 532: Plant Taxonomy



- Bisc 533: Advanced Neuroscience
- Bisc 538: Hormones and Behavior
- Bisc 543: Functional Neuroanatomy
- Bisc 546: Herpetology
- Bisc 547: Advanced Histology
- Bisc 551: Protozoology
- Bisc 553: Comparative Animal Physiology

## 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.

## B.S. in Biological Science

### General Education

REQUIREMENT	HOURS	DESCRIPTION
First Year Writing I	3	Complete <a href="#">Hon 101</a> , <a href="#">Writ 100</a> or <a href="#">Writ 101</a> with a passing grade.
First Year Writing II	3	Complete one of the following courses with a passing grade: <a href="#">Liba 102</a> , <a href="#">Writ 102</a> or <a href="#">Hon 102</a> .
3 hrs fine arts	3	Complete 3 hours in the area of fine or performing arts. Choose from art history, music, dance, and theatre arts. Studio and workshop courses cannot be used to satisfy this requirement. Acceptable freshman or sophomore-level courses are: <a href="#">AH 101</a> , <a href="#">AH 102</a> , <a href="#">AH 201</a> , <a href="#">AH 202</a> ; Music 101, Music 102, Music 103, Music 104, Music 105; Dance 200; and Theatre 201.
6 hrs literature survey	6	Complete 6 hours of literature survey with a passing grade. Choose from the following courses: <a href="#">Eng 220</a> , <a href="#">221</a> , <a href="#">222</a> , <a href="#">223</a> , <a href="#">224</a> , <a href="#">225</a> , or <a href="#">Eng 226</a> .
6 hrs modern/ancient language 200+	6	Successfully complete at least 6 hours at the 200 level or above in one modern or ancient language.
6 hrs social science	6	Successfully complete 6 semester hours in anthropology, economics, political science, psychology, or sociology.
6 hrs social science/humanities	6	Complete 6 hours of additional social science or humanities coursework. The courses may be chosen from African American studies, anthropology, classical civilization, economics, gender studies, history, <a href="#">Liba 202</a> , philosophy, political science, psychology, religious studies, <a href="#">Rhet 201</a> , sociology, and Southern studies.
6 hrs science	6	Successfully complete 2 courses of laboratory science.
2 science labs	8	Successfully complete at least two science laboratory courses.

### General Education II

REQUIREMENT	HOURS	DESCRIPTION
Related subjects residence	6	Students must complete at least 6 of the required 18 hours of related subject course work in residence.
Related subjects residence GPA		Student must achieve a GPA of 2.00 in resident hours in related subjects.
Related subjects	18	Complete at least 18 credit hours in the following areas: anthropology, chemistry, geology, math, physics, or psychology.
Related subject GPA		Student must achieve a GPA of 2.00 overall in the related subjects.

### Major Requirements

REQUIREMENT	HOURS	DESCRIPTION
<a href="#">Bisc 160</a> and <a href="#">161</a>	4	<a href="#">Bisc 160: Biological Sciences I</a> , <a href="#">Bisc 161: Biological Sciences I Laboratory</a>
<a href="#">Bisc 162</a> and <a href="#">163</a>	4	<a href="#">Bisc 162: Biological Sciences II</a> , <a href="#">Bisc 163: Biological Sciences II Laboratory</a>
<a href="#">Bisc 322</a>	4	<a href="#">Bisc 322: General Ecology</a>
<a href="#">Bisc 330</a> or <a href="#">438</a> or <a href="#">516</a>	4	<a href="#">Bisc 330: Introductory Physiology</a> , <a href="#">Bisc 438: Microbial Physiology</a> , <a href="#">Bisc 516: Plant Physiology</a>
<a href="#">Bisc 336</a>	4	<a href="#">Bisc 336: Genetics</a>
<a href="#">Bisc 440</a>	4	<a href="#">Bisc 440: Cell and Molecular Biology</a>
<a href="#">Bisc 498</a>		<a href="#">Bisc 498: Major Field Achievement Test</a>



REQUIREMENT	HOURS	DESCRIPTION
Biology residency hrs	18	Student must earn at least 18 hours of their major courses in residence. Directed Study ( <a href="#">Bisc 492</a> ), <a href="#">Bisc 102</a> , <a href="#">Bisc 103</a> , <a href="#">Bisc 104</a> , <a href="#">Bisc 105</a> , <a href="#">Bisc 206</a> , <a href="#">Bisc 207</a> , seminars, and non-major courses do not satisfy departmental core requirements for biology majors.
18 hrs electives	18	Complete a minimum of 18 credit hours of Bisc electives at the 300 level or above with a grade of C or better.
Overall Major GPA		Please contact your academic advisor for grade point requirements.
Resident Major GPA		Please contact your academic advisor for grade point requirements.

### Major Requirements II

REQUIREMENT	HOURS	DESCRIPTION
6 hrs in calculus	6	Successfully complete <a href="#">Math 261</a> and <a href="#">Math 262</a> .
<a href="#">Chem 105</a>	3	Complete <a href="#">Chem 105</a> with a passing grade.
<a href="#">Chem 106</a>	3	Complete <a href="#">Chem 106</a> with a passing grade.
<a href="#">Chem 115</a>	1	Complete <a href="#">Chem 115</a> with a passing grade.
<a href="#">Chem 116</a>	1	Complete <a href="#">Chem 116</a> with a passing grade.
<a href="#">Chem 221</a>	3	Complete <a href="#">Chem 221</a> with a passing grade.
<a href="#">Chem 222</a>	3	Complete <a href="#">Chem 222</a> with a passing grade.
<a href="#">Chem 225</a>	1	Complete <a href="#">Chem 225</a> with a passing grade.
<a href="#">Chem 226</a>	1	Complete <a href="#">Chem 226</a> with a passing grade.

### Emphasis-Integrative Biology

REQUIREMENT	HOURS	DESCRIPTION
3 courses Integrative	12	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 <a href="#">Bisc 300</a> .

