

# Department of Biological Sciences

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The biological sciences encompass the three basic sub-disciplines of biology: botany, microbiology and zoology. The curricula of the major areas of concentration are designed to provide the student with a broad academic base while offering valuable practical experiences in laboratory and field situations.

The biology curriculum contains a nucleus of basic courses that present unifying principles, and advanced courses in either botany or zoology. Botany may be defined as a scientific study of plants. It is the basic science of all applied fields of work having to do with plants, such as agronomy, forestry, horticulture, plant breeding and plant pathology. Zoology is a basic science of all work having to do with animals such as taxonomy, ecology, physiology.

Microbiology is the study of living microscopic and submicroscopic organisms which are of importance to mankind. Majors in microbiology are prepared to work in food processing plants, plant or animal disease control agencies, pharmaceutical companies, quality control positions, the industrial fermentation industry, and basic research in cell and molecular biology.

Majors offered in the department are the B.S. in Biological Sciences, B.S. in Medical Technology, B.S. in Microbiology, M.S. in Biological Sciences, and the Ph.D. in Biological Sciences.

A senior research thesis in the Biology is available to outstanding students. A description of the program and application materials may be obtained from the department office. A combined B.S./M.S. degree is available to outstanding students. Application to this program may be made as early as the end of the sophomore year (after completion of 60 or more hours of undergraduate courses). Students should consult with a graduate advisor if interested.

## Medical Technology Major (MEDT)

**Major Advisor: Mary Celeste Reese, Dir. of Undergraduate Advising**

Office: 117 Harned Hall

Medical technologists are prepared for positions in hospital laboratories, clinics, research laboratories, the Public Health Service industry, and in various local, state and federal health organizations.

The medical technology curriculum leading to the Bachelor of Science degree from Mississippi State University includes three years of study at Mississippi State University and one year of study in a hospital School of Medical Technology accredited by the National Accrediting Agency for Clinical Laboratory Sciences. Admission to the hospital school is competitive. A student who has satisfactorily completed the three years on the campus and has gained admission to a hospital school will register for the hospital phase and will be considered to be enrolled at Mississippi State during the final year of study. Graduates are prepared for certification by several national agencies.

## Biological Sciences Major (BIO)

**Major Advisor: Mary Celeste Reese, Dir. of Undergraduate Advising**

Office: 117 Harned Hall

## General Education and College Requirements

### English Composition

EN 1103	English Composition I	3
or EN 1163	Accelerated Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	

### Foreign Language

2 semesters - one Foreign Language (see advisor)	6
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### Humanities

Literature	3
History	3

### Mathematics

MA 1313	College Algebra	3
MA 1323	Trigonometry	3

### Fine Arts

See A&S requirements	3
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### Natural Sciences

See Major Core - Consult advisor for specifics	9-12
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### Social Sciences

Must be from 2 different areas - see A&S requirements		6
<b>Major Core - Biological Sciences</b>		
BIO 1134	Biology I	4
BIO 1144	Biology II	4
BIO 3304	General Microbiology	4
BIO 4133	Human Genetics	3
BIO 2103	Cell Biology	3
<b>Oral Communication Requirement</b>		
CO 1003	Fundamentals of Public Speaking	3
or CO 1013	Introduction to Communication	
<b>Writing Requirement</b>		
BIO 3013	Professional Writing for Biologists	3
<b>Computer Literacy Requirement</b>		
BIO 3013	Professional Writing for Biologists	3
BIO 4133	Human Genetics	3
<b>Biological Sciences Area Courses - minimum 6 hours in each area <sup>1</sup></b>		
<b>Area 1: Molecules and Cells <sup>2</sup></b>		6
BIO 4114	Cellular Physiology	
BIO 4413	Immunology	
BIO 4433	Principles of Virology	
BIO 4504	Comparative Vertebrate Embryology	
BIO 4503	Vertebrate Histology	
BCH 4603	General Biochemistry	
BCH 4613	General Biochemistry	
<b>Area 2: Anatomy and Physiology <sup>2</sup></b>		6
BIO 4204	Plant Anatomy	
BIO 4214	General Plant Physiology	
BIO 3504	Comparative Anatomy	
BIO 4514	Animal Physiology	
<b>Area 3: Organisms <sup>2</sup></b>		6
BIO 2113	Plant Biology	
BIO 2213	Survey Plant Kingdom	
BIO 3303	Parasitology	
BIO 4203	Taxonomy of Spermatophytes	
BIO 3524	Biology of Vertebrates	
WFA 4433	Mammalogy	
WFA 4443	Ornithology	
WFA 4453	Ichthyology	
<b>Area 4: Ecology and Evolution <sup>2</sup></b>		6
BIO 3104	Ecology	
BIO 4113	Evolution	
BIO 4213	Plant Ecology	
<b>Life Science Elective <sup>2</sup></b>		
Consult advisor		10
<b>Physical Science Core</b>		
CH 1213	Chemistry I	3
CH 1223	Chemistry II	3
CH 1211	Investigations in Chemistry I	1
CH 1221	Investigations in Chemistry II	1
CH 4513	Organic Chemistry I	3
CH 4523	Organic Chemistry II	3

PH 1113	General Physics I	3
PH 1123	General Physics II	3
or PH 1133	General Physics III	

**General Electives**

General Electives		13
<b>Total Hours</b>		<b>124</b>

- 1 Three Biological Sciences area courses must include a laboratory. A minimum of one animal course and one plant course is required from Areas 2, 3 or 4.)
- 2 Hours in excess of 24 hours from area courses may be deducted from elective hours. Life Science electives may be taken in other Departments but must be courses for respective "majors". See advisor.

NOTE: University, College and Department restrictions - the following courses may not be used to meet the above science requirements: BIO 1004, BIO 1023, BIO 1123, BIO 3004, BIO 3014.

**Minor in Biological Sciences**

BIO 1134	Biology I	4
BIO 1144	Biology II	4
BIO 2103	Cell Biology	3
BIO 3304	General Microbiology	4
BIO 4133	Human Genetics	3
Areas 3 or 4 listed above		3-4
<b>Total Hours</b>		<b>21-22</b>

**Microbiology Major (MIC)**

**Major Advisor: Mary Celeste Reese, Dir. of Undergraduate Advising**

Office: 117 Harned Hall

**General Education and College Requirements****English Composition**

EN 1103	English Composition I	3
or EN 1163	Accelerated Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	

**Foreign Language**

2 semesters - one Foreign Language (see advisor)		6
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**Humanities**

Literature - see A&S requirements		3
History - see A&S requirements		3

**Mathematics**

MA 1713	Calculus I	3
ST 3123	Introduction to Statistical Inference	3

**Fine Arts**

See A&S requirements		3
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**Natural Sciences**

See Major Core - Consult advisor for specifics

**Social Sciences**

Must be from 2 different areas and from A&S Core. Consult advisor for acceptable areas.		6
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**Major Core**

BIO 3304	General Microbiology	4
BIO 4405	Pathogenic Microbiology	5
BIO 4413	Immunology	3
BIO 4433	Principles of Virology	3
BIO 4443	Bacterial Genetics	3

BIO 4442	Bacterial Genetics Laboratory	2
BIO 4463	Bacterial Physiology	3
Microbiology Electives		8
<b>Oral Communication Requirement</b>		
CO 1003	Fundamentals of Public Speaking	3
or CO 1013	Introduction to Communication	
<b>Writing Requirement</b>		
BIO 3013	Professional Writing for Biologists	3
<b>Computer Literacy Requirement</b>		
BIO 3013	Professional Writing for Biologists	3
<b>Departmental Core</b>		
BIO 1134	Biology I	4
BIO 1144	Biology II	4
BIO 2103	Cell Biology	3
<b>Additional department requirements</b>		
CH 1213	Chemistry I	3
CH 1223	Chemistry II	3
CH 1211	Investigations in Chemistry I	1
CH 1221	Investigations in Chemistry II	1
CH 4513	Organic Chemistry I	3
CH 4523	Organic Chemistry II	3
CH 4511	Organic Chemistry Laboratory I	1
CH 4521	Organic Chemistry Laboratory II	1
PH 1113	General Physics I	3
PH 1123	General Physics II	3
PH 1133	General Physics III	3
BCH 4013	Principles of Biochemistry	3
BCH 4603	General Biochemistry	3
BCH 4613	General Biochemistry	3
<b>General Electives</b>		
General Electives		15-18
<b>Total Hours</b>		<b>124</b>

Applied microbiology courses are strongly recommended, regardless of the department in which they are offered (for example, Food Micro, Environmental Micro, or Soil Micro). Upper division courses in Medical Technology or Biochemistry are also acceptable. Students should see their advisor for assistance in selecting courses for microbiology elective credit. Hours in excess of 8 will reduce the general electives requirement by an equal number.

Students planning to attend professional schools should check with the faculty advisor for that program to identify additional courses that may be needed. Such courses can be taken for general elective credit.

For the pre-professional/graduate track, BCH 4603/ and 15 hours of general electives are required. For career track, BCH 4013 may be substituted for BCH 4603/BCH 4613, and 18 hours of general electives are required.

## Minor in Microbiology

BIO 1134	Biology I	4
BIO 1144	Biology II	4
BIO 3304	General Microbiology	4
BIO 4405	Pathogenic Microbiology	5
Choose one of the following:		4
BIO 3504	Comparative Anatomy	
BIO 4214	General Plant Physiology	
BIO 4324	Microbiology and Ecology of Soil	
BIO 4404	Environmental Microbiology	
BIO 4414	Microbiology of Foods	

BIO 4514	Animal Physiology	
<b>Total Hours</b>		<b>21</b>

## Medical Technology Major (MEDT) <sup>1</sup>

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### General Education and College Requirements

#### English Composition

EN 1103	English Composition I	3
or EN 1163	Accelerated Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	

#### Foreign Language

2 semesters - one Foreign Language (see advisor)		6
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#### Humanities

Literature - see A&S requirements		3
History - see A&S requirements		3

#### Mathematics

MA 1313	College Algebra	3
MA 1323	Trigonometry	3
or ST 3123	Introduction to Statistical Inference	

#### Fine Arts

See A&S requirements		3
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#### Natural Sciences

See Major Core - Consult Advisor for specifics		9-12
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#### Social Sciences

Must be from 2 different areas - See University/A&S Core		6
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#### Major Core

BIO 1134	Biology I	4
BIO 3004	Human Anatomy	4
BIO 3303	Parasitology	3
BIO 3304	General Microbiology	4
BIO 4133	Human Genetics	3
BIO 4303	Bioinstrumentation	3
BIO 4405	Pathogenic Microbiology	5
BIO 4413	Immunology	3
BIO 4610	Urinalysis	2-6
BIO 4620	Hematology	2-9
BIO 4630	Special Topics	1-9
BIO 4640	Clinical Micro	2-9
BIO 4650	Immunohematology	2-9
BIO 4660	Serology/Immunology	2-9
BIO 4670	Clinical Chemistry	2-9
BCH 4013	Principles of Biochemistry	3
CH 1213	Chemistry I	3
CH 1211	Investigations in Chemistry I	1
CH 1223	Chemistry II	3
CH 1221	Investigations in Chemistry II	1
CH 4513	Organic Chemistry I	3
CH 4523	Organic Chemistry II	3
General and Science Electives		9

**Oral Communication Requirement**

CO 1003	Fundamentals of Public Speaking	3
or CO 1013	Introduction to Communication	

**Computer Literacy Requirement**

BIO 3013	Professional Writing for Biologists	3
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**Writing Requirement**

BIO 3013	Professional Writing for Biologists	3
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<b>Total Hours</b>		<b>124</b>
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<sup>1</sup> In affiliated hospital schools of Medical Technology, admission is on a competitive basis.

**Program Consultants in Cooperating Hospitals**

Mississippi State University maintains close contact with the teaching personnel in medical technology at the following hospitals in the area:

- Jennifer Knight, MHS, MLS(ASCP), Program Director, Mississippi Baptist Medical Center, Jackson, Miss.
- Lee Montgomery, MT (ASCP), Program Director, North Mississippi Medical Center, Tupelo, Miss.
- Maralie Exton, MT (ASCP), Program Director, Vanderbilt University Medical Center, Nashville, Tenn.