Department of Biological Sciences

The Department of Biological Sciences provides an outstanding educational experience across the entire field of biology. Our expert faculty have diverse research and teaching interests that span molecular and cellular biology, microbiology, computational biology, evolutionary biology, genetics, and ecology, of all living organisms. Our faculty are actively engaged in highly interdisciplinary cutting-edge research and are committed to providing students with an extensive exposure to biological processes and systems and a deep understanding of biology at environmental, organismal, cellular, and molecular levels through engaging lectures and hands-on laboratory experiences. Graduates leave the department with the knowledge base and critical thinking skills to be successful in graduate programs leading to M.S. or Ph.D., medical, dental and veterinary schools, health professional schools, research, and teaching.

Majors offered in the department are the B.S. in Biological Sciences, B.S. in Medical Technology, and a B.S. in Microbiology. Students must earn a grade of C or higher in all BIO courses applied toward the biological sciences or microbiology major requirements.

Graduate programs offered in the department are the M.S. in Biological Sciences, Ph.D. in Biological Sciences, and an M.S. in General Biology, a distance program for science teachers. An accelerated Master's program is available to outstanding students engaged in undergraduate research.

Medical Technology Major (MEDT)

Major Advisor: Brandy Roberts, Dir. of Undergraduate Advising
Office: 115 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: Brandy Roberts, Dir. of Undergraduate Advising
Office: 115 Harned Hall

General Education and College Requirements

<table>
<thead>
<tr>
<th>English Composition</th>
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<tbody>
<tr>
<td>EN 1103 English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>or EN 1104 Expanded English Composition I</td>
<td>3</td>
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<tr>
<td>EN 1113 English Composition II</td>
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<tr>
<td>or EN 1173 Accelerated Composition II</td>
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<table>
<thead>
<tr>
<th>Foreign Language</th>
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<tbody>
<tr>
<td>Foreign Language I</td>
<td>3</td>
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<td>Foreign Language II</td>
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<table>
<thead>
<tr>
<th>Humanities</th>
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<tbody>
<tr>
<td>Literature - A&amp;S core</td>
<td>3</td>
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<tr>
<td>History - A&amp;S core</td>
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<table>
<thead>
<tr>
<th>Mathematics</th>
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</thead>
<tbody>
<tr>
<td>MA 1713 Calculus I</td>
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</tr>
<tr>
<td>ST 2113 or ST 3123 Introduction to Statistics</td>
<td>3</td>
</tr>
<tr>
<td>or ST 3123 Introduction to Statistical Inference</td>
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<table>
<thead>
<tr>
<th>Fine Arts</th>
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<tbody>
<tr>
<td>A&amp;S core</td>
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<table>
<thead>
<tr>
<th>Natural Sciences</th>
<th></th>
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<tbody>
<tr>
<td>Satisfied with the major</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Social Sciences</th>
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</thead>
<tbody>
<tr>
<td>A&amp;S core</td>
<td>6</td>
</tr>
</tbody>
</table>

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

Jr/Sr Writing  
Satisfied with BIO 3104 in the major

Major Core - Biological Sciences  
BIO 1111  
Welcome to Biological Sciences  
1
BIO 1134  
Biology I  
4
BIO 1144  
Biology II  
4
BIO 2103  
Cell Biology  
3
BIO 2113  
Plant Biology  
3
BIO 2513  
Animal Diversity  
3
BIO 3104  
Ecology  
4
BIO 3304  
General Microbiology  
4
BIO 4133  
Human Genetics  
3
BIO 4113  
Evolution  
3

Additional department requirements:
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
or PH 1133  
General Physics III  
3

Additional Science Electives  
Choose 5 courses from the following:  
15-20
BCH 4013  
Principles of Biochemistry  

BCH 4603  
General Biochemistry I  

BCH 4613  
General Biochemistry II  

BIO 2213  
Survey Plant Kingdom  

Any BIO upper division course, excluding BIO 3004, BIO 3014, and BIO 4000

General Electives  
14-19

Total Hours  
124

Restriction: The following courses may not be used to satisfy any requirement for Biological Sciences majors: BIO 1004, BIO 1023, BIO 1123.

Note: Students must complete 31 upper division hours in A&S in residence at MSU.

Minor in Biological Sciences  
A minor in Biological Sciences is an exceptional accompaniment to many academic majors, as well as students pursuing pre-professional programs. Courses required for the minor provide students with specialized knowledge in the life sciences and enhance understanding of current developments in science.

BIO 1134  
Biology I  
4
BIO 1144  
Biology II  
4
BIO 2103  
Cell Biology  
3
BIO 4113  
Evolution  
3
BIO 4133  
Human Genetics  
3

Choose one of the following:  
3-4

Minor in Biological Sciences

Social Science courses must cover two disciplines and come from A&S core.
### General Education and College Requirements

#### English Composition
- EN 1103 English Composition I 3
- or EN 1104 Expanded English Composition I 3
- EN 1113 English Composition II 3
- or EN 1173 Accelerated Composition II 3

#### Foreign Language
- Foreign Language I 3
- Foreign Language II 3

#### Humanities
- Literature - A&S core 3
- History - A&S core 3

#### Mathematics
- MA 1713 Calculus I 3
- ST 2113 Introduction to Statistics 3
- or ST 3123 Introduction to Statistical Inference 3

#### Fine Arts
- A&S core 3

#### Natural Sciences
- Satisfied within the major

#### Social Sciences
- A&S core 1 6

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

#### Jr/Sr Writing
- Satisfied with BIO 4405, BIO 4442, and BIO 4463 in the major

#### Departmental Core
- BIO 1111 Welcome to Biological Sciences 1
- BIO 1134 Biology I 4
- BIO 1144 Biology II 4
- BIO 2103 Cell Biology 3

#### 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 Upper Division Electives, excluding BIO 3004, BIO 3014, and BIO 4000 2 8

#### Additional department requirements
- 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
or PH 1133  General Physics III  3

BCH Course - Choose One:  3
BCH 4013  Principles of Biochemistry  
BCH 4603  General Biochemistry I  
BCH 4613  General Biochemistry II  

General Electives  4
Consult advisor  20

Total Hours  124

Restriction: The following courses may not be used to satisfy any requirement for Biological Sciences majors: BIO 1004, BIO 1023, BIO 1123.

Note: Students must complete 31 upper division hours in A&S in residence at MSU.

1 Social Science courses must cover two disciplines and come from A&S core.
2 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.
3 Students in the pre-professional/graduate track must take BCH 4603. Students in the career track may take BCH 4013.
4 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.

Minor in Microbiology
The minor in microbiology provides a strong complement for students who are majoring in related scientific disciplines. This is particularly true for those who have an interest in the role of microorganisms in industry, agriculture, or health. Students will develop a comprehensive understanding of microbial processes and interactions, including infectious agents of plants and animals as well as host responses to those pathogens.

BIO 1134  Biology I  4
BIO 3304  General Microbiology  4
BIO 4405  Pathogenic Microbiology  5

Choose two of the following:  6-7
BIO 4413  Immunology  
BIO 4433  Principles of Virology  
BIO 4443  Bacterial Genetics  
BIO 4463  Bacterial Physiology  
BIO 4414  Microbiology of Foods  

Total Hours  19-20

Medical Technology Major (MEDT)  1

Major Advisor: Brandy Roberts, Dir. of Undergraduate Advising
Office: 117 Harned Hall

General Education and College Requirements

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

Restriction: The following courses may not be used to satisfy any requirement for Biological Sciences majors: BIO 1004, BIO 1023, BIO 1123.

Note: Students must complete 31 upper division hours in A&S in residence at MSU.
<table>
<thead>
<tr>
<th>Requirement</th>
<th>Courses</th>
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<tbody>
<tr>
<td>Foreign Language</td>
<td>2 semesters - one Foreign Language (see advisor)</td>
</tr>
<tr>
<td>Humanities</td>
<td>Literature - see A&amp;S requirements</td>
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<td></td>
<td>History - see A&amp;S requirements</td>
</tr>
<tr>
<td>Mathematics</td>
<td>MA 1313 College Algebra</td>
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<td>MA 1323 Trigonometry</td>
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<td></td>
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<tr>
<td>Fine Arts</td>
<td>See A&amp;S requirements</td>
</tr>
<tr>
<td>Natural Sciences</td>
<td>See Major Core - Consult Advisor for specifics</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>Must be from 2 different areas - See University/A&amp;S Core</td>
</tr>
<tr>
<td>Major Core</td>
<td>BIO 1134 Biology I</td>
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<tr>
<td></td>
<td>BIO 3004 Human Anatomy</td>
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<td></td>
<td>BIO 3303 Parasitology</td>
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<td></td>
<td>BIO 3304 General Microbiology</td>
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<td>BIO 4133 Human Genetics</td>
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<td>BIO 4303 Bioinstrumentation</td>
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<td></td>
<td>BIO 4405 Pathogenic Microbiology</td>
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<td></td>
<td>BIO 4413 Immunology</td>
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<td>BIO 4610 Urinalysis</td>
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<td></td>
<td>BIO 4620 Hematology</td>
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<td>BIO 4630 Special Topics</td>
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<td>BIO 4670 Clinical Chemistry</td>
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<td>BCH 4013 Principles of Biochemistry</td>
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<td>CH 1213 Chemistry I</td>
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<td>CH 1211 Investigations in Chemistry I</td>
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<td>CH 1221 Investigations in Chemistry II</td>
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<td></td>
<td>CH 4513 Organic Chemistry I</td>
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<td></td>
<td>CH 4523 Organic Chemistry II</td>
</tr>
<tr>
<td>General and Science Electives</td>
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<tr>
<td>Oral Communication Requirement</td>
<td>Fundamentals of Public Speaking</td>
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<tr>
<td></td>
<td>or CO 1013 Introduction to Communication</td>
</tr>
<tr>
<td>Computer Literacy Requirement</td>
<td>Satisfied by successful completion of BIO 3303, BIO 4303, and BIO 4405</td>
</tr>
<tr>
<td>Writing Requirement</td>
<td>Satisfied by successful completion of BIO 3303, BIO 4303, and BIO 4405</td>
</tr>
<tr>
<td>Total Hours</td>
<td>124</td>
</tr>
</tbody>
</table>

1 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), affiliate faculty and Program Director, Mississippi Baptist Medical Center, Jackson, Miss.
• Lee Montgomery, MT (ASCP), affiliate faculty and Program Director, North Mississippi Medical Center, Tupelo, Miss.
• Holly Covas, MT (ASCP), affiliate faculty and Program Director, Vanderbilt University Medical Center, Nashville, Tenn.
• Dr. Nathan Johnson, Chair and Professor, Department of Laboratory Sciences at the University of Arkansas for Medical Sciences