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, B.S. in Microbiology, 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: 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)

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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	
Foreign Language		
2 semesters - one Foreign Langua	age (see advisor)	6
Humanities		
Literature		3
History		3
Mathematics		
MA 1713	Calculus I	3
ST 3123	Introduction to Statistical Inference	3
Fine Arts		
See A&S requirements		3
Natural Sciences		
See Major Core - Consult advisor	for specifics	9-12
Social Sciences		
Must be from 2 different areas - se	ee A&S requirements	6
Oral Communication Requireme	ent	
CO 1003	Fundamentals of Public Speaking	3
or CO 1013	Introduction to Communication	
Writing Requirement		

Satisfied by successful completion of BIO 3104

Computer Literacy Requirement Satisfied by successful completion of BIO 3104 Major Core - Biological Sciences BIO 1134 Biology I 4 BIO 1134 General Microbiology 4 BIO 4133 Human Genetics 3 BIO 2103 Cell Biology 3 BIO 2113 Plant Biology 3 BIO 2113 Chemistry I 3 BIO 4113 Evolution 3 BIO 4113 Chemistry I 3 CH 1215 Chemistry I 3 CH 1221 Investigations in Chemistry I 1 CH 4523 Organic Chemistry I 3 CH 4521 Organic Chemistry I 1					
Major Core - Biological Sciences 6 BIO 1134 Biology I 4 BIO 1144 Biology II 4 BIO 3104 General Microbiology 4 BIO 4133 Human Genetics 3 BIO 2103 Cell Biology 3 BIO 2113 Plant Biology 3 BIO 2513 Animal Diversity 3 BIO 3104 Ecology 4 BIO 4113 Evolution 3 BIO 113 Chemistry I 3 Ch 1213 Chemistry I 3 CH 1213 Chemistry I 3 CH 1224 Chemistry I 1 CH 1225 Chemistry II 1 CH 4513 Organic Chemistry II 1 CH 4523 Organic Chemistry II 1 CH 4521 Organic Chemistry Laboratory I 1 CH 4521 Organic Chemistry II 1 CH 4521 Organic Chemistry II 3 General Physics II 3 3 or H 1133 General Physics III 3 Ard Hotional Science Electives					
BIO 1134 Biology I 4 BIO 1144 Biology I 4 BIO 304 General Microbiology 4 BIO 313 Human Genetics 3 BIO 2103 Cell Biology 3 BIO 2113 Plant Biology 3 BIO 2113 Animal Diversity 3 BIO 2113 Animal Diversity 3 BIO 3104 Ecology 4 BIO 4113 Evolution 3 Additional department requirements: 3 CH 1213 Chemistry I 3 CH 1221 Investigations in Chemistry I 1 CH 1221 Investigations in Chemistry I 1 CH 4513 Organic Chemistry I 3 CH 4524 Organic Chemistry Laboratory I 1 CH 4521 Organic Chemistry Laboratory I 1 PH 1123 General Physics I 3 or PH 1133 General Physics I 3 or PH 1133 General Physics III 3 Additional Science Electives 5200 Choose 5 courses from the following: Finciples of Biochemistry I BCH 4613 General Biochemistry I 5 BCH 4613 General Biochemistry I 5 BCH 4613	, ,				
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BIO 3304General Microbiology4BIO 4133Human Genetics3BIO 2103Cell Biology3BIO 2113Plant Biology3BIO 2513Animal Diversity3BIO 3104Ecology4BIO 4113Evolution3Additional department requirements:7CH 1213Chemistry I3CH 1223Chemistry I3CH 1224Investigations in Chemistry I1CH 4523Organic Chemistry II3CH 4523Organic Chemistry I3CH 4521Organic Chemistry I3CH 4521Organic Chemistry I1CH 4521Organic Chemistry Laboratory I1CH 4521Organic Chemistry Laboratory I3PH 1123General Physics I3or PH 1133General Physics II3PH 1134General Physics II3or PH 1135General Physics III5BCH 4013Principles of Biochemistry I5BCH 4013General Biochemistry I5BCH 403General Biochemistry I5BCH 4403General Biochemistry I5BCH 4403General Biochemistry I5BCH 4413General Biochemistry II5BCH 4413General Biochemistry II5BCD 4403General Biochemistry II5BCD 4403General Biochemistry II5BIO 2213Survey Plant Kingdom7Any 3000- or 4000- level BIO course, ext-tring					
BIO 4133 Huma Genetics 3 BIO 2103 Cell Biology 3 BIO 2113 Plant Biology 3 BIO 2113 Plant Biology 3 BIO 2513 Animal Diversity 3 BIO 3104 Ecology 3 BIO 4113 Evolution 3 Additional department requirements: 3 CH 1213 Chemistry I 3 CH 1223 Chemistry I 3 CH 1221 Investigations in Chemistry I 1 CH 1221 Investigations in Chemistry I 1 CH 4513 Organic Chemistry I 3 CH 4523 Organic Chemistry Laboratory I 1 CH 4521 Organic Chemistry Laboratory I 1 PH 1113 General Physics II 3 or PH 1133 General Biochemistry I 5 BCH 4013 General Biochemistry I		Biology II	4		
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BIO 2113Plant Biology3BIO 2513Animal Diversity3BIO 3104Ecology4BIO 4113Evolution3Additional department requirements:3CH 1213Chemistry I3CH 1223Chemistry II3CH 1211Investigations in Chemistry I1CH 4513Organic Chemistry II1CH 4523Organic Chemistry II3CH 4511Organic Chemistry II3CH 4521Organic Chemistry Laboratory I1CH 4521Organic Chemistry II3PH 1123General Physics I3or PH 1133General Physics II3Ordinal Science Electives15-20Choose 5 courses from the following:BCH 4013General Biochemistry IIBCH 4013General Biochemistry II5BCH 4013General Biochemistry II5BCD 213Survey Plant Kingdom4Any 3000- or 4000- Ievel BIO course, exclusion Guo 4000, BIO 3014, and BIO 40005General Electives50-2450-24General Electives50-2450-24General Electives50-2450-24General Elective50-2450-24General Biochemistry I50-24 <td< td=""><td>BIO 4133</td><td></td><td>3</td></td<>	BIO 4133		3		
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BIO 3104Ecology4BIO 4113Evolution3Additional department requirements:3CH 1213Chemistry I3CH 1223Chemistry III3CH 1221Investigations in Chemistry I1CH 4513Organic Chemistry II3CH 4523Organic Chemistry II3CH 4521Organic Chemistry Laboratory I1CH 4521Organic Chemistry Laboratory I1CH 4521Organic Chemistry Laboratory I1CH 4523General Physics II3or PH 1133General Physics II3or PH 1133General Physics II3BCH 4013Principles of Biochemistry I520Choose 5 courses from the following:520BCH 4013General Biochemistry I520BCH 4013General Biochemistry I521BCD 2213Survey Plant Kingdom Any 3000- or 4000- level BIO course, excluding BIO 3004, BIO 3014, and BIO 40005223General Electives5220	BIO 2113	Plant Biology	3		
BIO 4113Evolution3Additional department requirements:1CH 1213Chemistry I3CH 1223Chemistry II3CH 1221Investigations in Chemistry I1CH 4211Investigations in Chemistry I1CH 4513Organic Chemistry II3CH 4523Organic Chemistry I3CH 4521Organic Chemistry Laboratory I1CH 4521Organic Chemistry Laboratory I1PH 1113General Physics I3or PH 1133General Physics II3or PH 1133General Physics III3Choose 5 courses from the following:55BCH 4013Principles of Biochemistry I5BCH 4613General Biochemistry II5BCH 4613General Biochemistry I5BCH 4613General Biochemistry I5BIO 2213Survey Plant Kingdom4Any 3000- or 4000- level BIO course, excluser BIO 3004, BIO 3014, and BIO 40005General Electives55General Electives5General Electives5General Electives5General Electives5General Biochemistry I5	BIO 2513	Animal Diversity	3		
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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 CH 4521 Organic Chemistry Laboratory II 1 PH 1113 General Physics I 3 or PH 1133 General Physics III 3 Additional Science Electives 15-20 Choose 5 courses from the following: 1 BCH 4013 General Biochemistry II 1 BCH 4603 General Biochemistry II 1 BCH 4613 General Biochemistry II 1 BIO 2213 Survey Plant Kingdom 1 Any 3000- or 4000- level BIO course, excluing BIO 3004, BIO 3014, and BIO 4000 15-20	CH 1213	Chemistry I	3		
CH 1221Investigations in Chemistry II1CH 4513Organic Chemistry I3CH 4523Organic Chemistry II3CH 4511Organic Chemistry Laboratory I1CH 4521Organic Chemistry Laboratory II1CH 4521Organic Chemistry Laboratory II1PH 1113General Physics I3or PH 1133General Physics III3or PH 1133General Physics III3Additional Science Electives15-20Choose 5 courses from the following:5BCH 4013Principles of Biochemistry IIBCH 4603General Biochemistry IIBIO 2213Survey Plant KingdomAny 3000- or 4000- level BIO course, excluding BIO 3004, BIO 3014, and BIO 4000General Electives15-20	CH 1223	Chemistry II	3		
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CH 4511Organic Chemistry Laboratory I1CH 4521Organic Chemistry Laboratory II1PH 1113General Physics I3PH 1123General Physics II3or PH 1133General Physics III3Additional Science Electives15-20Choose 5 courses from the following:BCH 4013General Biochemistry IBCH 4603General Biochemistry IBCH 4613General Biochemistry IIBIO 2213Survey Plant KingdomAny 3000- or 4000- level BIO course, exclusing BIO 3004, BIO 3014, and BIO 4000General Electives15-20	CH 4513	Organic Chemistry I	3		
CH 4521Organic Chemistry Laboratory II1PH 1113General Physics I3PH 1123General Physics II3or PH 1133General Physics III3Additional Science Electives15-20Choose 5 courses from the following:8CH 4013Principles of BiochemistryBCH 4013General Biochemistry I5BCH 4603General Biochemistry II5BCH 4613General Biochemistry II5BIO 2213Survey Plant Kingdom Any 3000- or 4000- level BIO course, excluing BIO 3004, BIO 3014, and BIO 400015-20General Electives15-20	CH 4523	Organic Chemistry II	3		
PH 1113 General Physics I 3 PH 1123 General Physics II 3 or PH 1133 General Physics III Additional Science Electives 15-20 Choose 5 courses from the following: BCH 4013 Principles of Biochemistry BCH 4013 General Biochemistry I BCH 4603 General Biochemistry I BCH 4613 General Biochemistry II BIO 2213 Survey Plant Kingdom Any 3000- or 4000- level BIO course, excluding BIO 3004, BIO 3014, and BIO 4000 General Electives 15-20	CH 4511	Organic Chemistry Laboratory I	1		
PH 1123 General Physics II 3 or PH 1133 General Physics III 1 Additional Science Electives 15-20 Choose 5 courses from the following: 1 BCH 4013 Principles of Biochemistry BCH 4603 General Biochemistry I BCH 4613 General Biochemistry II BIO 2213 Survey Plant Kingdom Any 3000- or 4000- level BIO course, excluing BIO 3004, BIO 3014, and BIO 4000 15-20	CH 4521	Organic Chemistry Laboratory II	1		
or PH 1133General Physics IIIAdditional Science Electives15-20Choose 5 courses from the following:BCH 4013Principles of BiochemistryBCH 4603General Biochemistry IBCH 4613General Biochemistry IIBIO 2213Survey Plant KingdomAny 3000- or 4000- level BIO course, excluding BIO 3004, BIO 3014, and BIO 4000 5-20 <th <="" colspan="2" td=""><td>PH 1113</td><td>General Physics I</td><td>3</td></th>	<td>PH 1113</td> <td>General Physics I</td> <td>3</td>		PH 1113	General Physics I	3
Additional Science Electives15-20Choose 5 courses from the following:Principles of BiochemistryBCH 4013Principles of BiochemistryBCH 4603General Biochemistry IIBCH 4613General Biochemistry IIBIO 2213Survey Plant KingdomAny 3000- or 4000- level BIO course, excluding BIO 3004, BIO 3014, and BIO 400015-20	PH 1123	General Physics II	3		
Choose 5 courses from the following: BCH 4013 Principles of Biochemistry BCH 4603 General Biochemistry I BCH 4613 General Biochemistry II BIO 2213 Survey Plant Kingdom Any 3000- or 4000- level BIO course, excluding BIO 3004, BIO 3014, and BIO 4000 General Electives 15-20	or PH 1133	General Physics III			
BCH 4013 Principles of Biochemistry BCH 4003 General Biochemistry I BCH 4613 General Biochemistry II BIO 2213 Survey Plant Kingdom Any 3000- or 4000- level BIO course, exclusing BIO 3004, BIO 3014, and BIO 4000 15-20	Additional Science Electives		15-20		
BCH 4603 General Biochemistry I BCH 4613 General Biochemistry II BIO 2213 Survey Plant Kingdom Any 3000- or 4000- level BIO course, excluding BIO 3004, BIO 3014, and BIO 4000 15-20	Choose 5 courses from the followin	g:			
BCH 4613 General Biochemistry II BIO 2213 Survey Plant Kingdom Any 3000- or 4000- level BIO course, excluding BIO 3004, BIO 3014, and BIO 4000 15-20	BCH 4013	Principles of Biochemistry			
BIO 2213 Survey Plant Kingdom Any 3000- or 4000- level BIO course, excluding BIO 3004, BIO 3014, and BIO 4000 15-20 General Electives 15-20	BCH 4603	General Biochemistry I			
Any 3000- or 4000- level BIO course, excluding BIO 3004, BIO 3014, and BIO 4000 General Electives 15-20	BCH 4613	General Biochemistry II			
General Electives 15-20	BIO 2213	Survey Plant Kingdom			
	Any 3000- or 4000- level BIO co	urse, excluding BIO 3004, BIO 3014, and BIO 4000			
Total Hours 124	General Electives		15-20		
	Total Hours		124		

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

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
BIO 2213	Survey Plant Kingdom		
Any 3000- or 4000- level BIO course excluding BIO 3004, BIO 3014, and BIO 4000			
Total Hours		20)-21

Microbiology Major (MIC)

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	
Foreign Language		
2 semesters - one Foreign Language (see ad	dvisor)	6
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
Natural Sciences		
See Major Core - Consult advisor for specific	S	
Social Sciences		
Must be from 2 different areas and from A&S	Core. Consult advisor for acceptable areas.	6
Oral Communication Requirement		
CO 1003	Fundamentals of Public Speaking	3
or CO 1013	Introduction to Communication	
Writing Requirement		
Satisfied by successful completion of BIO 44	05, BIO 4442, and BIO 4463	
Computer Literacy Requirement		
Satisfied by successful completion of BIO 44	05, BIO 4442, and BIO 4463	
Departmental Core		
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 Electives (Choose from any 30	00- or 4000- BIO courses, excluding BIO 3004, BIO 3014, and BIO 4000)	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	3-6
& PH 1123	and General Physics II	

or PH 1133	General Physics III	
BCH 4603	General Biochemistry I	3-6
& BCH 4613	and General Biochemistry II	
or BCH 4013	Principles of Biochemistry	
General Electives		
General Electives		18-21
Total Hours		124

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

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 I	3
English Composition II	3
Accelerated Composition II	
advisor)	6
	3
	3
College Algebra	3
Trigonometry	3
Introduction to Statistical Inference	
	3
	English Composition II Accelerated Composition II advisor) College Algebra Trigonometry

See Major Core - Consult Advisor for s	pecifics	9-12
Social Sciences		
Must be from 2 different areas - See U	niversity/A&S Core	6
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		
Satisfied by successful completion of E	IO 3303, BIO 4303, and BIO 4405	
Writing Requirement		
Satisfied by successful completion of E	IO 3303, BIO 4303, and BIO 4405	
Total Hours		

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.
- Jason Key, M.Ed., MLS (ASCP), affiliate faculty and Program Director, University or Arkansas for Medical Sciences, Little Rock, Ark.