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.

BS in Biological Sciences (BIO)

Major Advisor: Brandy Roberts, Dir. of Undergraduate Advising

Office: 115 Harned Hall

General Education Requirements

English Composition

EN 1103	English Composition I	3
or EN 1104	Expanded English Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	
Creative Discovery		
See A&S core		3
Humanities		
Literature - A&S core		3
History - A&S core		3
Social Sciences		
See A&S core ¹		6
Quantitative Reasoning		
MA 1713	Calculus I	3
ST 2113	Introduction to Statistics	3
or ST 3123	Introduction to Statistical Inference	
Natural Sciences		
CH 1213	Chemistry I	4
& CH 1211	and Investigations in Chemistry I	
CH 1223	Chemistry II	4
& CH 1221	and Investigations in Chemistry II	
PH 1113	General Physics I	3

College Requirements & Major Core

Conlege Requirements & I	najor core	
Foreign Language		
Foreign Language I		3
Foreign Language II		3
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 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 1123	General Physics II	3
or PH 1133	General Physics III	
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, exclud	ng BIO 3004, BIO 3014, and BIO 4000	

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

14-19

124

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

BS in Microbiology (MIC)

Major Advisor: Brandy Roberts, Dir. of Undergraduate Advising

Office: 115 Harned Hall

Free Electives

Total Hours

General Education Requirements

English Composition

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

Social Science courses must cover two disciplines and come from A&S core.

See AAS Core				
Humanites	•			
History - see A&S core			3	
History - see A&S core				
Social Sciences <				
See A&S core			3	
Maintative Reasoning				
NA 1713			6	
ST 2113 Introduction to Statistics 3 or ST 3123 Introduction to Statistical Inference Natural Sciences CH 2133 Chemistry I 4 KCH 1211 and Investigations in Chemistry II 4 CH 1222 Chemistry II 4 K CH 1221 and Investigations in Chemistry II 3 PIH 1113 General Physics I 3 College Requirements & Major Core Additional College Requirements Foreign Language 3 Foreign Language II 3 Col 1003 Fundamentals of Public Speaking in Introduction to Communication 3 JYBS Writing Satisfied with BIO 4405, BIO 4442, and BIO 4463 in the major Major Core BIO 1111 Welcome to Biological Sciences 1 BIO 1114 Biology I 4 BIO 1149 Biology I 4 BIO 2103 Call Biology I 4 BIO 3404 Beneral Microbiology 5	Quantitative Reasoning			
not not 3133 Introduction to Statistical Inference Natural Sciences CH 1213 Chemistry II 4 CH 1212 Chemistry II 4 A CH 1221 and Investigations in Chemistry II 4 CH 1221 and Investigations in Chemistry II 3 COILege Requirements & Majoration of Chemistry II 3 College Requirements & Majoration Sciences Foreign Language I 3 Foreign Language I 3 Source Colspan="2">Source Colspan	MA 1713	Calculus I	3	
Natural Sciences CH 1213 Chemistry I 4 ACH 1211 and Investigations in Chemistry I 2 CH 1222 Chemistry II 4 K CH 1221 and Investigations in Chemistry II 3 Ph 11113 General Physics I 3 College Requirements & Major Core Additional College Requirements Foreign Language Foreign Language I 3 Foreign Language II 3 Oral Communication Uniformized Language II 3 Oral Communication 3 Virs Writing 3 Satisfied with BIO 4405, BIO 4442, and BIO 4425 in the major 4 Major Core Major Core BIO 1111 Biology I 4 BIO 1114 Biology I 4 BIO 1114 Biology I 4 BIO 2103 General Microbiology 3 BIO 4405 Pathogenic Microbiology 3 <td>ST 2113</td> <td>Introduction to Statistics</td> <td>3</td>	ST 2113	Introduction to Statistics	3	
CH 1213 Chemistry I and Investigations in Chemistry I 4 8 CH 1221 2 Chemistry II and Investigations in Chemistry II 4 8 CH 1221 3 A CH 1221	or ST 3123	Introduction to Statistical Inference		
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PH 1113 General Physics I 3 College Requirements Foreign Language I 3 3 Foreign Language II 3 3 Col 1003 Fundamentals of Public Speaking 3 3 Or 1013 Introduction to Communication Jr/Sr Writing Statisfied with BIO 4405, BIO 4442, and BIO 4463 in the major Major Core BIO 1111 Welcome to Biological Sciences 1 BIO 1134 Biology I 4 BIO 1134 Biology I 4 BIO 1134 Biology I 4 BIO 1134 Biology I 4 4 BIO 1134 Biology I 4 BIO 1134 Biology I 4 BIO 330 Biology I 5 BIO 4403 <th colsp<="" td=""><td></td><td></td><td>4</td></th>	<td></td> <td></td> <td>4</td>			4
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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 3 CH 4513 Organic Chemistry I 3 CH 4523 Organic Chemistry Laboratory I 1 CH 4511 Organic Chemistry Laboratory I 1 CH 4521 Organic Chemistry Laboratory II 1 PH 1123 General Physics II 3 or PH 1133 General Physics III 3 BCH Course - Choose One: 3 BCH 4013 Principles of Biochemistry BCH 4013 Principles of Biochemistry I				
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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 4513 Organic Chemistry I 3 CH 4523 Organic Chemistry Laboratory II 1 CH 4511 Organic Chemistry Laboratory I 1 CH 4521 Organic Chemistry Laboratory II 1 PH 1123 General Physics II 3 or PH 1133 General Physics III 3 BCH Course - Choose One: 3 3 BCH 4013 Principles of Biochemistry BCH 4603 General Biochemistry I				
BIO 4463 Bacterial Physiology Microbiology Upper Division Electives, excluding BIO 3004, BIO 3014, and BIO 4000 2 Additional department requirements 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 1123 General Physics II 8 CH 4513 General Physics III 8 CH 4013 Principles of Biochemistry BCH 4603 General Biochemistry I				
Microbiology Upper Division Electives, excluding BIO 3004, BIO 3014, and BIO 4000 2 Additional department requirements 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 1123 General Physics II 3 or PH 1133 General Physics III BCH Course - Choose One: 3 BCH 4013 Principles of Biochemistry I BCH 4603 General Biochemistry I		·		
Additional department requirements CH 4513 Organic Chemistry I 3 CH 4523 Organic Chemistry Laboratory II 3 CH 4511 Organic Chemistry Laboratory I 1 CH 4521 Organic Chemistry Laboratory II 1 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				
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 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 I		excluding BIO 3004, BIO 3014, and BIO 4000 ²	8	
CH 4523 Organic Chemistry II 3 CH 4511 Organic Chemistry Laboratory I 1 CH 4521 Organic Chemistry Laboratory II 1 PH 1123 General Physics II 3 or PH 1133 General Physics III BCH Course - Choose One: ³ BCH 4013 Principles of Biochemistry BCH 4603 General Biochemistry I				
CH 4511 Organic Chemistry Laboratory I 1 CH 4521 Organic Chemistry Laboratory II 1 PH 1123 General Physics II 3 or PH 1133 General Physics III BCH Course - Choose One: 3 BCH 4013 Principles of Biochemistry BCH 4603 General Biochemistry I				
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PH 1123 General Physics II 3 or PH 1133 General Physics III BCH Course - Choose One: 3 BCH 4013 Principles of Biochemistry BCH 4603 General Biochemistry I				
or PH 1133 General Physics III BCH Course - Choose One: ³ BCH 4013 Principles of Biochemistry BCH 4603 General Biochemistry I			1	
BCH Course - Choose One: ³ BCH 4013 Principles of Biochemistry BCH 4603 General Biochemistry I			3	
BCH 4013 Principles of Biochemistry BCH 4603 General Biochemistry I		General Physics III		
BCH 4603 General Biochemistry I				
	BCH 4013	Principles of Biochemistry		
BCH 4613 General Biochemistry II	BCH 4603			
	BCH 4613	General Biochemistry II		

Free 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.

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

BS in Medical Technology (MEDT) 1

Major Advisor: Brandy Roberts, Dir. of Undergraduate Advising

Office: 117 Harned Hall

General Education Requirements

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Ena	ılieh	Cor	nnoc	ition

EN 1103	English Composition I	3
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	
Creative Discovery		
See A&S requirements		3
Humanities		
Literature - see A&S requirements		3
History - see A&S requirements		3
Social Sciences		
Must be from 2 different areas - See University	sity/A&S Core	6
Quantitative Reasoning		
MA 1323	Trigonometry	3
or ST 3123	Introduction to Statistical Inference	
Natural Sciences		
BIO 1134	Biology I	4
CH 1213	Chemistry I	4
& CH 1211	and Investigations in Chemistry I	
CH 1223	Chemistry II	4
& CH 1221	and Investigations in Chemistry II	

College Requirements & Major Core

Additional College Requirements

MA 1313	College Algebra	3
Foreign Language		
Foreign Language I		3
Foreign Language II		3
Oral Communication		
CO 1003	Fundamentals of Public Speaking	3
or CO 1013	Introduction to Communication	
Major Core		
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 4513	Organic Chemistry I	3
CH 4523	Organic Chemistry II	3
Free and Science Electives		12
Computer Literacy Requirement		
Satisfied by successful completion of BIO 3303, BIO 4303, and BIO 4405		
Writing Requirement		
Satisfied by successful completion of BIO 33	303, BIO 4303, and BIO 4405	
Total Hours		124

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

Biological Sciences Minor

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 BIC	O course excluding BIO 3004, BIO 3014, and	IO 4000
Total Hours		20-21

Microbiology Minor

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

Department of Biological Sciences

6

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