

MICROBIOLOGY MAJOR INFORMATION

Department of Microbiology
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Required Prerequisites* to the Major

Credits from these courses do not count toward the 30 hours required to complete the Major; however, some are prerequisites for required major courses. All Prerequisites must be completed prior to graduation. *General education (GE) course requirements are not included in this list. Requirements for the GE can be obtained by contacting your Arts and Sciences Academic Advisor, Mary McLaughlin (mclaughlin.154@osu.edu, (614) 292-6961, 384A BioSci Bldg.).*

Biology 1113, 1114	8 hr.
Mathematics 1156 or 1151 and one of the following: Mathematics 1152, 1157, Statistics 1450 or Statistics 2480	8-10 hr
Chemistry 1210, 1220	10 hr.
Chemistry 2510, 2520, 2540	10 hr.
Physics 1200, 1201	10 hr.

*Honors courses can substitute where available.

Additional organic chemistry courses may be required or suggested for pre-professional students.

Microbiology Major Courses—General Information

The Microbiology Major consists of a minimum of 30 semester hours. Required Core courses make up 21 of these 30 hours. All students must complete the six Core Courses and nine (9) hours of elective courses (outlined below).

The elective courses are divided into two groups: Group 1 and Group 2. Students must take at least three (3) hours of Group 1 courses and may take all nine (9) elective hours from Group 1. Students are not required to take any Group 2 courses but may have up to six (6) hours from this group count as elective hours. Students are encouraged to discuss with their microbiology major advisor any courses that are not listed in Group 2 that would be suitable to include in the Microbiology Major.

A total of three (3) semester hours graded S/U may be counted toward the Microbiology Major. These are usually earned through Individual Study, Undergraduate Research or Honors Research (Microbiology 4193, 4998, 4998H, 4999 or 4999H). Individual Study courses may be arranged by contacting any faculty member in the department. You may also discuss your research options with the Coordinator of Undergraduate Research.

Students must receive a C- or better in Microbiology courses to use them as prerequisites for other courses.

**Microbiology Major Required Core Courses
21 Hours**

Department #	Credit Hours	Course Title (Semester taught)	Prerequisites*
Biochemistry 4511	4	Introduction to Biological Chemistry (Au,Sp,Su)	Chemistry 2310 or 2510 and one semester of Biological Sciences, or permission of instructor
Microbiology 4100	5	General Microbiology (Au,Sp)	Biology 1114, Chemistry 2510 or concurrent
Microbiology 4110	3	Pathogenesis and Immunobiology (Sp)	Microbiology 4100 (C- or better)
Microbiology 4120	3	Microbial Physiology and Diversity (Au)	Microbiology 4100 (C- or better), Biochem 4511 or concurrently.
Microbiology 4130	3	Microbial Genetics (Sp)	Microbiology 4100 (C- or better) or Molecular Genetics 4500 or 4606
Microbiology 4140	3	Molecular Microbiology Laboratory (Au,Sp)	Microbiology 4100 (C- or better), Microbiology 4130 or concurrently, or permission of instructor

*or honors equivalent

**Microbiology Major Courses
ELECTIVE COURSES, GROUP 1:
Take 3-9 hr. from this group**

Micro. Course No.	Credit Hours	Course Title (Semester taught)	Prerequisites
4193	1-3 <i>Graded S/U</i>	Individual Studies (Au,Sp,Su)	Permission of instructor. Maximum of 3 credit hours can be counted toward the Major.
4591S	1 <i>Graded S/U</i>	DNA Fingerprinting; Service learning course (Sp)	Students present workshops at Columbus Public High Schools.
5122	2	Immunobiology (Au)	C- or better in either Microbiology 4000 or 4100
5129	3	Cellular and Molecular Biology of Pathogenic Eukaryotes (Sp)	Microbiology 4100 or permission of instructor
5147	3	Eukaryotic Pathogens (Au)	Microbiology 4100 (C- or better)
5149	3	Introductory Virology (Sp)	Microbiology 4100 (C- or better)
5150	3	Microbial Ecology (TBD)	C- or better in Microbiology 4000 or equivalent
5155	3	Environmental Microbiology (Au)	C- or better in Microbiology 4000 or equivalent
5161H	3	Bioinformatics and Molecular Microbiology (TBD)	Microbiology 4130 or Molecular Genetics 4500; Biochemistry 4511; or permission of instructor
5169	3	Microbial Evolution (Au)	6 semester hours of biological sciences course work
5169H	3	Microbial Evolution (TBD)	6 semester hours of biological sciences course work
5536	3	Food Microbiology Lecture (Au)	C- or better in either Microbiology 4000 or 4100

5546	3	Food Microbiology Laboratory (Sp)	Microbiology 5536
Undergraduate Research			
4998/4998H 4999/4999H	1-5 Graded S/U	Undergraduate Research in Microbiology(Au,Sp,Su) Undergraduate Research in Microbiology—Thesis (Au,Sp,Su)	Permission of instructor. Maximum of 3 credit hours for any combination of these courses can be counted toward the Major. Completion of thesis requires a minimum of 4 cumulative credit hours and final thesis examination. Check with your advisor for details.

Students must meet with an advisor to have coursework pre-approved for Study at a Foreign institution or a Domestic Study Tour. Credit (S/U) may be applicable to the Microbiology Major.

Elective Courses, GROUP 1 (Cont.)

The courses below are GRADUATE courses and should be taken ONLY by advanced (senior year) undergraduates with instructor's permission.			
Micro. Course No.	Credit Hours	Course Title (Semester taught)	Prerequisites
6020	3	Microbial Physiology and Biochemistry (Au)	Permission of instructor
6080	3	Advanced Microbial Genetics (Sp)	Permission of instructor
7010	3	Cellular and Molecular Immunology (SP)	Permission of instructor
7020	3	Microbial Physiology Meets Pathogenesis (Sp)	Permission of instructor
7023	3	Molecular Immunology (Au)	Permission of instructor
7724	3	Molecular Pathogenesis (SP)	Permission of instructor
7536	3	Advanced Food Microbiology (Au)	Microbiology 5536 and Chemistry 1220
7060	3	Advanced Topics in Molecular Microbiology (Sp)	Permission of instructor

Courses at the 6000 level or higher are graduate courses. Students must receive permission from the College of Arts and Sciences, and the Graduate School in addition to instructor permission to enroll in Graduate level courses.

Microbiology Major Courses ELECTIVE COURSES, GROUP 2: Take 0-6 hr. from this group

Department	Credit Hours	Course Title (Semester taught)	Prerequisites
Microbiology 2200	1	Genome Biology (Sp)	Biology 1113
Microbiology 3300	2	The Biology of Pollution (TBD)	4 credit hours of biology
Microbiology 3704	3	HIV: From Microbiology to Macrohistory (Sp)	English 1110.xx and History at the 2000-level and above, or permission of instructor
Animal Science 6090	3	Anaerobic Microbiology (Sp)	Microbiology 4100 and Biochemistry 4511

Biochemistry 5621	4	Introduction to Biological Chemistry Laboratory (Au,Sp)	Biochemistry 4511 or 5613 or equivalent
CBE 5765	3	Principles of Biochemical Engineering (Sp)	CBE 2523 or 3610, or Graduate standing or permission of instructor.
ENVENG 5120	3	Bioremediation of Groundwater and Soil (Sp 2015, 2017)	EnvEng 5110 and a class in Microbiology; Graduate Standing or permission of instructor.
ENR 5263	3	Biology of Soil Ecosystems (Sp)	ENR 3000 or Grad Standing
Molecular Genetics 4500	3	General Genetics (Au,Sp,Su)	Biology 1101 (101), 113 (113), or 1113H (115H), and 3 additional semester credit hours in Biological Sciences
Molecular Genetics 4501	1	General Genetics Laboratory (Au)	Molecular Genetics 4500 or permission of instructor
Molecular Genetics 4606	4	Molecular Genetics (Au,Sp)	Biology 1113 (113), 1113H (115H), 1114 (114), 1114H (116H), or Chem 1220 (121) or equiv, or permission of instructor
Plant Pathology 5010	2	Phytobacteriology (Sp)	Plant Pathology 3002 or Microbiology 4100, or permission of instructor
Plant Pathology 5020	2	Introduction to Plant Virology (Sp)	Plant Pathology 3001, Biochemistry 4511, or Microbiology 4000 or permission of instructor
Plant Pathology 5040	3	Science of Fungi: Mycology (Au)	Biology 1114 or Plant Pathology 3001
PUBHEHS 6320/FDSCTE 6320	3	Global Health and Environmental Microbiology (Au)	(None)

Courses at the 6000 level or higher are graduate courses. Students must receive permission from the College of Arts and Sciences, and the Graduate School in addition to instructor permission to enroll in Graduate level courses.

Sample Curriculum Microbiology BS

Year	Autumn	Credit Hrs	Comment*	Spring	Credit Hrs	Comment	Year Total
1	Gen Chem 1210	5	GE-PhySci/Micro-PreRec	Gen Chem 1220	5	Micro-PreRec	
	Math 1151 or 1156	5	GE-Math/Micro-PreRec	Math 1152(5) or Math 1157(5) or Stats 1450(3) or Stats 2450(3) or Stats 2480(3)	3 - 5	Micro-PreRec	
	Bio 1113	4	GE-BioSci/Micro-PreRec	Bio 1114	4	Micro-PreRec	
	Freshman Survey	1	GE	GE Course	3	GE	
	Semester Sum	15		Semester Sum	15 - 17		30 - 32
Year	Autumn	Credit Hrs	Comment	Spring	Credit Hrs	Comment	Year Total
2	Org Chem 2510	4	Micro-PreRec	Org Chem 2520	4	Micro-PreRec	
	Physics 1200	5	Micro-PreRec	Org Chem Lab 2540	2	Micro-PreRec	
	GE Courses	6	GE	Physics 1201	5	Micro-PreRec	
				GE Course	3	GE	
	Semester Sum	15		Semester Sum	15		30
Year	Autumn	Credit Hrs	Comment	Spring	Credit Hrs	Comment	Year Total
3	Micro 4100	5	Micro-Core	Micro 4110	3	Micro-Core	
	BioChem 4511	4	Micro-Core	Micro 4130	3	Micro-Core	
	GE Courses	7	GE	#Micro Elective 1	3	Micro-Required	
				GE Courses	6	GE	
	Semester Sum	16		Semester Sum	15		31
Year	Autumn	Credit Hrs	Comment	Spring	Credit Hrs	Comment	Year Total
4	Micro 4120	3	Micro-Core	Micro 4140	3	Micro-Core	
	Micro Elective 2	3	Micro-Required	Micro Elective 3	3	Micro-Required	
	GE Courses	6	GE	GE Course	3	GE	
	Electives	3		Electives	6		
	Semester Sum	15		Semester Sum	15		30
						Total Hrs.	121 - 123

*Placement of specific GE courses will vary depending on the student's individual requirements and preferences. Where available, honors courses can substitute.

#Micro Electives include 3-9 hrs from Group 1 and 0-6 hrs from Group 2 courses. Up to 3 hrs of U/graded courses can be counted toward the elective requirement.

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