

From: [Vankeerbergen, Bernadette](#)
To: [Smith, Randy](#); [Reed, Katie](#)
Cc: [Martin, Andrew](#); [Staley, David](#); [Nagar, Ila](#); [Steele, Rachel](#); [Jenkins, Mary Ellen](#)
Subject: Microbiology Major-Informational item for CAA
Date: Tuesday, April 7, 2026 2:58:29 PM
Attachments: [Informational Item Microbiology Major Handout Revision.pdf](#)
[image001.png](#)

Dear Randy and Katie,

Please find attached an informational item to share at an upcoming CAA meeting.

Professor David Staley, Chair-for-the-day of ASCC, shared the proposed changes as an informational item at the ASC Curriculum Committee meeting on Friday, March 27, 2026.

Best regards,
Bernadette



THE OHIO STATE UNIVERSITY

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March 23, 2026

Dear colleagues,

The Department of Microbiology proposes to make a change in the language that pertains to elective courses in our Microbiology BS program. The change will not change requirements and is designed to minimize confusion among students and be more compatible with the new Buckeye Degree Planner system.

Current language in the Microbiology Major handout: “Only three credit hours of 2000 or 3000 level microbiology elective courses can count towards the BS-major.”

This requirement was set to prevent students graduating with only 2000- and 3000-level electives. It was meant to indicate that students must take at least 6 elective credits of 4000- and higher-level courses (out of the required 9 credits of electives). The current language is confusing to some students. Since MICRBIO 3704 (HIV: From Microbiology to Macrohistory) became a 4-credit course, some of our majors are not sure if this popular course can now count towards their elective credit. A few students think the statement means that they can take 3 credits of 2000- and 3 credits of 3000-level electives. In addition, the current language requires additional adjustments by academic advisors in Buckeye Degree Planner.

Proposed language: “Microbiology majors must have at least 6 credits of major elective courses at the 4000-level or higher.”

The new language is clear, addresses said issues, and better states the intended purpose of the requirement. Importantly, it does not change requirements in our major.

I have attached a copy of the current and proposed major handout with relevant text highlighted in yellow. Please note that the attached current major handout was also recently reformatted to include new approved courses and be more accessible.

Please let me know if you have any questions.

Sincerely,

Natividad Ruiz, Ph.D.
Professor
Vice Chair for Teaching and Undergraduate Affairs

MICROBIOLOGY MAJOR INFORMATION (Proposed)

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Department Chair: Dr. Kurt Fredrick 105 Bio Sci Bldg. 614-292-2301, e- mail	Vice Chair for Teaching & Undergraduate Affairs, Coordinator of Undergraduate Research: Dr. Natividad Ruiz 264 Aronoff Bldg. 614-292-3426, e- mail
Academic Advisor: Matt DeBlieck 320 Bio Sci. Bldg. 614-292-6961 (ASC Advising phone #), e- mail	Honors Major Advisor: Dr. Madhura Pradhan 372 Bio Sci Bldg. 614-292-1196, e- mail

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 with a minimum grade of "D". Additional science courses may be required or suggested for pre-professional students.

Prerequisite course*	Credit hours
BIOLOGY 1113** and 1114**	8-10
MATH 1156 ⁺ or 1151 ⁺	5
STAT 1450**, 2450**, or 2480**	3
CHEM 1210 ⁺ and 1220 ⁺	10
CHEM 2510, 2520, and 2540	10
PHYSICS 1200 ⁺ or 1250	5

* Honors courses can substitute where available. Alternative course sequences can also be used with prior advisor approval.

** Either version of the introductory Biology courses will be accepted (.01 or .02). Biology 1113.01 and 1114.01 are 4 credits each, and Biology 1113.02 and 1114.02 are 5 credits each.

+ Prerequisites for these courses include earning a "C-" or higher in a relevant Math course.

Microbiology Major Courses—General Information

The Microbiology Major consists of a minimum of 30 credit hours. Required **Core Courses** make up 21 of these 30 credit hours. All students must complete the 6 **Core Courses** listed below and 9 credit hours of elective courses. A minimum grade of "C-" in every major course is required.

Microbiology majors must have at least 6 credits of major elective courses at the 4000-level or higher.

Elective courses are divided into two groups: **Group 1** and **Group 2**. Students must take at least 3 credit hours from **Group 1** and may choose to take all 9 required elective credits from this group. Students are not required to take any **Group 2** courses, but they may count up to 6 credit hours from this group as elective credit. Students are encouraged to discuss with their microbiology major advisor any courses that are not listed in **Group 2** that might be suitable to include in the Microbiology major. Any changes to the major require further approval.

A total of 3 credit hours graded Satisfactory/Unsatisfactory (S/U) may be counted toward the Microbiology Major. These are usually earned through Individual Study, Undergraduate Research, or Honors Research (MICRBIO 4193, 4998, 4998H, 4999 or 4999H). Individual Study and research courses must be arranged by contacting any faculty member in the department prior to course enrollment. You may also discuss your research options with the Coordinator of Undergraduate Research or honors advisor.

Students must receive a C- or better in Microbiology courses to use them as prerequisites for other courses and count for the major. Students must have earned a grade of C- or higher for a course to transfer to Ohio State. The only exception to this requirement is courses transferred from a public institution in Ohio since 2006. In these cases, credit for courses with grades of D and D+ will transfer to Ohio State. This rule cannot be appealed. Credit earned at another institution must follow all relevant Ohio State degree requirements, including that any major course must have a minimum grade of "C-".

Microbiology Major Courses—Core courses

Microbiology Major Required Core Courses (21 Credit Hours)			
Course	Credit Hours	Course Title (Semester taught)	Prerequisites*
BIOCHEM 4511	4	Introduction to Biological Chemistry (Au, Sp, Su)	CHEM 2310 or 2510; one semester of Biological Sciences
MICRBIO 4100 [‡]	5	General Microbiology (Au, Sp)	BIOLOGY 1113 (.01 or .02); CHEM 1220
MICRBIO 4110	3	Microbial Pathogenesis and Immunobiology (Au, Sp)	MICRBIO 4100 (C- or better) [‡]
MICRBIO 4120	3	Microbial Physiology and Diversity (Au, Sp)	MICRBIO 4100 (C- or better) [‡] ; BIOCHEM 4511 or concurrently
MICRBIO 4130	3	Microbial Genetics (Au, Sp)	MICRBIO 4100 (C- or better) [‡] or MOLGEN 4500 or 4606
MICRBIO 4140	3	Molecular Microbiology Laboratory (Au, Sp)	MICRBIO 4100; MICRBIO 4130 or concurrently (C- or better) [‡]

* Honors courses can substitute where available.

[‡] Non-majors who earn an A or an A- in MICRBIO 4000(.01 or .02) can request to enter the Microbiology major without taking MICRBIO 4100. Students who enter the major via MICRBIO 4000 must take 10 credit hours of electives to complete the 30 credit hours required for the major.

Microbiology Major Courses—Elective courses

Students must select a minimum of 9 credits of major electives from the coursework below unless they enter the major via MICRBIO 4000 (after earning an A or an A-), which requires 10 credit hours of electives to complete the 30 credit hours required for the major. At least 3 credits must specifically come from **Group 1** courses and there is no minimum requirement for **Group 2** courses.

Microbiology majors must have at least 6 credits of major elective courses at the 4000-level or higher.

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.

If you plan to earn research credit for MICRBIO 4998 (H)/4999 (H) in a lab outside the Department of Microbiology, you must talk with your major advisor PRIOR to registering to confirm it will count towards the major.

GROUP 1 Microbiology Elective Courses

MICRBIO Course	Credit Hours	Course Title (Semester taught)	Prerequisites
2000	1.5 <i>Graded S/U</i>	Introduction to Microbiology Research (Au)	BIOLOGY 1113. Maximum of 3 credit hours for courses using the S/U grading basis can be counted toward the major
2100	3	Wild Yeast: From Isolation to Fermentation (Au, Sp, Su)	BIOLOGY 1110 or 1113; CHEM 1110, 1210, or 1610
3704	4	HIV: From Microbiology to Macrohistory (Sp)	Not open to students with credit for HISTORY 3704
4145	3	Introduction to Industrial Microbiology and Bioprocessing Laboratory (Au)	MICRBIO 4100 or 4000.01/.02, or permission from instructor
4150	3	Immunobiology Laboratory (Sp)	MICRBIO 4110 or 5122, or permission from instructor
4193	1-3 <i>Graded S/U</i>	Individual Studies (Au, Sp, Su)	Permission of instructor. Maximum of 3 credit hours for courses using the S/U grading basis can be counted toward the major
4591S	1 <i>Graded S/U</i>	DNA Fingerprinting; Service learning course (Sp)	MOLGEN 4500 or 4606. Maximum of 3 credit hours for courses using the S/U grading basis can be counted toward the major
4800	3	Advances in Microbial Biotechnology (Sp)	MICRBIO 4100, or BIOCHEM 4511 or 5613, or PHR 3200 (C- or better)
4891	1	Progress in Biotechnology	C- or better in MICRBIO 4100; or BIOCHEM 4511 or 5613; or PHR 3200; or permission of instructor.
4998/ 4998 H	1-5 <i>Graded S/U</i>	Undergraduate Research in Microbiology (Au, Sp, Su)	Permission of instructor. Maximum of 3 credit hours for courses using the S/U grading basis can be counted toward the Major. Thesis requires a minimum of 4 cumulative credit hours and final thesis examination. Check with your advisor for details.
4999/ 4999H		Undergraduate Research in Microbiology—Thesis (Au, Sp, Su)	
5122	3	Immunobiology (Au)	C- or better in either MICRBIO 4000 or 4110
5129	3	Cellular and Molecular Biology of Pathogenic Eukaryotes (Sp)	MICRBIO 4100 (C- or better)
5130	3	Biology by the Numbers (<i>Irregular Offerings</i>)	BIOLOGY 1113, 1114; CHEM 1210, 1220; STAT 1450, 2450, or 2480; or by permission of instructor
5147	3	Eukaryotic Pathogens (Au)	MICRBIO 4100 (C- or better)
5149	3	Introductory Virology (Sp)	MICRBIO 4100 (C- or better)
5155	3	Environmental Microbiology (Au)	MICRBIO 4000 or 4100 (C- or better)
5161	3	Bioinformatics and Molecular Microbiology (Au)	Recommended: MICRBIO 4130, or MOLGEN 4500, or BIOCHEM 4511
5270	3	Microbial Natural Products: Discovery, Biosynthesis, & Antibiotic Activity (<i>Irregular Offerings</i>)	C- or better in either MICRBIO 4120 or BIOCHEM 5614
5536	3	Food Microbiology Lecture (Au)	C- or better in either MICRBIO 4000 or 4100; Not open to students with credit for FDSCTE 5536
5546	3	Food Microbiology Laboratory (Sp)	MICRBIO 5536; Not open to students with credit for FDSCTE 5436

GROUP 2 Microbiology Elective Courses

Course	Credit Hours	Course Title (Semester taught)	Prerequisites
BIOLOGY 2200	1	Genome Biology (Sp)	BIOLOGY 1113 with SEA Phages Lab
BIOCHEM 5621	4	Introduction to Biological Chemistry Laboratory (Au, Sp)	C- or better in BIOCHEM 4511 or 5613
CBE 5765	3	Principles of Biochemical Engineering (<i>Irregular Offerings</i>)	CBE 2523 or 3610
EARTHSC 5160	3	Geomicrobiology (Sp)	Sr or Grad standing in School of Earth Sciences, Department of Microbiology, Department of Civil, Environmental, and Geodetic Engineering, or School of Environment and Natural Resources.
ENVENG 5120	3	Bioremediation of Groundwater and Soil (<i>Irregular Offerings</i>)	A class in Microbiology (4100 recommended)
ENR 5263	3	Biology of Soil Ecosystems (<i>Irregular Offerings</i>)	ENR 3000
MOLGEN 4500	3	General Genetics (Au, Sp, Su)	BIOLOGY 1101, 1113, or 1113H; 3 additional semester credit hours in Biological Sciences
MOLGEN 4501	1	General Genetics Laboratory (Au, Sp, Su)	MOLGEN 4500 or concurrently
MOLGEN 4606	4	Molecular Genetics (Au, Sp)	BIOLOGY 1113 (Recommended), 1114, or CHEM 1220
MOLGEN 5800	2	Organelle Biology (<i>Irregular Offerings</i>)	MOLGEN 4500 or 4606
PLNTPTH 5010	2	Phytobacteriology (Au)	PLNTPTH 3001 and 3002
PLNTPTH 5020	2	Introduction to Plant Virology (Au)	PLNTPTH 3001 and 3002; At least one course in Biochemistry, Microbiology, or Molecular Genetics
PLNTPTH 5040	3	Science of Fungi: Mycology (Au)	A course in the Biological sciences (BIOLOGY 1114 recommended)

Microbiology Faculty

Name	Scientific Focus	@osu.edu
Stephen Abedon	Bacteriophage ecology; phage therapy (OSU-Mansfield)	abedon.1
Brian Ahmer	Detection of microbes and host environment by Salmonella	ahmer.1
Birgit Alber	Biochemistry of central carbon metabolism	alber.8
Amal Amer	Innate immunity against Legionella and Burkholderia	amer.13
Irina Artsimovitch	Regulation of transcription	artsimovitch.1
Felix Barber	Bacterial cell biology, growth, and shape	barber.527
Stephen Bell	Chromosome organization, replication, and segregation in archaea	bell.2007
Prosper Boyaka	Mucosal Immunity	boyaka.1
Patrick Bradley	Human microbiome, computational biology, statistics, and machine learning	bradley.720
Tammy Bullwinkle	tRNA biology	bullwinkle.1
Steven Carlson	Microbial Physiology	carlson.271
Charles Daniels (Emeritus)	Molecular biology of the archaea; archaeal SNO-RNAs	daniels.7
Karen Dannemiller	Indoor Environmental Quality – environmental engineering and public health	dannemiller.70
Rajendar Deora	Molecular determinants of pathogenesis and biofilm development	deora.6
Purnima Dubey	Vaccines, Bordetella pertussis, cancer immunology	dubey.36
Mingxu Fang	Circadian clock and regulation in cyanobacteria	fang.1141
Kurt Fredrick	Mechanistic studies of protein biosynthesis	fredrick.5
Venkat Gopalan	Protein-aided RNA catalysis	gopalan.5
Karna Gowda	Systems biology approach to study microbial metabolism and ecology	gowda.51
John Gunn	Salmonella and Francisella host-pathogen interactions	gunn.43
Tina Henkin (Emeritus)	Transcription termination control in Gram positive bacteria; RNA structure/function	henkin.3
Igor Jouline	Computational biology, evolutionary genomics, signal transduction	jouline.1
Kou-San Ju	Natural products; microbial metabolism; biocatalysis	ju.109
Joseph Krzycki	Biochemistry and molecular biology of methanogenic archaea	krzycki.1
Jesse Kwiek	HIV pathogenesis and public health	kwiek.2
Shan-Lu Liu	Host restriction to viral infection; innate immunity to viruses; viral oncogenesis	liu.6244
Karin Musier-Forsyth	RNA-protein interactions; retroviral RNA packaging; aminoacyl-tRNA synthetases; tRNA biology	musier-forsyth.1
Justin North	Microbial metabolism; bio-fuels and bio-products	North.62
Steve Oghumu	Immunology	oghumu.1
Madhura Pradhan	Microbial pathogenesis and immunology	pradhan.2
Krithika Rajaram	Malaria parasite metabolism and cell biology	rajaram.24
Chad Rappleye	Molecular mechanisms of fungal virulence	rappleye.1
John Reeve (Emeritus)	Molecular biology of archaea; molecular adaptations to extreme environments	reeve.2
Virginia Rich	Global change microbiology; microbial meta-omics; Genes-to-Ecosystems inquiry	rich.270
Yasuko Rikihisa	Obligatory intracellular bacteria; Anaplasma, Ehrlichia, and Neorickettsia	rikihisa.1
Natividad Ruiz	Envelope biogenesis in Gram-negative bacteria	ruiz.82
Abhay Satoskar	Immune mechanisms	satoskar.2
Stephanie Seveau	Bacterial toxins and infectious diseases	seveau.1
Matthew Sullivan	Phage ecology, evolution, host interaction, and discovery through (meta)genomics	sullivan.948
Olli Tuovinen (Emeritus)	Environmental and industrial microbiology	tuovinen.1
Darryl Wesener	Human gut microbiota, glycobiology, chemical Biology	wesener.1
Daniel Wozniak	Bacterial pathogenesis; gene regulation	wozniak.1
Jacob Yount	Post-translational modifications; protein fatty-acylation; innate immunity to viruses	yount.37
Ahmed Yousef	Microbial safety of food; foodborne pathogens; preservation technologies	yousef.1
Jian Zhu	Viral persistence and immune response	zhu.2465

Three Sample Four-Year Plans for a Microbiology B.S.

Sample 1

Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
1	Math 1151 or 1156	5	Calculus 1 (Micro Prereq)	Chem 1220	5	Gen Chem 2 (Micro Prereq)	
	Chem 1210	5	Gen Chem 1 (Micro Prereq)	Bio 1113	4	Energy Transfer (Micro Prereq)	
	*GE: Foreign Lang 1	4	*General Education	*GE: Foreign Lang 2	4	*General Education	
	ArtsSci 1100.07	1	College Survey	*GE: Writing	3	*General Education	
	GE Launch Seminar	1	*General Education				
	Semester Sum	16		Semester Sum	16		32
Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
2	Stat 1450 (3) or Stat 2450 (3) or Stat 2480 (3)	3	Introductory Statistics (Micro Prereq)	Chem 2520	4	Org Chem Lect 2 (Micro Prereq)	
	Chem 2510	4	Org Chem Lect 1 (Micro Prereq)	Chem 2540	2	Org Chem Lab 1 (Micro Prereq)	
	Bio 1114	4	Form & Function (Micro Prereq)	Micro 4100	5	Major Core	
	*GE: Foreign Lang 3	4	*General Education	*GE: Just World 1	3	*General Education	
		Semester Sum	15		Semester Sum	14	
Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
3	Biochem 4511	4	Major Core	Physics 1200 or 1250	5	Physics 1 (Micro Prereq)	
	Micro 4110	3	Major Core	Micro 4120	3	Major Core	
	*GE: Just World 2	3	*General Education	#Micro Elective 1	3	#Major Elective	
	*GE: Lit, Visual, Perf Elective	3	*General Education Free elective	*GE: Thematic 1 *GE: Diversity	3 3	*General Education *General Education	
		Semester Sum	16		Semester Sum	17	
Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
4	Micro 4130	3	Major Core	Micro 4140	3	Major Core	
	#Micro Elective 2	3	#Major Elective	#Micro Elective 3	3	#Major Elective	
	*GE: Thematic 2	3	*General Education	*GE: Soc & Behavior	3	*General Education	
	*GE: Hist & Cultural Elective(s)	3	*General Education Free elective(s)	Elective(s) GE Reflection Seminar	2 - 3 1	Free elective(s) *General Education	
		Semester Sum	15		Semester Sum	12 - 13	
					Total Hrs.		121+

* Placement of specific GE courses will vary depending on the student's individual requirements and preferences. Micro prerequisite courses automatically fulfill the following GE categories: Mathematical & Quantitative Reasoning and Natural Science. Where available, honors courses can substitute

Major electives include 3-9 hours of Group 1 courses and 0-6 hours of Group 2 courses (9 credits total). Up to 3 hrs of S/U graded courses, including independent research (Micro 4998), can be counted toward the elective requirement.

Sample 2 (with typical additional Medical School coursework)

Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
1	Math 1151 or 1156	5	Calculus 1 (Micro Prereq)	Chem 1220	5	Gen Chem 2 (Micro Prereq)	
	Chem 1210	5	Gen Chem 1 (Micro Prereq)	Bio 1113	4	Energy Transfer (Micro Prereq)	
	*GE: Foreign Lang 1	4	*General Education	*GE: Foreign Lang 2	4	*General Education	
	ArtsSci 1100.07	1	College Survey	*GE: Writing	3	*General Education	
	GE Launch Seminar	1	*General Education				
	Semester Sum	16		Semester Sum	16		32
2	Stat 1450 (3) or Stat 2450 (3) or Stat 2480 (3)	3	Introductory Statistics (Micro Prereq)	Chem 2520	4	Org Chem Lect 2 (Micro Prereq)	
	Chem 2510	4	Org Chem Lect 1 (Micro Prereq)	Chem 2540	2	Org Chem Lab 1 (Micro Prereq)	
	Bio 1114	4	Form & Function (Micro Prereq)	Micro 4100	5	Major Core	
	*GE: Foreign Lang 3	4	*General Education	*GE: Just World 1	3	*General Education	
	Semester Sum	15		Semester Sum	14		29
3	Chem 2550	2	Org Chem Lab 2 (Pre-Med Prep)	Physics 1201 or 1251	5	Physics 2 (Pre-Med Prep)	
	Physics 1200 or 1250	5	Physics 1 (Micro Prereq)	Micro 4120	3	Major Core	
	Biochem 4511	4	Major Core	*GE: Just World 2	3	*General Education	
	*GE: Soc & Behavior	3	*Gen Ed (Rec: Psych 1100)	*GE: Thematic 1	3	*General Education	
				Elective	3	Free elective (Rec: Social 1101)	
	Semester Sum	14		Semester Sum	17		31
4	Micro 4130	3	Major Core	Micro 4110	3	Major Core	
	#Micro Elective 1	3	#Major Elective	Micro 4140	3	Major Core	
	#Micro Elective 2	3	#Major Elective	#Micro Elective 3	3	#Major Elective	
	*GE: Diversity	3	*General Education	*GE: Hist & Cultural	3	*General Education	
	*GE: Thematic 2	3	*General Education	*GE: Lit, Visual, Perf	3	*General Education	
				GE Reflection Seminar	1	*General Education	
	Semester Sum	15		Semester Sum	16		31
						Total Hrs.	121+

* Placement of specific GE courses will vary depending on the student's individual requirements and preferences. Micro prerequisite courses automatically fulfill the following GE categories: Mathematical & Quantitative Reasoning and Natural Science. Where available, honors courses can substitute
 # Major electives include 3-9 hours of Group 1 courses and 0-6 hours of Group 2 courses (9 credits total). Up to 3 hrs of S/U graded courses, including independent research (Micro 4998), can be counted toward the elective requirement.

Sample 3

Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total	
1	Math 1148	4	College Algebra (Prereq for Math)	Math 1149	3	Trigonometry (Prereq for Math)		
	*GE: Lit, Visual, Perf	3	*General Education	Chem 1210	5	Gen Chem 1 (Micro Prereq)		
	*GE: Soc & Behavior	3	*General Education	*GE: Writing	3	*General Education		
	*GE: Just World 1	3	*General Education	*GE: Hist & Cultural	3	*General Education		
	ArtsSci 1100.07	1	College Survey					
	GE Launch Seminar	1	*General Education					
	Semester Sum	15		Semester Sum	14		29	
Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total	
2	Math 1151 or 1156	5	Calculus 1 (Micro Prereq)	Stat 1450 (3) or Stat 2450 (3) or Stat 2480 (3)	3	Introductory Statistics (Micro Prereq)		
	Chem 1220	5	Gen Chem 2 (Micro Prereq)	Chem 2510	4	Org Chem Lect 1 (Micro Prereq)		
	Bio 1113	4	Energy Transfer (Micro Prereq)	Bio 1114	4	Form & Function (Micro Prereq)		
	*GE: Just World 2	3	*General Education	*GE: Foreign Lang 1	4	*General Education		
		Semester Sum	17		Semester Sum	15		32
	Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
3	Chem 2520	4	Org Chem Lect 2 (Micro Prereq)	Micro 4110	3	Major Core		
	Chem 2540	2	Org Chem Lab 1 (Micro Prereq)	Micro 4130	3	Major Core		
	Micro 4100	5	Major Core	Biochem 4511	4	Major Core		
	*GE: Foreign Lang 2	4	*General Education	*GE: Foreign Lang 3	4	*General Education		
		Semester Sum	15		Semester Sum	14		29
Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total	
4	Micro 4120	3	Major Core	Micro 4140	3	Major Core		
	#Micro Elective 1	3	#Major Elective	#Micro Elective 2	3	#Major Elective		
	Physics 1200	5	Physics 1 (Micro Prereq)	#Micro Elective 3	3	#Major Elective		
	*GE: Thematic 1	3	*General Education	*GE: Thematic 2	3	*General Education		
	*GE: Diversity	3	*General Education	GE Reflection Seminar	1	*General Education		
		Semester Sum	17		Semester Sum	13		30
						Total Hrs.	121+	

* Placement of specific GE courses will vary depending on the student's individual requirements and preferences. Micro prerequisite courses automatically fulfill the following GE categories: Mathematical & Quantitative Reasoning and Natural Science. Where available, honors courses can substitute

Major electives include 3-9 hours of Group 1 courses and 0-6 hours of Group 2 courses (9 credits total). Up to 3 hrs of S/U graded courses, including independent research (Micro 4998), can be counted toward the elective requirement.

BS/MS in Microbiology

A combined BS/MS Degree in Microbiology is an opportunity for qualified undergraduates in Microbiology to begin the graduate program in Microbiology during their senior year, with the possibility of completing the Master's degree the following year. Students who are accepted into the Microbiology BS/MS Program are allowed to count 9 semester credit hours of classes toward both the undergraduate and graduate degrees. Applications to this program are accepted from October 1 – March 1. If you are interested in this dual degree program, please talk to the Microbiology advisor.

Eligibility

- Be a Rank 4 student (90 completed credits) in good academic standing (at least 3.5 GPA)
- Have completed MICRBIO 4100[‡], MICRBIO 4120, and BIOCHEM 4511
- Application to the Microbiology BS/MS program in Spring semester of Junior Year
- Admission by the Microbiology Graduate Studies Committee and the OSU Graduate School

[‡] Non-majors who earn an A or an A- in MICRBIO 4000(.01 or .02) can request to enter the Microbiology major without taking MICRBIO 4100. Students who enter the major via MICRBIO 4000 must take 10 credit hours of electives to complete the 30 credit hours required for the BS.

Sample Combined BS/MS Curriculum (Next page)

Year	Credits	Course (title)	GE/open	BS prereq.	BS core	BS elective	MS core	MS elective	MS S/U
1-AU	15	CHEM1210 (Gen Chem I)		5					
		MATH1151 (Calc I)		5					
		BIO1113 (Biology I)		4					
		ASC1100.07 (Survey)	1						
1-SP	15	CHEM1220 (Gen Chem II)		5					
		STATS1450 (Intro)		3					
		BIO1114 (Biology II)		4					
		GE Course	3						
2-AU	16	CHEM2510 (Org Chem I)		4					
		PHYSICS1200 (Physics I)		5					
		GE Courses	7						
2-SP	15	CHEM2520 (Org Chem II)		4					
		CHEM2540 (Org Chem Lab I)		2					
		Open or GE Course	9						
3-AU	16	BIOCHEM4511 (Biochemistry)			4				
		MICRBIO4100 (General/Lab)			5				
		GE course	4						
		GE course	3						
3-SP	15	MICRBIO4110 (Path & Immunology)			3				
		MICRBIO4120 (Microbial Physiology)			3				
		GE or Open Elective(s)	9						
4-AU	16	MICRBIO4130 (Microbial Genetics)			3				
		MICRBIO4140 (Molecular Micro. Lab)			3				
		MICRBIO6020 (Micro Phys & Biochemistry)				3	3		
		MICRBIO7600 (First-year Orientation)							1
		GE course(s)	6						
4-SP	16	MICRBIO5161 (Intro. Comp. Genomics)				3	3		
		MICRBIO6080 (Adv Microbial Genetics)				3	3		
		MICRBIO7899 (Micro Colloquium)							1
		MICRBIO8899 (Seminars)							1

		GE or Open Elective(s)	8					
5-AU	12	MS elective					3	
		MS elective					3	
		MICRBIO6010 (Principles)				2		
		MICRBIO7899 (Colloquium)						1
		MICRBIO8899 (Seminars)						1
		MICRBIO7193 (Research) or MICRBIO7999						2
5-SP	10	MS elective					3	
		MS elective					3	
		MICRBIO7899 (Colloquium)						1
		MICRBIO8899 (Seminars)						1
		(optional) MICRBIO7193 (Research) or MICRBIO7999						2
Total GE/open credits			45					
Total BS prerequisite credits				46				
Total BS core credits					21			
Total BS elective credits						9		
Total BS degree credits = 121								
Total MS degree required credits							11	
Total MS degree elective credits								12
Total MS degree S/U credits								11
Total MS degree credits = 34								

MICROBIOLOGY MAJOR INFORMATION (Current)

Department of Microbiology
105 Biological Sciences Building
484 West 12th Avenue; Columbus, OH 43210
Tel: (614) 292-2301; [website](#)

Department Chair: Dr. Kurt Fredrick 105 Bio Sci Bldg. 614-292-2301, e- mail	Vice Chair for Teaching & Undergraduate Affairs, Coordinator of Undergraduate Research: Dr. Natividad Ruiz 264 Aronoff Bldg. 614-292-3426, e- mail
Academic Advisor: Matt DeBlieck 320 Bio Sci. Bldg. 614-292-6961 (ASC Advising phone #), e- mail	Honors Major Advisor: Dr. Madhura Pradhan 372 Bio Sci Bldg. 614-292-1196, e- mail

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 with a minimum grade of "D". Additional science courses may be required or suggested for pre-professional students.

Prerequisite course*	Credit hours
BIOLOGY 1113** and 1114**	8-10
MATH 1156 ⁺ or 1151 ⁺	5
STAT 1450**, 2450**, or 2480**	3
CHEM 1210 ⁺ and 1220 ⁺	10
CHEM 2510, 2520, and 2540	10
PHYSICS 1200 ⁺ or 1250	5

* Honors courses can substitute where available. Alternative course sequences can also be used with prior advisor approval.

** Either version of the introductory Biology courses will be accepted (.01 or .02). Biology 1113.01 and 1114.01 are 4 credits each, and Biology 1113.02 and 1114.02 are 5 credits each.

+ Prerequisites for these courses include earning a "C-" or higher in a relevant Math course.

Microbiology Major Courses—General Information

The Microbiology Major consists of a minimum of 30 credit hours. Required **Core Courses** make up 21 of these 30 credit hours. All students must complete the 6 **Core Courses** listed below and 9 credit hours of elective courses. A minimum grade of "C-" in every major course is required.

Elective courses are divided into two groups: **Group 1** and **Group 2**. Students must take at least 3 credit hours from **Group 1** and may choose to take all 9 required elective credits from this group. Students are not required to take any **Group 2** courses, but they may count up to 6 credit hours from this group as elective credit. Students are encouraged to discuss with their microbiology major advisor any courses that are not listed in **Group 2** that might be suitable to include in the Microbiology major. Any changes to the major require further approval.

A total of 3 credit hours graded Satisfactory/Unsatisfactory (S/U) may be counted toward the Microbiology Major. These are usually earned through Individual Study, Undergraduate Research, or

Honors Research (MICRBIO 4193, 4998, 4998H, 4999 or 4999H). Individual Study and research courses must be arranged by contacting any faculty member in the department prior to course enrollment. You may also discuss your research options with the Coordinator of Undergraduate Research or honors advisor.

Students must receive a C- or better in Microbiology courses to use them as prerequisites for other courses and count for the major. Students must have earned a grade of C- or higher for a course to transfer to Ohio State. The only exception to this requirement is courses transferred from a public institution in Ohio since 2006. In these cases, credit for courses with grades of D and D+ will transfer to Ohio State. This rule cannot be appealed. Credit earned at another institution must follow all relevant Ohio State degree requirements, including that any major course must have a minimum grade of "C-".

Microbiology Major Courses—Core courses

Microbiology Major Required Core Courses (21 Credit Hours)			
Course	Credit Hours	Course Title (Semester taught)	Prerequisites*
BIOCHEM 4511	4	Introduction to Biological Chemistry (Au, Sp, Su)	CHEM 2310 or 2510; one semester of Biological Sciences
MICRBIO 4100‡	5	General Microbiology (Au, Sp)	BIOLOGY 1113 (.01 or .02); CHEM 1220
MICRBIO 4110	3	Microbial Pathogenesis and Immunobiology (Au, Sp)	MICRBIO 4100 (C- or better)‡
MICRBIO 4120	3	Microbial Physiology and Diversity (Au, Sp)	MICRBIO 4100 (C- or better)‡; BIOCHEM 4511 or concurrently
MICRBIO 4130	3	Microbial Genetics (Au, Sp)	MICRBIO 4100 (C- or better)‡ or MOLGEN 4500 or 4606
MICRBIO 4140	3	Molecular Microbiology Laboratory (Au, Sp)	MICRBIO 4100; MICRBIO 4130 or concurrently (C- or better‡)

* Honors courses can substitute where available.

‡ Non-majors who earn an A or an A- in MICRBIO 4000(.01 or .02) can request to enter the Microbiology major without taking MICRBIO 4100. Students who enter the major via MICRBIO 4000 must take 10 credit hours of electives to complete the 30 credit hours required for the major.

Microbiology Major Courses—Elective courses

Students must select a minimum of 9 credits of major electives from the coursework below unless they enter the major via MICRBIO 4000 (after earning an A or an A-), which requires 10 credit hours of electives to complete the 30 credit hours required for the major. At least 3 credits must specifically come from **Group 1** courses and there is no minimum requirement for **Group 2** courses.

Only three credit hours of 2000 or 3000 level microbiology elective courses can count towards the BS-major.

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.

If you plan to earn research credit for MICRBIO 4998 (H)/4999 (H) in a lab outside the Department of Microbiology, you must talk with your major advisor PRIOR to registering to confirm it will count towards the major.

GROUP 1 Microbiology Elective Courses

MICRBIO Course	Credit Hours	Course Title (Semester taught)	Prerequisites
2000	1.5 <i>Graded S/U</i>	Introduction to Microbiology Research (Au)	BIOLOGY 1113. Maximum of 3 credit hours for courses using the S/U grading basis can be counted toward the major
2100	3	Wild Yeast: From Isolation to Fermentation (Au, Sp, Su)	BIOLOGY 1110 or 1113; CHEM 1110, 1210, or 1610
3704	4	HIV: From Microbiology to Macrohistory (Sp)	Not open to students with credit for HISTORY 3704
4145	3	Introduction to Industrial Microbiology and Bioprocessing Laboratory (Au)	MICRBIO 4100 or 4000.01/.02, or permission from instructor
4150	3	Immunobiology Laboratory (Sp)	MICRBIO 4110 or 5122, or permission from instructor
4193	1-3 <i>Graded S/U</i>	Individual Studies (Au, Sp, Su)	Permission of instructor. Maximum of 3 credit hours for courses using the S/U grading basis can be counted toward the major
4591S	1 <i>Graded S/U</i>	DNA Fingerprinting; Service learning course (Sp)	MOLGEN 4500 or 4606. Maximum of 3 credit hours for courses using the S/U grading basis can be counted toward the major
4800	3	Advances in Microbial Biotechnology (Sp)	MICRBIO 4100, or BIOCHEM 4511 or 5613, or PHR 3200 (C- or better)
4891	1	Progress in Biotechnology	C- or better in MICRBIO 4100; or BIOCHEM 4511 or 5613; or PHR 3200; or permission of instructor.
4998/ 4998 H	1-5 <i>Graded S/U</i>	Undergraduate Research in Microbiology (Au, Sp, Su)	Permission of instructor. Maximum of 3 credit hours for courses using the S/U grading basis can be counted toward the Major. Thesis requires a minimum of 4 cumulative credit hours and final thesis examination. Check with your advisor for details.
4999/ 4999H		Undergraduate Research in Microbiology—Thesis (Au, Sp, Su)	
5122	3	Immunobiology (Au)	C- or better in either MICRBIO 4000 or 4110
5129	3	Cellular and Molecular Biology of Pathogenic Eukaryotes (Sp)	MICRBIO 4100 (C- or better)
5130	3	Biology by the Numbers (<i>Irregular Offerings</i>)	BIOLOGY 1113, 1114; CHEM 1210, 1220; STAT 1450, 2450, or 2480; or by permission of instructor
5147	3	Eukaryotic Pathogens (Au)	MICRBIO 4100 (C- or better)
5149	3	Introductory Virology (Sp)	MICRBIO 4100 (C- or better)
5155	3	Environmental Microbiology (Au)	MICRBIO 4000 or 4100 (C- or better)
5161	3	Bioinformatics and Molecular Microbiology (Au)	Recommended: MICRBIO 4130, or MOLGEN 4500, or BIOCHEM 4511
5270	3	Microbial Natural Products: Discovery, Biosynthesis, & Antibiotic Activity (<i>Irregular Offerings</i>)	C- or better in either MICRBIO 4120 or BIOCHEM 5614
5536	3	Food Microbiology Lecture (Au)	C- or better in either MICRBIO 4000 or 4100; Not open to students with credit for FDSCTE 5536
5546	3	Food Microbiology Laboratory (Sp)	MICRBIO 5536; Not open to students with credit for FDSCTE 5436

GROUP 2 Microbiology Elective Courses

Course	Credit Hours	Course Title (Semester taught)	Prerequisites
BIOLOGY 2200	1	Genome Biology (Sp)	BIOLOGY 1113 with SEA Phages Lab
BIOCHEM 5621	4	Introduction to Biological Chemistry Laboratory (Au, Sp)	C- or better in BIOCHEM 4511 or 5613
CBE 5765	3	Principles of Biochemical Engineering (<i>Irregular Offerings</i>)	CBE 2523 or 3610
EARTHSC 5160	3	Geomicrobiology (Sp)	Sr or Grad standing in School of Earth Sciences, Department of Microbiology, Department of Civil, Environmental, and Geodetic Engineering, or School of Environment and Natural Resources.
ENVENG 5120	3	Bioremediation of Groundwater and Soil (<i>Irregular Offerings</i>)	A class in Microbiology (4100 recommended)
ENR 5263	3	Biology of Soil Ecosystems (<i>Irregular Offerings</i>)	ENR 3000
MOLGEN 4500	3	General Genetics (Au, Sp, Su)	BIOLOGY 1101, 1113, or 1113H; 3 additional semester credit hours in Biological Sciences
MOLGEN 4501	1	General Genetics Laboratory (Au, Sp, Su)	MOLGEN 4500 or concurrently
MOLGEN 4606	4	Molecular Genetics (Au, Sp)	BIOLOGY 1113 (Recommended), 1114, or CHEM 1220
MOLGEN 5800	2	Organelle Biology (<i>Irregular Offerings</i>)	MOLGEN 4500 or 4606
PLNTPTH 5010	2	Phytobacteriology (Au)	PLNTPTH 3001 and 3002
PLNTPTH 5020	2	Introduction to Plant Virology (Au)	PLNTPTH 3001 and 3002; At least one course in Biochemistry, Microbiology, or Molecular Genetics
PLNTPTH 5040	3	Science of Fungi: Mycology (Au)	A course in the Biological sciences (BIOLOGY 1114 recommended)

Microbiology Faculty

Name	Scientific Focus	@osu.edu
Stephen Abedon	Bacteriophage ecology; phage therapy (OSU-Mansfield)	abedon.1
Brian Ahmer	Detection of microbes and host environment by Salmonella	ahmer.1
Birgit Alber	Biochemistry of central carbon metabolism	alber.8
Amal Amer	Innate immunity against Legionella and Burkholderia	amer.13
Irina Artsimovitch	Regulation of transcription	artsimovitch.1
Felix Barber	Bacterial cell biology, growth, and shape	barber.527
Stephen Bell	Chromosome organization, replication, and segregation in archaea	bell.2007
Prosper Boyaka	Mucosal Immunity	boyaka.1
Patrick Bradley	Human microbiome, computational biology, statistics, and machine learning	bradley.720
Tammy Bullwinkle	tRNA biology	bullwinkle.1
Steven Carlson	Microbial Physiology	carlson.271
Charles Daniels (Emeritus)	Molecular biology of the archaea; archaeal SNO-RNAs	daniels.7
Karen Dannemiller	Indoor Environmental Quality – environmental engineering and public health	dannemiller.70
Rajendar Deora	Molecular determinants of pathogenesis and biofilm development	deora.6
Purnima Dubey	Vaccines, Bordetella pertussis, cancer immunology	dubey.36
Mingxu Fang	Circadian clock and regulation in cyanobacteria	fang.1141
Kurt Fredrick	Mechanistic studies of protein biosynthesis	fredrick.5
Venkat Gopalan	Protein-aided RNA catalysis	gopalan.5
Karna Gowda	Systems biology approach to study microbial metabolism and ecology	gowda.51
John Gunn	Salmonella and Francisella host-pathogen interactions	gunn.43
Tina Henkin (Emeritus)	Transcription termination control in Gram positive bacteria; RNA structure/function	henkin.3
Igor Jouline	Computational biology, evolutionary genomics, signal transduction	jouline.1
Kou-San Ju	Natural products; microbial metabolism; biocatalysis	ju.109
Joseph Krzycki	Biochemistry and molecular biology of methanogenic archaea	krzycki.1
Jesse Kwiek	HIV pathogenesis and public health	kwiek.2
Shan-Lu Liu	Host restriction to viral infection; innate immunity to viruses; viral oncogenesis	liu.6244
Karin Musier-Forsyth	RNA-protein interactions; retroviral RNA packaging; aminoacyl-tRNA synthetases; tRNA biology	musier-forsyth.1
Justin North	Microbial metabolism; bio-fuels and bio-products	North.62
Steve Oghumu	Immunology	oghumu.1
Madhura Pradhan	Microbial pathogenesis and immunology	pradhan.2
Krithika Rajaram	Malaria parasite metabolism and cell biology	rajaram.24
Chad Rappleye	Molecular mechanisms of fungal virulence	rappleye.1
John Reeve (Emeritus)	Molecular biology of archaea; molecular adaptations to extreme environments	reeve.2
Virginia Rich	Global change microbiology; microbial meta-omics; Genes-to-Ecosystems inquiry	rich.270
Yasuko Rikihisa	Obligatory intracellular bacteria; Anaplasma, Ehrlichia, and Neorickettsia	rikihisa.1
Natividad Ruiz	Envelope biogenesis in Gram-negative bacteria	ruiz.82
Abhay Satoskar	Immune mechanisms	satoskar.2
Stephanie Seveau	Bacterial toxins and infectious diseases	seveau.1
Matthew Sullivan	Phage ecology, evolution, host interaction, and discovery through (meta)genomics	sullivan.948
Olli Tuovinen (Emeritus)	Environmental and industrial microbiology	tuovinen.1
Darryl Wesener	Human gut microbiota, glycobiology, chemical Biology	wesener.1
Daniel Wozniak	Bacterial pathogenesis; gene regulation	wozniak.1
Jacob Yount	Post-translational modifications; protein fatty-acylation; innate immunity to viruses	yount.37
Ahmed Yousef	Microbial safety of food; foodborne pathogens; preservation technologies	yousef.1
Jian Zhu	Viral persistence and immune response	zhu.2465

Three Sample Four-Year Plans for a Microbiology B.S.

Sample 1

Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
1	Math 1151 or 1156	5	Calculus 1 (Micro Prereq)	Chem 1220	5	Gen Chem 2 (Micro Prereq)	
	Chem 1210	5	Gen Chem 1 (Micro Prereq)	Bio 1113	4	Energy Transfer (Micro Prereq)	
	*GE: Foreign Lang 1	4	*General Education	*GE: Foreign Lang 2	4	*General Education	
	ArtsSci 1100.07	1	College Survey	*GE: Writing	3	*General Education	
	GE Launch Seminar	1	*General Education				
	Semester Sum	16		Semester Sum	16		32
Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
2	Stat 1450 (3) or Stat 2450 (3) or Stat 2480 (3)	3	Introductory Statistics (Micro Prereq)	Chem 2520	4	Org Chem Lect 2 (Micro Prereq)	
	Chem 2510	4	Org Chem Lect 1 (Micro Prereq)	Chem 2540	2	Org Chem Lab 1 (Micro Prereq)	
	Bio 1114	4	Form & Function (Micro Prereq)	Micro 4100	5	Major Core	
	*GE: Foreign Lang 3	4	*General Education	*GE: Just World 1	3	*General Education	
		Semester Sum	15		Semester Sum	14	
Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
3	Biochem 4511	4	Major Core	Physics 1200 or 1250	5	Physics 1 (Micro Prereq)	
	Micro 4110	3	Major Core	Micro 4120	3	Major Core	
	*GE: Just World 2	3	*General Education	#Micro Elective 1	3	#Major Elective	
	*GE: Lit, Visual, Perf Elective	3	*General Education Free elective	*GE: Thematic 1	3	*General Education	
		Semester Sum	16		Semester Sum	17	
Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
4	Micro 4130	3	Major Core	Micro 4140	3	Major Core	
	#Micro Elective 2	3	#Major Elective	#Micro Elective 3	3	#Major Elective	
	*GE: Thematic 2	3	*General Education	*GE: Soc & Behavior	3	*General Education	
	*GE: Hist & Cultural	3	*General Education	Elective(s)	2 - 3	Free elective(s)	
	Elective(s)	3	Free elective(s)	GE Reflection Seminar	1	*General Education	
	Semester Sum	15		Semester Sum	12 - 13		27 - 28
					Total Hrs.		121+

* Placement of specific GE courses will vary depending on the student's individual requirements and preferences. Micro prerequisite courses automatically fulfill the following GE categories: Mathematical & Quantitative Reasoning and Natural Science. Where available, honors courses can substitute

Major electives include 3-9 hours of Group 1 courses and 0-6 hours of Group 2 courses (9 credits total). Up to 3 hrs of S/U graded courses, including independent research (Micro 4998), can be counted toward the elective requirement.

Sample 2 (with typical additional Medical School coursework)

Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
1	Math 1151 or 1156	5	Calculus 1 (Micro Prereq)	Chem 1220	5	Gen Chem 2 (Micro Prereq)	
	Chem 1210	5	Gen Chem 1 (Micro Prereq)	Bio 1113	4	Energy Transfer (Micro Prereq)	
	*GE: Foreign Lang 1	4	*General Education	*GE: Foreign Lang 2	4	*General Education	
	ArtsSci 1100.07	1	College Survey	*GE: Writing	3	*General Education	
	GE Launch Seminar	1	*General Education				
	Semester Sum	16		Semester Sum	16		32
2	Stat 1450 (3) or Stat 2450 (3) or Stat 2480 (3)	3	Introductory Statistics (Micro Prereq)	Chem 2520	4	Org Chem Lect 2 (Micro Prereq)	
	Chem 2510	4	Org Chem Lect 1 (Micro Prereq)	Chem 2540	2	Org Chem Lab 1 (Micro Prereq)	
	Bio 1114	4	Form & Function (Micro Prereq)	Micro 4100	5	Major Core	
	*GE: Foreign Lang 3	4	*General Education	*GE: Just World 1	3	*General Education	
	Semester Sum	15		Semester Sum	14		29
3	Chem 2550	2	Org Chem Lab 2 (Pre-Med Prep)	Physics 1201 or 1251	5	Physics 2 (Pre-Med Prep)	
	Physics 1200 or 1250	5	Physics 1 (Micro Prereq)	Micro 4120	3	Major Core	
	Biochem 4511	4	Major Core	*GE: Just World 2	3	*General Education	
	*GE: Soc & Behavior	3	*Gen Ed (Rec: Psych 1100)	*GE: Thematic 1	3	*General Education	
				Elective	3	Free elective (Rec: Social 1101)	
	Semester Sum	14		Semester Sum	17		31
4	Micro 4130	3	Major Core	Micro 4110	3	Major Core	
	#Micro Elective 1	3	#Major Elective	Micro 4140	3	Major Core	
	#Micro Elective 2	3	#Major Elective	#Micro Elective 3	3	#Major Elective	
	*GE: Diversity	3	*General Education	*GE: Hist & Cultural	3	*General Education	
	*GE: Thematic 2	3	*General Education	*GE: Lit, Visual, Perf	3	*General Education	
				GE Reflection Seminar	1	*General Education	
	Semester Sum	15		Semester Sum	16		31
						Total Hrs.	121+

* Placement of specific GE courses will vary depending on the student's individual requirements and preferences. Micro prerequisite courses automatically fulfill the following GE categories: Mathematical & Quantitative Reasoning and Natural Science. Where available, honors courses can substitute
 # Major electives include 3-9 hours of Group 1 courses and 0-6 hours of Group 2 courses (9 credits total). Up to 3 hrs of S/U graded courses, including independent research (Micro 4998), can be counted toward the elective requirement.

Sample 3

Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total	
1	Math 1148	4	College Algebra (Prereq for Math)	Math 1149	3	Trigonometry (Prereq for Math)		
	*GE: Lit, Visual, Perf	3	*General Education	Chem 1210	5	Gen Chem 1 (Micro Prereq)		
	*GE: Soc & Behavior	3	*General Education	*GE: Writing	3	*General Education		
	*GE: Just World 1	3	*General Education	*GE: Hist & Cultural	3	*General Education		
	ArtsSci 1100.07	1	College Survey					
	GE Launch Seminar	1	*General Education					
	Semester Sum	15		Semester Sum	14		29	
Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total	
2	Math 1151 or 1156	5	Calculus 1 (Micro Prereq)	Stat 1450 (3) or Stat 2450 (3) or Stat 2480 (3)	3	Introductory Statistics (Micro Prereq)		
	Chem 1220	5	Gen Chem 2 (Micro Prereq)	Chem 2510	4	Org Chem Lect 1 (Micro Prereq)		
	Bio 1113	4	Energy Transfer (Micro Prereq)	Bio 1114	4	Form & Function (Micro Prereq)		
	*GE: Just World 2	3	*General Education	*GE: Foreign Lang 1	4	*General Education		
		Semester Sum	17		Semester Sum	15		32
	Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total
3	Chem 2520	4	Org Chem Lect 2 (Micro Prereq)	Micro 4110	3	Major Core		
	Chem 2540	2	Org Chem Lab 1 (Micro Prereq)	Micro 4130	3	Major Core		
	Micro 4100	5	Major Core	Biochem 4511	4	Major Core		
	*GE: Foreign Lang 2	4	*General Education	*GE: Foreign Lang 3	4	*General Education		
		Semester Sum	15		Semester Sum	14		29
Year	Autumn	Credits	Comment	Spring	Credits	Comment	Year Total	
4	Micro 4120	3	Major Core	Micro 4140	3	Major Core		
	#Micro Elective 1	3	#Major Elective	#Micro Elective 2	3	#Major Elective		
	Physics 1200	5	Physics 1 (Micro Prereq)	#Micro Elective 3	3	#Major Elective		
	*GE: Thematic 1	3	*General Education	*GE: Thematic 2	3	*General Education		
	*GE: Diversity	3	*General Education	GE Reflection Seminar	1	*General Education		
		Semester Sum	17		Semester Sum	13		30
						Total Hrs.	121+	

* Placement of specific GE courses will vary depending on the student's individual requirements and preferences. Micro prerequisite courses automatically fulfill the following GE categories: Mathematical & Quantitative Reasoning and Natural Science. Where available, honors courses can substitute

Major electives include 3-9 hours of Group 1 courses and 0-6 hours of Group 2 courses (9 credits total). Up to 3 hrs of S/U graded courses, including independent research (Micro 4998), can be counted toward the elective requirement.

BS/MS in Microbiology

A combined BS/MS Degree in Microbiology is an opportunity for qualified undergraduates in Microbiology to begin the graduate program in Microbiology during their senior year, with the possibility of completing the Master's degree the following year. Students who are accepted into the Microbiology BS/MS Program are allowed to count 9 semester credit hours of classes toward both the undergraduate and graduate degrees. Applications to this program are accepted from October 1 – March 1. If you are interested in this dual degree program, please talk to the Microbiology advisor.

Eligibility

- Be a Rank 4 student (90 completed credits) in good academic standing (at least 3.5 GPA)
- Have completed MICRBIO 4100[‡], MICRBIO 4120, and BIOCHEM 4511
- Application to the Microbiology BS/MS program in Spring semester of Junior Year
- Admission by the Microbiology Graduate Studies Committee and the OSU Graduate School

[‡] Non-majors who earn an A or an A- in MICRBIO 4000(.01 or .02) can request to enter the Microbiology major without taking MICRBIO 4100. Students who enter the major via MICRBIO 4000 must take 10 credit hours of electives to complete the 30 credit hours required for the BS.

Sample Combined BS/MS Curriculum (Next page)

Year	Credits	Course (title)	GE/open	BS prereq.	BS core	BS elective	MS core	MS elective	MS S/U
1-AU	15	CHEM1210 (Gen Chem I)		5					
		MATH1151 (Calc I)		5					
		BIO1113 (Biology I)		4					
		ASC1100.07 (Survey)	1						
1-SP	15	CHEM1220 (Gen Chem II)		5					
		STATS1450 (Intro)		3					
		BIO1114 (Biology II)		4					
		GE Course	3						
2-AU	16	CHEM2510 (Org Chem I)		4					
		PHYSICS1200 (Physics I)		5					
		GE Courses	7						
2-SP	15	CHEM2520 (Org Chem II)		4					
		CHEM2540 (Org Chem Lab I)		2					
		Open or GE Course	9						
3-AU	16	BIOCHEM4511 (Biochemistry)			4				
		MICRBIO4100 (General/Lab)			5				
		GE course	4						
		GE course	3						
3-SP	15	MICRBIO4110 (Path & Immunology)			3				
		MICRBIO4120 (Microbial Physiology)			3				
		GE or Open Elective(s)	9						
4-AU	16	MICRBIO4130 (Microbial Genetics)			3				
		MICRBIO4140 (Molecular Micro. Lab)			3				
		MICRBIO6020 (Micro Phys & Biochemistry)				3	3		
		MICRBIO7600 (First-year Orientation)							1
		GE course(s)	6						
4-SP	16	MICRBIO5161 (Intro. Comp. Genomics)				3	3		
		MICRBIO6080 (Adv Microbial Genetics)				3	3		
		MICRBIO7899 (Micro Colloquium)							1
		MICRBIO8899 (Seminars)							1

		GE or Open Elective(s)	8					
5-AU	12	MS elective					3	
		MS elective					3	
		MICRBIO6010 (Principles)				2		
		MICRBIO7899 (Colloquium)						1
		MICRBIO8899 (Seminars)						1
		MICRBIO7193 (Research) or MICRBIO7999						2
5-SP	10	MS elective					3	
		MS elective					3	
		MICRBIO7899 (Colloquium)						1
		MICRBIO8899 (Seminars)						1
		(optional) MICRBIO7193 (Research) or MICRBIO7999						2
Total GE/open credits			45					
Total BS prerequisite credits				46				
Total BS core credits					21			
Total BS elective credits						9		
Total BS degree credits = 121								
Total MS degree required credits						11		
Total MS degree elective credits							12	
Total MS degree S/U credits								11
Total MS degree credits = 34								