

Fiscal Unit/Academic Org	Microbiology - D0350
Administering College/Academic Group	Arts And Sciences
Co-administering College/Academic Group	Arts And Sciences
Semester Conversion Designation	Re-envisioned with significant changes to program goals and/or curricular requirements (e.g., degree/major name changes, changes in program goals, changes in core requirements, structural changes to tracks/options/courses)
Current Program/Plan Name	Microbiology
Proposed Program/Plan Name	Microbiology
Program/Plan Code Abbreviation	MICRBIO-BS
Current Degree Title	Bachelor of Science

Credit Hour Explanation

Program credit hour requirements		A) Number of credit hours in current program (Quarter credit hours)	B) Calculated result for 2/3rds of current (Semester credit hours)	C) Number of credit hours required for proposed program (Semester credit hours)	D) Change in credit hours
Total minimum credit hours required for completion of program		40	26.7	30	3.3
Required credit hours offered by the unit	Minimum	26	17.3	20	2.7
	Maximum	35	23.3	26	2.7
Required credit hours offered outside of the unit	Minimum	5	3.3	4	0.7
	Maximum	14	9.3	10	0.7
Required prerequisite credit hours not included above	Minimum	65	43.3	48	4.7
	Maximum	66	44.0	48	4.0

Explain any change in credit hours if the difference is more than 4 semester credit hours between the values listed in columns B and C for any row in the above table

Credit hours have increased for required prerequisites: BIOL, CHEM, MATH AND PHYS.

Program Learning Goals

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

Program Learning Goals

- Goal 1. Students demonstrate proficiency in discipline specific knowledge. Core areas include cell structure, genetics and physiology; microbial diversity and the role of microbes in the environment and in human health and medicine.
- Goal 2. Students demonstrate proficiency in discipline specific experimental skills that allow them to function as experimentalists in the field of Microbiology.
- Goal 3. Students demonstrate proficiency in oral and written skills needed for effective communication of experimental results and scientific principals.

Assessment

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

Is this a degree program (undergraduate, graduate, or professional) or major proposal? Yes

Does the degree program or major have an assessment plan on file with the university Office of Academic Affairs? No

A full assessment plan has been submitting using the survey form

Program Specializations/Sub-Plans

If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

Pre-Major

Does this Program have a Pre-Major? No

Attachments

- Microbiology_BS.pdf: All documents

(Program Proposal. Owner: Daniels, Charles John)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Daniels, Charles John	01/19/2011 11:43 AM	Submitted for Approval
Approved	Daniels, Charles John	01/20/2011 06:51 AM	Unit Approval
Pending Approval	Andereck, Claude David	01/20/2011 06:51 AM	College Approval



Department of Microbiology

484 West 12th Avenue
Columbus, OH 43210-1292

Phone (614) 292-2301
Fax (614) 292-8120

January 19, 2011

Office of Academic Affairs
203 Bricker Hall
190 North Oval Mall
CAMPUS

Re: Microbiology Degree Programs

Dear Colleagues,

The Department of Microbiology offers both undergraduate and graduate degree programs. At the undergraduate level, the department offers BS and BA degrees in Microbiology, and a minor in Microbiology. Through the graduate program the department awards MS and Ph.D. degrees in Microbiology.

The department used the transition to semesters as an opportunity to critically review our curriculum and each of our degree programs. During the 2009-2010 academic year the undergraduate and graduate curriculum committees carried out reviews of their courses and degree requirements. A number of factors were considered in the reviews, these included the responses from student surveys in undergraduate courses, discussions with current graduate students, comparisons of undergraduate and graduate programs at peer institutions, and recommendations from the American Society for Microbiology (ASM). The ASM is the national society for the discipline and its educational branch provides recommendations on the content and scope of microbiology degree programs. We were also guided by comments we received in our recent Unit Review and the review of our graduate program for the recent NRC graduate program review. Final plans for the BS and BA degrees, the minor, and the MS and Ph.D. degrees were approved by unanimous votes at a faculty meetings held on October 29, 2010. Recorded votes were 18 for and 0 against, and no abstentions, for all of the programs.

Both undergraduate and graduate programs have substantive changes in their core requirements and some courses will be revised or have expanded content. Consequently, we are presenting these programs as "re-envisioned".

The key changes in the programs are summarized below.

BS and BA programs:

1. The introductory series, MICRBIOL 520 (5 quarter hrs) and 521 (5 quarter hrs) were merged to a single course, MICRBIOL 5000 (5 semester hrs) with some content reassigned to other courses.
2. The core was expanded from four courses under the quarter system to six courses in semesters. These changes were made to accommodate topics repositioned by the merger of MICRBIOL 520/521 and to ensure the breath of topics that are expected of all microbiology programs.
3. The minor in Microbiology will also use the new foundations course, MICRBIOL 5000, and students will take a subset of the remaining courses in the new core.
4. Course numbers of the quarter successors that are in the semester core have changed to reflect their new relationships; most others have retained similar numbering.


MS and Ph.D. programs:

1. In the re-envisioned graduate programs, students will complete a four-course core prior to completing their candidacy exam; this will include a new course covering general topics related to graduate research and ethics.

2. The remainder of the program, with respect to candidacy exams and research expectations, are essentially unchanged.

We are also preparing for increased advising demands, especially at the undergraduate level. We have developed a transition plan to direct students completing their undergraduate programs in first two years of the transition. As part of the plan, a bridge course will be offered to accommodate students that may be affected by the merger of MICRBIOL 520/521, and staff changes have been put in place to meet the expected increase for advising. An advising plan is also in place for students who will be in the pre-candidacy stage of their graduate programs. Each plan is designed to limit the possibility that a student will be delayed in graduation for reasons other than academic performance.

The department is excited about the new opportunities these changes will bring to our students, and the university community. We look forward to your response.



Tina Henkin, Ph.D.
Professor and Chair
Department of Microbiology



Charles J. Daniels, Ph.D.
Professor
Conversion Coordinator

Rationale: Microbiology BS and BA

Background

Since our last major degree program revisions in 2001, the Department of Microbiology has performed a number of departmental reviews: the Unit Review request in 2007, which included a site visit from an external review committee; a Strategic Plan document for the CBS departmental reviews requested by Dean Platz in 2008, and a review of our graduate programs for the recent NRC graduate program review. Each provided valuable insights, and while we have made some minor changes in our undergraduate courses in the intervening time, we have not had the opportunity to fully incorporate many of the ideas and suggestions we have generated from these reviews. During this time there have also been changes in the faculty; Dr. Henkin has assumed the chair position and we recruited two new faculty members, each bringing new and exciting research areas to the department. Coupled with the fast paced changes in the field of Microbiology, and the increasing demands for our courses, we felt the transition to semesters was an ideal opportunity to review the undergraduate and graduate degree programs.

The review processes were similar for both undergraduate and graduate programs. The undergraduate and graduate studies committees, chaired by Drs. Daniels and Ibba, respectively, met with their members during the 2009-2010 academic year and prepared proposals for review by the full faculty. Our reviews were guided in part by suggestions originating from our internal reviews. We also reviewed the Microbiology programs of peer institutions, and considered the recommendations of the American Society For Microbiology (ASM). The ASM is the national society for the discipline and its educational branch provides recommendations on the content and scope of microbiology degree programs. These recommendations are viewed as benchmarks for undergraduate and graduate degree programs in the field. The faculty reviewed proposals in the autumn quarter of the 2010-2011 academic year. Final plans for the BS and BA degrees and the MS and Ph.D. degrees were approved by unanimous votes at a faculty meetings held on October 29, 2010. Recorded votes were 18 for and 0 against, and no abstentions, for all of the programs. Both undergraduate and graduate programs have substantive changes in their core requirements and some courses will have revised or expanded content. Consequently, we are presenting these programs as re-envisioned.

Revisions to the BS and BA degree programs

Under the quarter system the Microbiology BS degree program requires students to complete 40 hrs in the major. The core includes MICRBIOL 520, 521, 581.01, 581.02 and Biochem 511, totaling 21 hrs. Students complete the major requirements by choosing 19 hrs from electives, which are separated into two groups, Group 1 and Group 2. Group 1 courses are from within the department and students must take 10 hrs from this category. Group 2 courses are offered in allied areas and students can take a maximum of 9 hrs from this category. Student can also use 5 hrs of research, MICRBIOL 699 or independent study, MICRBIOL 693, to fulfill their elective requirement. This program is described in detail in the Major planner and Microbiology Handout that accompany this document.

The re-envisioned plan for the BS degree retains the overall structure; however, we have combined some courses and altered the content of others. As a consequence this has led to an increase in the number of courses in the required core. The BS degree program under semesters will require students to complete 30 hrs in the major. The core will consist of six courses totalling 21 hrs:

MICRBIOL 5000	General Microbiology	5 hrs
MICRBIOL 5010	Pathogenesis and Immunobiology	3 hrs
MICRBIOL 5020	Microbial Physiology and Diversity	3 hrs
MICRBIOL 5030	Microbial Genetics	3 hrs
MICRBIOL 5040	Molecular Microbiology Laboratory	3 hrs
BIOCHEM 5110	Biochemistry	4 hrs

To complete their major requirements students will choose 9 hrs of electives: a minimum of 3 hrs from Group 1 and a maximum of 6 hrs from Group 2. As in the quarter scheme, students will be permitted to use 3 hrs of research, MICRBIOL 5998, or independent study, MICRBIOL 5193, to fulfill their elective requirement.

Microbiology semester core courses: Relationships to quarter predecessors and rational for their inclusion in the core

MICRBIOL 5000, General Microbiology, 5 hrs: This is a new course derived from the merger of MICRBIOL 520 and MICRBIOL 521, General Microbiology I and II. MICRBIOL 5000 will consist of lecture and lab components and serve as the foundation course for the remaining microbiology courses in the core. The merger will require a slight reduction in content (10 quarter hrs to 5 semester hrs), and as a consequence, some content in the areas of physiology and genetics will be moved to MICRBIOL 5020 and MICRBIOL 5030, respectively. The committee also felt that retaining a two semester introductory series, which was a prerequisite to the other core courses, would be too restrictive. This scheme would force many students to take the remaining major courses in their last two semesters. A single foundation course will also serve as an advanced introduction for non-microbiology majors and graduate students in related fields.

MICRBIOL 5010, Pathogenesis and Immunobiology, 3 hrs: This course is a new addition to the core and will contain material from the quarter course MICRBIOL 524.01, Mechanisms of Microbial Disease, and selected material from MICRBIOL 522.01, Immunobiology. These topics are central to modern microbiology and are included in the major programs at nearly all institutions. This course will also provide an advanced introduction to the role of microbes in health and disease, topics important for students planning on postgraduate studies in health sciences.

MICRBIOL 5020, Microbial Physiology and Diversity, 3 hrs. This course is the successor to MICRBIOL 661, Microbial Physiology, and is now included in the core. MICRBIOL 661 was an elective in the quarter scheme; however, with the diversity of organisms that now serve as models systems for physiological and biochemical studies, a solid foundation in physiology is essential for advanced studies in nearly all areas of microbiology. Minor changes in the content are planned to accommodate topics shifted from MICRBIOL 521 and additional topics on diversity will be added.

MICRBIOL 5030, Microbial Genetics, 3 hrs. This course is the successor to MICRBIOL 581.01, Microbial Genetics, and will remain in the core. Some modifications in content will be made to cover topics reallocated from MICRBIOL 520.

MICRBIOL 5040, Molecular Microbiology Laboratory, 3 hrs. This course is the successor to MICRBIOL 581.02, Microbial Genetics Laboratory, and will remain in the core. The main content of the course will remain the same; however, we will modify some experiments to include methods and protocols currently used in MICRBIOL 522.02, Immunobiology Laboratory. MICRBIOL 522.02 will not be carried through in the transition to semesters. MICRBIOL 5040 will now serve as an advanced molecular microbiology laboratory. Decoupling the laboratory from the Genetics and Immunobiology lecture courses will provide the opportunity to incorporate new experiments and emerging technologies.

This newly designed curriculum covers the core areas of microbiology and will provide a strong foundation for students preparing them for careers as microbiologists or for further studies in graduate or professional schools. A comprehensive core also supports our learning goals and will enhance our ability to assess and improve our program.

Semester Courses: Microbiology BS

Required Prerequisites for the Major

Semester Course Number	Course Title	Semester Hrs.	Status Under Quarters	Quarter Equivalent Course	Quarter Hrs.	Notes
BIOL 1113	Biological Sciences: Energy Transfer and Development	4	Required Preq.	BIOL 113	5	
BIOL 1114	Biological Sciences: Form, Function, Diversity, and Ecology	4	Required Preq.	BIOL 114	5	
MATH 1151	Calculus 1	5	Required Preq.	MATH 150,151,152	15	
MATH 1152	Calculus 2	5	Required Preq.	"		
CHEM 1210	General Chemistry 1	5	Required Preq.	CHEM 121,122,123	15	
CHEM 1220	General Chemistry 2	5	Required Preq.	"		
CHEM 2510	Organic Chemistry 1	4	Required Preq.	CHEM 251,252	8	
CHEM 2520	Organic Chemistry 2	4	Required Preq.	"		
CHEM 2540	Organic Chemistry Lab 1	2	Required Preq.	CHEM 245	2	CHEM 254 3hr QHrs. Option
PHYS 1200	Mechanics, Thermal Physics, Waves	5	Required Preq.	PHYS 111,112,113	15	
PHYS 1201	E&M, Optics, Modern Physics	5	Required Preq.	"		
	Total Hrs.	48		Total Hrs.	65	

Required Core for the Major

Semester Course Number	Course Title	Semester Hrs.	Status Under Quarters	Quarter Equivalent Course	Quarter Hrs.	Notes
MICRBIOL 5000	General Microbiology	5	Required Core	MICRBIOL 520,521	10	Combined aspects of 520 and 521; some content moved to 5020, 5030 and 5040
MICRBIOL 5010	Pathogenesis and Immunobiology	3		MICRBIOL 524.01	4	524.01 with some content from 522.01
MICRBIOL 5020	Microbial Physiology and Diversity	3		MICRBIOL 661	5	661 with some content from 521; remove redundancies
MICRBIOL 5030	Microbial Genetics	3	Required Core	MICRBIOL 581.01	3	581.01 with some content from 520
MICRBIOL 5040	Molecular Microbiology Laboratory	3	Required Core	MICRBIOL 581.02	3	581.02 with some content from 522.02
BIOCHEM 5110	Biochemistry	4	Required Core	BIOCHEM 511	5	Increased content determined by BIOCHEM
	Total Hrs.	21		Total Hrs.	21	

Electives: Total Required 9 hrs
Group 1: 3-9 hrs

Semester Course Number	Course Title	Semester Hrs.	Status Under Quarters	Quarter Equivalent Course	Quarter Hrs.	Notes
MICRBIOL 3194	Group Studies	1-3		MICRBIOL 294	1-5	Direct conversion
MICRBIOL 4591S	DNA Finger Printing Workshops in Columbus PS	1		MICRBIOL 591	2	Direct conversion
MICRBIOL 5161H	Bioinformatics and Molecular Microbiology	3		MICRBIOL 610H	5	Direct conversion
MICRBIOL 5122	Immunology	2		MICRBIOL 5122	3	Direct conversion
MICRBIOL 5129	Cellular and Molecular Biology of Pathogenic Eukaryotes	3		MICRBIOL 629	5	Direct conversion
MICRBIOL 5536	Food Microbiology Lecture	3		MICRBIOL 636.01	3	Increased content
MICRBIOL 5546	Food Microbiology Laboratory	3		MICRBIOL 636.02	3	Increased content
MICRBIOL 5147	Eukaryotic Pathogens	3		MICRBIOL 647	3	Increased content
MICRBIOL 5149	Introductory Virology	3		MICRBIOL 649	5	Direct conversion
MICRBIOL 5150	Microbial Ecology	3		MICRBIOL 664	3	Increased content
MICRBIOL 5155	Environmental Microbiology	3		MICRBIOL 665	3	Increased content
MICRBIOL 5169H	Microbial Evolution	3		MICRBIOL 669H	5	Direct conversion
MICRBIOL 5170	Microbes and Evolution	3		n/a	n/a	New course proposal
MICRBIOL 5193	Individual Studies	1-3		MICRBIOL 693	1-5	Direct conversion
MICRBIOL 5194	Group Studies	1-3		MICRBIOL 694	1-5	Direct conversion
MICRBIOL 5797	Study at a Foreign Institution	1-19		MICRBIOL 697	1-15	Direct conversion
MICRBIOL 5798	Study Tour Domestic	1-19		MICRBIOL 698.01	1-15	Direct conversion
MICRBIOL 5998	Undergraduate Research in Microbiology	1-5		MICRBIOL 699	1-5	Direct conversion
MICRBIOL 5998H	Honors Research	1-5		MICRBIOL 783H	1-5	Direct conversion
MICRBIOL 6080*	Advanced Microbial Genetics	3		MICRBIOL 680	3	Increased content
MICRBIOL 7020*	Physiology Meets Pathogenesis	2		MICRBIOL 702	3	Direct conversion
MICRBIOL 7010*	Cellular and Molecular Immunology	3		MICRBIOL 701	5	Direct conversion
MICRBIOL 6020*	Microbial Physiology and Biochemistry	3		MICRBIOL 720	4	Direct conversion
MICRBIOL 7023*	Molecular Immunology: Lecture	3		MICRBIOL 723.01	3	Increased content
MICRBIOL 7024*	Advanced Molecular Pathogenesis	3		MICRBIOL 724	5	Direct conversion
MICRBIOL 7036*	Advanced Food Microbiology	3		MICRBIOL 736	3	Increased content
MICRBIOL 7050*	Fermentation Biotechnology	3		MICRBIOL 750	5	Direct conversion
MICRBIOL 7060*	Advanced Topics in Molecular Microbiology	2		MICRBIOL 760	3	Direct conversion
MICRBIOL 788Y*	Host-Pathogen Interactions: Research Seminar	1		MICRBIOL 795	1	Direct conversion
MICRBIOL 789Y*	Microbiology Colloquium	1		MICRBIOL 799	1	Direct conversion
	Total Hrs.	3-9		Total Hrs.	10-19	

Semester Courses: Microbiology BS

Electives: Total Required 9 hrs
Group 2: 0-6 hrs

Semester Course Number	Course Title	Semester Hrs.	Status Under Quarters	Quarter Equivalent Course	Quarter Hrs.	Notes
MICRBIOL 2300	The Biology of Pollution	2		MICRBIOL 301	2	Increased content
BIOCHEM 521#	Intro Biological Chemistry Laboratory	4		BIOCHEM 521	5	Increased content determined by BIOCHEM
MOLGEN 500#	General Genetics	3		MOLGEN 500	5	Direct conversion
MOLGEN 605#	Molecular Genetics I	3		MOLGEN 605	4	Direct conversion
MOLGEN 606#	Molecular Genetics II	3		MOLGEN 606	4	Direct conversion
MVIMG 600#	Evolution of Emerging Viruses	1		MVIMG 600	2	Direct conversion
PLPATH 600#	Bacterial and Viral Pathogens of Plants	2		PLPATH 600	3	Direct conversion
PLPATH 602#	Plant-Microbe Interactions	2		PLPATH 602	3	Direct conversion
PLPATH 660#	Mycology	3		PLPATH 660	5	Direct conversion
ANSCI 690#	Anaerobic Microbiology	3		ANSCI 690	5	Direct conversion
ENR 665#	Biology of Soil Ecosystems	3		ENR 665	4	Direct conversion
	Total Hrs.	0-6		Total Hrs.	0-9	
	Total Hrs. for the Major	30		Total Hrs. for the Major	40	

Designates TBA semester successor number
*Available to advanced undergraduates with instructor's permission

Learning Goals Microbiology BS

Required Prerequisites for the Major

Learning Goals

Semester Course Number	Course Title	Semester hrs	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2
BIOL 1113	Biological Sciences: Energy Transfer and Development	4	B	B	B	B				
BIOL 1114	Biological Sciences: Form, Function, Diversity, and Ecology	4	B	B	B	B				
MATH 1151	Calculus 1	5	B							
MATH 1152	Calculus 2	5	B							
CHEM 1210	General Chemistry 1	5	B							
CHEM 1220	General Chemistry 2	5	B							
CHEM 2510	Organic Chemistry 1	4	B							
CHEM 2520	Organic Chemistry 2	4	B							
CHEM 2540	Organic Chemistry Lab 1	2	B			B				
PHYS 1200	Mechanics, Thermal Physics, Waves	5	B			B				
PHYS 1201	E&M, Optics, Modern Physics	5	B			B				
	Total Hrs.	48								

Goal: B: Beginning; I, Intermediate; A, Advanced

Required Core for the Major

Learning Goals

Semester Course Number	Course Title	Semester hrs	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2
MICRBIOL 5000	General Microbiology	5	I	I	I	I	I	I	I	I
MICRBIOL 5010	Pathogenesis and Immunobiology	3			A			A		
MICRBIOL 5020	Microbial Physiology and Diversity	3	A	A				A		
MICRBIOL 5030	Microbial Genetics	3	A		I			A		
MICRBIOL 5040	Molecular Microbiology Laboratory	3	I	I	I	A	A	A	A	A
BIOCHEM 5110	Biochemistry	4	I	I						
	Total Hrs.	21								

Goal: B: Beginning; I, Intermediate; A, Advanced

Electives: Total Required 9 hrs

Group 1: 3-9 hrs

Learning Goals

Semester Course Number	Course Title	Semester hrs	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2
MICRBIOL 3194	Group Studies	1-3								
MICRBIOL 4591S	DNA Finger Printing Workshops in Columbus PS	1	B		B	B	B		B	
MICRBIOL 5161H	Bioinformatics and Molecular Microbiology	3	A	A			A	A	A	A
MICRBIOL 5122	Immunology	2			A			A		
MICRBIOL 5129	Cellular and Molecular Biology of Pathogenic Eukaryotes	3	I	I	A			A		
MICRBIOL 5536	Food Microbiology Lecture	3		A	I					
MICRBIOL 5546	Food Microbiology Laboratory	3		A	I		A	A	A	A
MICRBIOL 5147	Eukaryotic Pathogens	3						A		
MICRBIOL 5149	Introductory Virology	3	A		A					
MICRBIOL 5150	Microbial Ecology	3	I	A				A		
MICRBIOL 5155	Environmental Microbiology	3	I	A				A		
MICRBIOL 5169H	Microbial Evolution	3	A	A				A		
MICRBIOL 5170	Microbes and Evolution	3	A	A				A		
MICRBIOL 5193	Individual Studies	1-3								
MICRBIOL 5194	Group Studies	1-3								
MICRBIOL 5797	Study at a Foreign Institution	1-19								
MICRBIOL 5798	Study Tour Domestic	1-19								
MICRBIOL 5998	Undergraduate Research in Microbiology	1-5					A			
MICRBIOL 5998H	Honors Research	1-5								
MICRBIOL 6080*	Advanced Microbial Genetics	3	A					A		
MICRBIOL 7020*	Physiology Meets Pathogenesis	2	A		A			A		
MICRBIOL 7010*	Cellular and Molecular Immunology	3						A		
MICRBIOL 6020*	Microbial Physiology and Biochemistry	3	A					A		
MICRBIOL 7023*	Molecular Immunology: Lecture	3			A			A		
MICRBIOL 7024*	Advanced Molecular Pathogenesis	3	I		A			A		
MICRBIOL 7036*	Advanced Food Microbiology	3	I	A	A			A		
MICRBIOL 7050*	Fermentation Biotechnology	3	I				A	A	A	A
MICRBIOL 7060*	Advanced Topics in Molecular Microbiology	2	A					A		
MICRBIOL 788Y*	Host-Pathogen Interactions: Research Seminar	1	I		A			A		
MICRBIOL 789Y*	Microbiology Colloquium	1								
	Total Hrs.	3-9								

Goal: B: Beginning; I, Intermediate; A, Advanced

Learning Goals Microbiology BS

Electives: Total Required 9 hrs
Group 2: 0-6 hrs

Learning Goals

Semester Course Number	Course Title	Semester hrs	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2
MICRBIOL 2300	The Biology of Pollution	2		B	B					
BIOCHEM 521#	Intro Biological Chemistry Laboratory	4	B			I				
MOLGEN 500#	General Genetics	3	I							
MOLGEN 605#	Molecular Genetics I	3	A							
MOLGEN 606#	Molecular Genetics II	3	A							
MVIMG 600#	Evolution of Emerging Viruses	1	A		A					
PLPATH 600#	Bacterial and Viral Pathogens of Plants	2	I		A					
PLPATH 602#	Plant-Microbe Interactions	2	I	I	A		A			
PLPATH 660#	Mycology	3	I	I	A		A			
ANSCI 690#	Anaerobic Microbiology	3	I	A						
ENR 665#	Biology of Soil Ecosystems	3	I	A						
	Total Hrs.	0-6								
	Total Hrs. for the Major	30								

Designates TBA semester successor number

*Available to advanced undergraduates with instructor's permission

Goal: B: Beginning; I, Intermediate; A, Advanced

Learning Goals Microbiology BS

Goal 1. Students demonstrate proficiency in discipline specific knowledge. Core areas include cell structure, genetics and physiology; microbial diversity and the role of microbes in the environment; and the role of microbes in human health and medicine.

Objective 1.1

Cell structure, genetics and physiology. Students understand: the relationship of chemical, physical and mathematical principals as they apply to cellular processes; the relationship between cellular structures and their functions; the structure of genes, their replication and the transfer of genetic information between organisms; the synthesis of macromolecules and the regulation of gene expression; the importance of energy conservation in catabolic and anabolic reactions; and the diversity of metabolism among microorganisms.

Objective 1.2

Microbial diversity and the role of microbes in the environment. Students understand: the principals of modern evolutionary theory and the relationship between bacterial, archaeal and eukaryal cells; the ecology of microbial organisms and how they adapt to their environment; how microbes impact their environment as positive or negative agents, including the use of microbes to solve environmental problems; the role of microbes in industrial and food processes and their applications in biomedical treatment and research.

Objective 1.3

Microbes in human health and medicine. Students understand: that microbes and viruses play integral roles in both maintaining normal health and in disease processes of humans, animals and plants; the molecular mechanisms of microbial pathogenesis and how pathogens differ in key physiological and genetic processes from non-pathogenic organisms; and the host's immune response to challenges by microbial or viral agents.

Goal 2. Students demonstrate proficiency in discipline specific experimental skills that allow them to function as experimentalists in the field of Microbiology.

Objective 2.1.

Basic microbial techniques. Students understand the basis of the scientific method and hypothesis testing; they develop competence in basic aseptic techniques, growth of microbial cells, the use of light microscopy to view and interpret slides, the identification of microorganisms based on morphology, differential growth, physiological properties and rRNA profiles, the application of spectroscopic methods in measuring growth and in the quantification of small molecules in enzyme assays, use of serial dilutions techniques in estimating the number of microbes, proper use of standard laboratory equipment, and error measurements. Students also demonstrate ability to explain and practice safe microbiological procedures for handling microbes, proper waste disposal, and protective and emergency procedures.

Objective 2.2.

Specialized techniques and modern molecular biological methods. Students demonstrate the ability to isolate, separate and characterize nucleic acids (DNA and RNA) and proteins from microbial cells. Students understand and carryout advanced molecular biological and immunological techniques including site-specific and transposon mutagenesis, DNA sequence analysis, use of bioinformatics tools, DNA hybridization, gene cloning, fluorescence microscopy, antigen-antibody interactions, western blotting, enzyme-linked immunoassay and immunofluorescence.

Objective 2.3

Critical thinking. Students demonstrate that they can organize and interpret scientific data from multiple sources, raise questions about the data and formulate meaningful conclusions.

Goal 3. Students demonstrate proficiency in oral and written skills needed for effective communication of experimental results and scientific principals.

Objective 3.1

Data presentation. Students demonstrate that they can organize and present scientific data in graphical and verbal modes that is accurate and comprehensible.

Objective 3.2

Written presentations in standard scientific format. Students demonstrate that they can summarize important information from current scientific literature and that they can present findings from laboratory studies in standard scientific format.

Transition Plan:

We anticipate that special accommodations will be required for some students since we are converting a two quarter sequence, MICRBIOL 520 and MICRBIOL 521, to a one semester course, MICRBIOL 5000, and that we are changing the core requirements for the BS and BA degrees under semesters. The student's needs are central to our plans and we have designed schemes that will minimize the possibility that any student will be delayed in graduation for reasons other than their academic performance in the major. In anticipation of this situation Ms. Linda Saville-Rath, our undergraduate advisor, has begun to contact our current majors as well as freshman and sophomore students who have declared Microbiology as their major. Ms. Saville-Rath has realigned her duties for this transition period and will serve as the primary contact for students in their planning.

We have defined a number of general policy items for the students in transition, and we will offer a bridge course for students who have not completed MICRBIOL 521, the second course in the introductory sequence. We hope to reduce the demand for the bridge course by advising students to complete the series during the 2011-2012 academic year, or to postpone taking MICRBIOL 520 in the spring quarter preceding the switch to semesters. Our plans are outlined below and modifications in the core course requirements are presented in the accompanying table.

1. Students who have begun the Microbiology core curriculum under the quarter system will have the option to complete their degree using the guidelines set forth under the quarter system. Specifically, they will be required to complete those courses, or their successors, defined as the core under quarter system. These include: MICRBIOL 5194 (if needed); MICRBIOL 5030, Microbial Genetics; MICRBIOL 5040, Molecular Microbiology Laboratory; BIOCHEM 5110, Biochemistry. These students will not be required to take MICRBIOL 5010, Pathogenesis and Immunobiology and MICRBIOL 5020, Microbial Physiology and Diversity, required in the semester scheme; however, they will be encouraged to take them as electives. These relationships are outlined in the accompanying table, which will also be used as one of the tools for advising students during the transition period.
2. Using the two-thirds scaling for the credit transition from quarters to semesters, the Microbiology core requirements will be set at 27 semester hr equivalents for students during the transition period. This reflects the transition for a 40 quarter hrs core; namely, 26.7 semester hrs. We realize this is the minimum and this total is below what will be required under semesters; however, we don't see this as diluting the curriculum since many of our majors will choose to take additional classes in the major or allied areas.
3. We will offer a bridge course, MICRBIOL 5194, which will serve students that have taken MICRBIOL 520, but not MICRBIOL 521. The course will consist of both lecture and lab components and will bring these students into alignment with those that have completed either the quarter sequence or the semester successor, MICRBIOL 5000. We project a maximum of 75 students and we anticipate that students within this group, who are in good academic standing, will complete the bridge course in the first semester. The bridge course will also be offered in the following autumn semester. Beyond this point, we will consider students' needs on an individual basis.
4. Students taking the bridge course in Au 2010 will be permitted to enroll in other courses except MICRBIOL 5020, Microbial Physiology and Diversity, which requires MICRBIOL 521 as a prerequisite.
5. To accommodate students who may require 1-2 semester hrs for graduation in 2012-2013, and who might experience undue hardship if forced to take an additional 3 semester hr course, we will offer a specific section of MICRBIOL 5193, Individual Studies. A faculty member will coordinate the course, directing student interactions with specific faculty members as needed. We will also review, on an as needed basis, requests for substitution in the Group 2 course category.

Transition Plan Microbiology BS

Core Quarter Courses Completed	Course Description	Quarter hrs Completed	Semester hrs Equivalent	Semester Core Course	Course Description	Semester hrs
MICRBIOL 520	General Microbiology I	5	3.3	MICRBIOL 5194	General Microbiology-Bridge	3
				MICRBIOL 5030	Microbial Genetics	3
				MICRBIOL 5040	Molecular Microbiology Laboratory	3
				BIOCHEM 5110	Biochemistry	4
				Quarter carryover		3
				Semester Electives*	Group 1 (3-13)/Group 2 (0-6)	11
Total in major						27

Core Quarter Courses Completed	Course Description	Quarter hrs Completed	Semester hrs Equivalent	Semester Core Course	Course Description	Semester hrs
MICRBIOL 520	General Microbiology I	5	3.3	MICRBIOL 5194	General Microbiology-Bridge	0
MICRBIOL 521	General Microbiology II	5	3.3	MICRBIOL 5030	Microbial Genetics	3
				MICRBIOL 5040	Molecular Microbiology Laboratory	3
				BIOCHEM 5110	Biochemistry	4
				Quarter carryover		7
				Semester Electives	Group 1 (3-13)/Group 2 (0-6)	10
Total in major						27

Core Quarter Courses Completed	Course Description	Quarter hrs Completed	Semester hrs Equivalent	Semester Core Course	Course Description	Semester hrs
MICRBIOL 520	General Microbiology I	5	3.3	MICRBIOL 5194	General Microbiology-Bridge	0
MICRBIOL 521	General Microbiology II	5	3.3	MICRBIOL 5030	Microbial Genetics	0
MICRBIOL 581.01	Microbial Genetics	3	2.0	MICRBIOL 5040	Molecular Microbiology Laboratory	3
				BIOCHEM 5110	Biochemistry	4
				Quarter carryover		9
				Semester Electives	Group 1 (3-13)/Group 2 (0-6)	11
Total in major						27

Core Quarter Courses Completed	Course Description	Quarter hrs Completed	Semester hrs Equivalent	Semester Core Course	Course Description	Semester hrs
MICRBIOL 520	General Microbiology I	5	3.3	MICRBIOL 5194	General Microbiology-Bridge	0
MICRBIOL 521	General Microbiology II	5	3.3	MICRBIOL 5030	Microbial Genetics	0
MICRBIOL 581.01	Microbial Genetics	3	2.0	MICRBIOL 5040	Molecular Microbiology Laboratory	0
MICRBIOL 581.02	Microbial Genetics Laboratory	3	2.0	BIOCHEM 5110	Biochemistry	4
				Quarter carryover		11
				Semester Electives	Group 1 (3-13)/Group 2 (0-6)	12
Total in major						27

Core Quarter Courses Completed	Course Description	Quarter hrs Completed	Semester hrs Equivalent	Semester Core Course	Course Description	Semester hrs
MICRBIOL 520	General Microbiology I	5	3.3	MICRBIOL 5194	General Microbiology-Bridge	0
MICRBIOL 521	General Microbiology II	5	3.3	MICRBIOL 5030	Microbial Genetics	0
MICRBIOL 581.01	Microbial Genetics	3	2.0	MICRBIOL 5040	Molecular Microbiology Laboratory	0
MICRBIOL 581.02	Microbial Genetics Laboratory	3	2.0	BIOCHEM 5110	Biochemistry	0
BIOCHEM 511	Biochemistry	5	3.3	Quarter carryover		14
				Semester Electives	Group 1 (3-13)/Group 2 (0-6)	13
Total in major						27

*Students are required to complete 19 hrs of electives under quarters. This is minimally met with four courses. Under semesters the most advanced transition student will need to take four classes to meet their elective requirement.

**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	5	GE-Math/Micro-PreRec	Math 1152	5	Micro-PreRec	
	Bio 1113	4	GE-BioSci/Micro-PreRec	Bio 1114	4	Micro-PreRec	
	Freshman Survey	1	GE	GE Writing 1	3	GE	
	Semester Sum	15		Semester Sum	17		32
2	Org Chem 2510	4	Micro-PreRec	Org Chem 2520	4	Micro-PreRec	
	GE-Literature	3	GE	Org Chem Lab 2540	2	Micro-PreRec	
	GE Writing 2	3	GE	GE-Language 1	4	GE	
	Physics 1200	5	Micro-PreRec	Physics 1201	5	Micro-PreRec	
	Semester Sum	15		Semester Sum	15		30
3	Micro 5000	5	Micro-Core	Micro 5010	3	Micro-Core	
	BioChem 5110	4	Micro-Core	Micro 5020	3	Micro-Core	
	GE-Language 2	4	GE	GE-History	3	GE	
	GE Social Sci 2	3	GE	Micro Elective 1	3	Micro-Required	
	Semester Sum	16		Semester Sum	15		31
4	Micro 5030	3	Micro-Core	Micro-Free	3		
	Micro 5040	3	Micro-Core	Micro-Free	3		
	GE-Option 2	3	GE	Micro-Free	3		
	Micro Elective 2	3	Micro-Required	GE Culture&Ideas	3	GE	
	Micro Elective 3	3	Micro-Required	GE-Arts	3	GE	
Semester Sum	15		Semester Sum	15		30	
						Total Hrs.	123

Placement of GE electives in specific semesters are for illustrative purposes. Choices will vary depending on the student's individual requirements and preferences.

MICROBIOLOGY MAJOR INFORMATION (For Semesters)**Department of Microbiology**

376 Biosciences Building, 484 West 12th Avenue; Columbus, OH 43210

Tel: (614) 292-2301; Fax: (614) 292-8120

<http://microbiology.osu.edu/>

<p>Department Chair: Dr. Tina Henkin 376 BioSci Bldg. 614-292-2301 Henkin.3@osu.edu</p>	<p>Honors Advisor: Dr. Olli Tuovinen 452 BioSci. Bldg. 614-292-3379 Tuovinen.1@osu.edu</p>
<p>Coordinating Advisor: Ms. Linda Saville-Rath 280 BioSci. Bldg. 614-292-0509 Saville-rath.1@osu.edu</p>	<p>Coordinator Undergraduate Research: Dr. Kurt Fredrick 286 Aronoff 614-292-6679 Fredrick.5@osu.edu</p>

Required Prerequisites or Supplements to the Major

These courses do NOT count toward the Major. Some of them are prerequisites for required major courses. All of them must be completed prior to graduation. *General education (GE) course requirements are not included in this list. Please see your Arts and Sciences Academic Advisor (ASC AA) for a list of GE requirements. You can contact an ASC AA by calling 614-292-6961.*

• Biology 1113, 1114	8 hr.
• Mathematics 1151, 1152	10 hr.
• Chemistry 1210, 1220	10 hr.
• Chemistry 2510, 2520, 2540	10 hr.
• Physics 1200, 1201	10 hr.

****Additional organic chemistry courses may be required or suggested for pre-professional students. See an ASC AA pre-professional advisor for further information.***

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 (see next page). The other 9 hours of the major are elective courses.

The elective courses are broken down into two groups: Group 1 and Group 2. Students must take at least 3 hr. of Group 1 courses and may take all 9 elective hours from Group 1. Students are not required to take any Group 2 courses but may have up to 6 hr. from this group count as elective hours. Please discuss with your major advisor any courses NOT listed in Group 2 that you would like to include in your major.

Three semester hours graded S/U, usually earned through Individual Study, Undergraduate Research or Honors Research (Microbiology 5193, 5998, or 5998H) may be counted toward the Microbiology Major. These courses may be scheduled by contacting any faculty member in the department. You may also discuss your research options with the Coordinator of Undergraduate Research. Other major elective courses graded S/U are Microbiology 4591S and 789Y. Remember, you can count ONLY 3 elective hours total from the courses graded S/U.

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

Microbiology 4000 may be taken as an introduction to microbiology. However, credit gained for Microbiology 4000 does NOT count toward the 30 semester hours required for the Microbiology Major.

Microbiology Major Core Courses—21 Hours of **REQUIRED COURSES**

Department #	Credit Hours	Course Title (Semester taught)	Prerequisites	Instructor
Biochemistry 5110	4	Introduction to Biological Chemistry (Au and Sp)	Biology 1114, Chemistry 1220	Contact BioChem Dept. at 292-6771
Microbiology 5000	5	General Microbiology (Au and Sp)	Biology 114 or H116	TBD*
Microbiology 5010	3	Pathogenesis and Immunobiology (TBD)	Microbiology 5000 (C- or better)	TBD
Microbiology 5020	3	Microbial Physiology and Diversity (TBD)	Microbiology 5000 (C- or better)	TBD
Microbiology 5030	3	Microbial Genetics (TBD)	Microbiology 5000 (C- or better)	TBD
Microbiology 5040	3	Molecular Microbiology Laboratory (Au and Sp)	Microbiology 5000 (C- or better)	K. Sandman

*TBD= to be determined

Microbiology Major Courses—**ELECTIVE COURSES, GROUP 1:**

Take 3-9 hr. from this group

Micro. Course No.	Credit Hours	Course Title (Semester taught)	Prerequisites	Instructor
5122	2	Immunobiology (TBD)	C- or better in either Microbiology 4000 or 5000	A. Satoskar & J. Kwiek
4591S	1 <i>Graded S/U</i>	DNA Fingerprinting; Service learning course (TBD)	Students present workshops at Columbus Public High Schools;	A. Simcox
516H	3	Bioinformatics and Molecular Microbiology (<i>offered infrequently</i>)	Microbiology 5030 or Molecular Genetics 605#, and Biochemistry 5110; or permission of instructor	C. Daniels
5129	3	Cellular and Molecular Biology of Pathogenic Eukaryotes (TBD)	Microbiology 5000 or permission of instructor	J. Alfonzo
5536	3	Food Microbiology Lecture (Au, Sp)	C- or better in either Microbiology 4000 or 5000	A. Yousef
5546	3	Food Microbiology Laboratory (Au, Sp)	Microbiology 5536 (or concurrent with)	A. Yousef
5147	3	Eukaryotic Pathogens (TBD)	Microbiology 5000 (C- or better); or Molecular Genetics 500# or 605#; or Biochemistry 5110	C. Rappleye
5149	5	Introductory Virology (Sp)	Microbiology 5000 (C- or better)	M. Williams
5150	3	Microbial Ecology (TBD)	C- or better in Microbiology 4000 or equivalent	O. Tuovinen
5155	3	Environmental Microbiology (TBD)	C- or better in Microbiology 4000 or equivalent	O. Tuovinen
5169H	3	Microbial Evolution (TBD)	6 semester hours of biological sciences course work	S. Abedon
5170	3	Microbes and Evolution (TBD)	TBD	S. Abedon
5193 5998 5998H	1-3 <i>Graded S-U</i>	Individual Studies (Au,Sp,Su) Undergraduate Research (Au,Sp,Su) Honors Research (Au,Sp,Su)	Permission of instructor. Maximum of 3 credit hours for any combination of these courses can be counted toward the Major.	Contact individual faculty member or Dr. Fredrick

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	Instructor
6020	3	Microbial Physiology and Biochemistry	TBD	TBD
6080	3	Advanced Microbial Genetics (TBD)	Microbiology 5030 or Molecular Genetics 500# or 605#	I. Artsimovitch
7010	3	Cellular and Molecular Immunology (TBD)	Biochemistry 613#, Molecular Genetics 500# or 605#	A. Satoskar, et al
7020	3	Microbial Physiology Meets Pathogenesis (TBD)	Permission of instructor	T. Henkin & D. Wozniak
7023	3	Molecular Immunology	TBD	TBD
7024	3	Advanced Molecular Pathogenesis (TBD)	Permission of instructor	R. Munson, et al
7036	3	Advanced Food Microbiology (TBD)	Microbiology 5536 and Chemistry 1220	H. Wang
7060	3	Advanced Topics in Molecular Microbiology (TBD)	Microbiology 5020 or permission of instructor	J. Krzycki, et al
789Y	¹ Graded S/U	Microbiology Colloquium (Au,Sp)	Repeatable for maximum of 2 credit hours.	B. Ahmer

Microbiology Major Courses—ELECTIVE COURSES, GROUP 2:
Take 0-9 hr. from this group

Department #	Credit Hours	Course Description (Quarters taught)	Prerequisites
Microbiology 2300	2	The Biology of Pollution (Au)	4 credit hours of biology
Biochemistry 521#	4	Introduction to Biological Chemistry Laboratory (TBD)	Biochemistry 5110 or 613# or equivalent
Molecular Genetics 500#	3	General Genetics (Au,Sp,Su)	Biology 1113 and 5 additional hours in biological sciences
Molecular Genetics 605#	3	Molecular Genetics I (TBD)	Biochemistry 5110 and Mathematics 1152
Molecular Genetics 606#	3	Molecular Genetics II (TBD)	Molecular Genetics 605#
MVIMG 600#	1	Evolution of Emerging Viruses (TBD)	2 years of course work in the biological sciences suggested
Plant Pathology 600#	2	Bacterial and Viral Pathogens of Plants (TBD)	Plant Pathology 401# or Microbiology 5000, or permission of instructor
Plant Pathology 602#	2	Plant-Microbe Interactions (TBD)	Plant Pathology 401#, Biochemistry 5110, or Microbiology 4000 or permission of instructor
Plant Pathology 660#	3	Mycology (TBD)	Biology 1114 or Plant Pathology 300# or 401#
Animal Science 690#	3	Anaerobic Microbiology (TBD)	Microbiology 5000 and Biochemistry 5110
Envir. & Natural Resources 665#	3	Biology of Soil Ecosystems (TBD)	ENR 300# or 301#, or permission of instructor with Micro 5000



Major Program Form

College of the Arts and Sciences

Name

Last, First, Middle

Major **MICROBIOLOGY**

Name #: _____

Degree Sought: BA BS

Local Address

(Zip)

Phone: resident

Expected Date of Graduation

(Semester and Year)

business

Email Address

Have you filed a degree application in the College of Arts and Sciences: Yes No

(Note: This form is **NOT** A degree application.)

If completing two majors, list both below and file a separate form for each one:

1) _____

2) _____

Part A. Required Prerequisites (and/or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 1151/1152	10		Chemistry 2510/2520	8	
Physics 1200/1201	10		Chemistry 2540	2	
Biology 1113/1114	10				

Part B. Major Program (Minimum grade of "C-" required. Minimum grade of "C" (2.00))

Core Requirements (Substitutions are rarely if ever permitted)

Courses	Hours	Grade
Micro 5000	5	
Micro 5010	3	
Micro 5020	3	
Micro 5030	3	
Micro 5040	3	
BioChem 5110	4	

Additional Elective Major Program Courses

GROUP 1 (3-9 hr.)			GROUP 2 (0-6 hr.)		
Courses	Hours	Grade	Courses	Hours	Grade

Total of Part B only:

Check whether this is: original revision

Distribution: One copy each – Faculty advisor

Student

College Office, Denny Hall

Signature of faculty adviser

Linda Saville-Rath

Name of Faculty Adviser (Please Print)

Microbiology

Department

Date

2-0509

Campus Phone

MICROBIOLOGY MAJOR INFORMATION

Department of Microbiology

376 Biosciences Building, 484 West 12th Avenue; Columbus, OH 43210

Tel: (614) 292-2301; Fax: (614) 292-8120

<http://www.osumicrobiology.org/>

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<p>Coordinating Advisor: Ms. Linda Saville-Rath 280 BioSci. Bldg. 614-292-0509 Saville-rath.1@osu.edu</p>	<p>Coordinator Undergraduate Research: Dr. Kurt Fredrick 286 Aronoff 614-292-6679 Fredrick.5@osu.edu</p>

Required Prerequisites or Supplements to the Major

These courses do NOT count toward the Major. Some of them are prerequisites for required major courses. All of them must be completed prior to graduation. *General education course (GEC) requirements are not included in this list. Please see your Arts and Sciences Academic Advisor (ASC AA) for a list of GEC requirements. You can contact an ASC AA by calling 614-292-6961.*

• Biology 113, 114 (or H115, H116)	10 hr.
• Mathematics 148, 150, 151, 152 (or equivalent)	19 hr.
• Chemistry 121, 122, 123	15 hr.
• Chemistry 251, 252 and 245 or 254*	10-11 hr.
• Physics 111, 112, 113 (or 131, 132, 133)	15 hr.

***Additional organic chemistry courses may be required or suggested for pre-professional students. For example, it is suggested that pre-med students also take Chem 253 and two organic chemistry labs. See an ASC AA pre-professional advisor for further information.**

Microbiology Major Courses—General Information

The Microbiology Major consists of a minimum of 40 credit hours. Required courses make up 21 of these 40 hours. All students must complete Microbiology 520, 521, 581.01, 581.02 and Biochemistry 511. The other 19 hours of the major are elective courses.

The elective courses are broken down into two groups: Group 1 and Group 2. Students must take at least 10 hr. of Group 1 courses and may take all 19 elective hours from Group 1. Students are not required to take any Group 2 courses but may have up to 9 hr. from this group count as elective hours. Please discuss with your major advisor any courses NOT listed in Group 2 that you would like to include in your major.

Five credit hours graded S/U, usually earned through Individual Study, Undergraduate Research or Honors Research (Microbiology 693, 699, or H783) may be counted toward the Microbiology Major. These courses may be scheduled by contacting any faculty member in the department. You may also discuss your research options with the Coordinator of Undergraduate Research. Other major elective courses graded S/U are Microbiology 591 and 799. Remember, you can count ONLY 5 elective hours total from the courses graded S/U.

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

Microbiology 509 may be taken as an introduction to microbiology. However, credit gained for Microbiology 509 does NOT count toward the 40 credit hours required for the Microbiology Major.

Microbiology Major Courses—21 Hours of REQUIRED COURSES

Department #	Credit Hours	Course Title (Quarter taught)	Prerequisites	Instructor
Biochemistry 511	5	Introduction to Biological Chemistry (Su, Au, Wi, Sp)	Biology 114 or H116, Chemistry 252	Contact BioChem Dept. at 292-6771
Microbiology 520	5	General Microbiology I (Au, Sp);	Biology 114 or H116	K. Fredrick (Au), B. Alber (Sp)
Microbiology 581.01*	3	Microbial Genetics Lecture (Au, Sp)	Microbiology 520 (C- or better) or Molecular Genetics 500	B. Ahmer
Microbiology 581.02*	3	Microbial Genetics Lab (Au, Wi, Sp)	Microbiology 581.01 (C- or better)	K. Sandman
Microbiology 521	5	General Microbiology II (Wi, Su)	Microbiology 520 (C- or better) and Chemistry 252	M. Ibba (Wi), C. Daniels (Su)

*Microbiology 581 will be split into 2 courses beginning Sp 2010

**Microbiology Major Courses—ELECTIVE COURSES, GROUP 1:
Take 10-19 hr. from this group**

Micro. Course No.	Credit Hours	Course Title (Quarter taught)	Prerequisites	Instructor
522.01	3	Immunobiology Lecture (Wi, Su)	C- or better in either Microbiology 520 or 509	A. Satoskar, J. Kwiek, & M. Pradhan
522.02	3	Immunobiology Laboratory (Wi)	Microbiology 522.01 (or concurrent with)	M. Pradhan
524.01	4	Microbial Diseases (Sp)	Microbiology 522.01	S. Seveau
591	2 <i>Graded S/U</i>	DNA Fingerprinting; Service learning course (Sp)	Students present workshops at Columbus Public High Schools;	A. Simcox
H610	5	Bioinformatics and Molecular Microbiology (<i>offered infrequently in Au</i>)	Microbiology 581 or Molecular Genetics 605, and Biochemistry 511; or permission of instructor	C. Daniels
629	5	Parasitology (Sp)	Microbiology 522.01 or permission of instructor	J. Alfonzo
636.01	3	Food Microbiology Lecture (Au, Sp)	C- or better in either Microbiology 509 or 520	A. Yousef
636.02	3	Food Microbiology Laboratory (Au, Sp)	Microbiology 636.01 (or concurrent with)	A. Yousef
647	3	Eukaryotic Pathogens (Au)	Microbiology 520 (C- or better) or 524; or Molecular Genetics 500 or 605; or Biochemistry 511	C. Rappleye
649	5	Introductory Virology (Wi)	Microbiology 520 (C- or better)	M. Williams
661	5	General Microbial Physiology (Au)	Microbiology 521 (C- or better) and Biochemistry 511	J. Krzycki
664	3	Microbial Ecology (Au/2010)	C- or better in Microbiology 509 or equivalent	O. Tuovinen
665	3	Environmental Microbiology (Au/2011)	C- or better in Microbiology 509 or equivalent	O. Tuovinen
H669	5	Microbial Evolution (Au)	10 credit hours of biological sciences course work	S. Abedon
680	3	Advanced Microbial Genetics (Wi)	Microbiology 581 (C- or better), or Molecular Genetics 500 or 605, or equivalent	I. Artsimovitch

Elective Courses, GROUP 1 (Cont.)

Micro. Course No.	Credit Hours	Course Title (Quarter taught)	Prerequisites	Instructor
694	3	Microbial Physiology Meets Pathogenesis (Wi 2010)	Advanced undergrads , permission of instructor	T. Henkin & D. Wozniak
693	1-5 Graded S/U	Individual Study (Su, Au, Wi, Sp)	Permission of instructor. Maximum of 5 credit hours for 693 or 699 or any combination of the two courses can be counted toward the Major.	<i>Contact individual faculty member or Dr. Fredrick</i>
699		Undergraduate Research (Su, Au, Wi, Sp)		
The 700-level courses below are GRADUATE courses and should be taken ONLY by advanced (senior year) undergraduates. (Exceptions: Micro H783 and 799)				
701	5	Cellular and Molecular Immunology (Au)	Biochemistry 613, Molecular Genetics 500 or 605	A. Satoskar, et al
724	5	Molecular Biology of Bacterial Pathogens (Au)	Permission of instructor	R. Munson, et al
736	3	Advanced Food Microbiology (Wi 2011)	Microbiology 636.01 and Chemistry 123	H. Wang
760	3	Advanced Bacterial Physiology (Sp 2010)	Microbiology 661 or permission of instructor	J. Krzycki, et al
H783	3-5 Graded S/U	Undergraduate Honors Research (Su, Au, Wi, Sp)	For microbiology major honors with distinction students. Maximum of 5 credit hrs. can count for the Major.	<i>Contact Honors Advisor (Dr. Alfonzo)</i>
799	1 Graded S/U	Microbiology Colloquium (Au, Wi, Sp)	Repeatable for maximum of 2 credit hours.	B. Ahmer

**Microbiology Major Courses—ELECTIVE COURSES, GROUP 2:
Take 0-9 hr. from this group**

Department #	Credit Hours	Course Description (Quarters taught)	Prerequisites
Microbiology 301N	2	The Biology of Pollution (Au)	5 credit hours of biology
Biochemistry 521	5	Introduction to Biological Chemistry Laboratory (Wi, Sp)	Biochemistry 511 or 613 or equivalent
Molecular Genetics 500	5	General Genetics (Su, Au, Wi, Sp)	Biology 113 or H115, 5 additional hours in biological sciences
Molecular Genetics 605	4	Molecular Genetics I (Wi)	Biochemistry 511 and Mathematics 152
Molecular Genetics 606	4	Molecular Genetics II (Sp)	Molecular Genetics 605
MVIMG 600	2	Evolution of Emerging Viruses (Sp)	2 years of course work in the biological sciences suggested
Plant Pathology 600 •600.01 •600.02	6 (3 hr. each)	Intro. To Bacterial and Viral Pathogens of Plants (Au) •Phylobacteriology (1 st five weeks) •Plant Virology (2 nd five weeks)	Plant Pathology 401 or Microbiology 521, or permission of instructor
Plant Pathology 602	3	Plant-Microbe Interactions (Sp)	Plant Pathology 401, Biochemistry 511, or Microbiology 509 or permission of instructor
Plant Pathology 660	5	Mycology (Wi)	Biology 114 or Plant Pathology 300 or 401
Animal Science 690	5	Anaerobic Microbiology (Sp)	Microbiology 520 and Biochemistry 511
Envir. & Natural Resources 665	4	Biology of Soil Ecosystems (Sp)	ENR 300 or 301, or permission of instructor with Micro 520

Faculty Contact Information for Group 1 Courses

Name	Office/ Phone #	Email
Dr. Brian Ahmer	BioSci/ 292-1919	Ahmer.1@osu.edu
Dr. Birgit Alber	BioSci 417/ 247-4443	Alber.8@osu.edu
Dr. Juan Alfonzo	BioSci 440A/ 292-0004	Alfonzo.1@osu.edu
Dr. Irina Artsimovitch	Aronoff 216/ 292-6777	Artsimovitch@osu.edu
Dr. Charles Daniels	BioSci 428A/ 292-4599	Daniels.7@osu.edu
Dr. Kurt Fredrick	Aronoff 286/ 292-6679	Fredrick.5@osu.edu
Dr. John Gunn	Tzagournis 270/ 292-6036	Gunn.43@osu.edu
Dr. Tina Henkin	Riffe 904/ 688-3831	Henkin.3@osu.edu
Dr. Michael Ibba	Aronoff 276/ 292-2120	Ibba.1@osu.edu
Dr. Pravin Kaumaya	316 MedRes Ctr/ 292-7028	Kaumaya.1@osu.edu
Dr. Joseph Krzycki	Riffe 914/ 292-1578	Krzycki.1@osu.edu
Dr. Jesse Kwiek	BRT 1008/ 292-3256	Kwiek.2@osu.edu
Dr. Robert Munson	Children's Hospital/ 722-2778	Munson.10@osu.edu
Dr. Madhura Pradhan	Riffe 140/ 292-1196	Pradhan.2@osu.edu
Dr. Chad Rappleye	BioSci 540A/ 247-2718	Rappleye.1@osu.edu
Dr. John Reeve	BioSci 376/ 292-2301	Reeve.2@osu.edu
Dr. Kaethe Sandman	BioSci 476/ 292-5867	Sandman.1@osu.edu
Dr. Abhay Satoskar	Aronoff 218/ 292-3243	Satoskar.2@osu.edu
Dr. Larry Schlesinger	Doan N1149/ 293-5671	Schlesinger.17@osu.edu
Dr. Stephanie Seveau	BioSci 541A/ 247-7671	Seveau.1@osu.edu
Dr. Amanda Simcox*	BioSci 963/ 292-8857	Simcox.1@osu.edu
Dr. Robert Tabita	Riffe 700/ 292-4297	Tabita.1@osu.edu
Dr. Olli Tuovinen	BioSci 452A/ 292-3379	Tuovinen.1@osu.edu
Dr. Hua Wang	Parker 110/ 292-6281	Wang.707@osu.edu
Dr. Marshall Williams	Graves 2074/ 292-0710	Williams.70@osu.edu
Dr. Dan Wozniak	BRT 1018/ 247-7629	Wozniak.1@osu.edu
Dr. Ahmed Yousef	Parker 217/ 292-7814	Yousef.1@osu.edu

*Department of Molecular Genetics faculty member



Major Program Form

College of the Arts and Sciences

Name

Major **MICROBIOLOGY**

Last, First, Middle

Name #: _____

Degree Sought: BA BS

Local Address

(Zip)

Phone: resident

Expected Date of Graduation

(Quarter and Year)

business

Email Address

Have you filed a degree application in the College of Arts and Sciences: Yes No

(Note: This form is **NOT** A degree application.)

If completing two majors, list both below and file a separate form for each one:

1) _____ 2) _____

Part A. Require Prerequisites (and/or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Math 152	15		Chemistry 252	6-8	
Physics 113	15		Chemistry		
Biology 114	10				

Part B. Major Program (Minimum grade of "C-" required. Minimum grade of "C" (2.00) Core Requirements (Substitutions are rarely if ever permitted)

Courses	Hours	Grade
Micro 520	5	
Micro 521	5	
BioChem 511	5	
Micro 581.01	3	
Micro 581.02	3	

Additional Major Program Courses

GROUP 1 (10-19 hr. w/581.01/.02)			GROUP 2 (0-9 hr.)		
Courses	Hours	Grade	Courses	Hours	Grade

Total of Part B only:

Check whether this is: original revision

Distribution: One copy each – Faculty adviser

Student

College Office
130 Denney Hall

Signature of faculty adviser

Linda Saville-Rath

Name of Faculty Adviser (Please Print)

Microbiology

Department

2-0509

Campus Phone

Date