

Fall 2020 Course Descriptions as of 03/30/2020 08:12 PM

Information in Browse Course Catalog is subject to change. Information is term specific. Please refer to the appropriate term when searching for course content. Key to Course Descriptions may be found at: http://rcs.registrar.arizona.edu/course_descriptions_key.

Microbiology (MIC)

MIC 195A: Great Experiments in Microbiology (1 unit)

Description: This course will present classical experiments and discoveries that served as the foundation of modern microbiology and immunology. Significant milestones, major figures, and their original writings will be discussed, as well as the application of the scientific method and the role of accidental discoveries in the progress of science.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Colloquium Required

Equivalent to: BIOC 195A, MCB 195A, MICR 195A

Also offered as: BIOC 195A

Course typically offered:

Main Campus: Spring

Freshman Colloquia: Freshman Colloquia

MIC 195D: Colloquium: This Wormy World (1 unit)

Description: This Wormy World is a course designed to introduce students to various types of parasites and other infectious agents that affect humans and animals around the world.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Colloquium Required

Equivalent to: MIC 195D

Also offered as: ACBS 195D

Course typically offered:

Main Campus: Fall

Home department: School of Animal & Comparative Biomedical Sciences

Freshman Colloquia: Freshman Colloquia

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 195F: Plagues, Peoples, and Society (1 unit)

Description: This colloquium addresses the role of infectious disease epidemics on people and societies throughout history. The topics covered are origins, geography, effects on peoples and societies, as well as perceptions, beliefs, and attempts to control disease. Historical epidemics and responses to them are compared to the current and likely future crises of infectious disease in society

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Colloquium Required

Course typically offered:

Main Campus: Spring

Freshman Colloquia: Freshman Colloquia

MIC 195G: Careers in Microbiology (1 unit)

Description: This colloquium is designed to introduce students to various careers and industries related to the field of microbiology, such as laboratory diagnostics, micro brewing, academia, government or military research, and public health. Students will meet a variety of guest speakers whose professions are directly related to the field of microbiology. The goals of this course are to help students better define their career paths and encourage curricular choices that align with their career aspirations. Students will also learn the differences between and how to prepare a resume and curriculum vitae.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Colloquium Required

Course typically offered:

Main Campus: Fall

Freshman Colloquia: Freshman Colloquia

MIC 199: Independent Study (1 - 3 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.

Grading basis: Alternative Grading: S, P, F

Career: Undergraduate

Course Components: Independent Study Required

Course typically offered:

Main Campus: Fall, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 199H: Honors Independent Study (1 - 6 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.

Honors Course: Honors Course

Honors Course: Honors Course

MIC 204: Microbes and Society (3 units)

Description: This course explores the roles and responses of individuals and societies to the challenges of microbes. Topics include the microbial biosphere, microbial growth and colonization, microbes in the environment, ecological relationships with humans, parasitism, disease, and disease prevention, food and water management and safety, responses to ancient plagues and modern epidemics, and agents of bioterrorism. The course is intended as a general education course for students interested in a stand-alone lecture and discussion on the significance and consequences of microbes and microbial parasitism to individuals, society, and the environment.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Course typically offered:

Main Campus: Spring

Recommendations and additional information: Two courses from Tier One, Natural Sciences (Catalog numbers 170A, 170B, 170C).

General Education: Tier 2 Natural Sciences

MIC 205A: General Microbiology (3 units)

Description: Introduction to the diverse lifestyles of bacteria, viruses, fungi, and protozoan parasites, their importance in the biosphere, and their roles in human and animal diseases.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Course typically offered:

Main Campus: Fall, Spring, Summer

Recommendations and additional information: MCB 181R or PSIO 201; CHEM 101B or CHEM 103A.

Shared Unique Number: SUN# BIO 2205

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 205L: Biology of Microorganisms Laboratory (1 unit)

Description: Laboratory techniques in introductory microbiology.

Grading basis: Regular Grades

Career: Undergraduate

Flat Fee: \$25

Course Components:	Laboratory	Required
	Lecture	May Be Offered

Course typically offered:

Main Campus: Fall, Spring, Summer

Recommendations and additional information: Prerequisite or concurrent registration, MIC 205A.

Shared Unique Number: SUN# BIO 2205

MIC 285L: Principles of Microbiology Laboratory (1 unit)

Description: The course is the laboratory course to accompany MIC 285R.

Grading basis: Regular Grades

Career: Undergraduate

Flat Fee: \$40

Course Components:	Laboratory	Required
---------------------------	------------	----------

Equivalent to: MCB 285L, PLP 285L, SWES 285L, VSC 285L

Also offered as: ACBS 285L, ENVS 285L, MCB 285L, PLP 285L

Course typically offered:

Main Campus: Spring

Recommendations and additional information: MCB 181R, MCB 181L, ECOL 182R, ECOL 182L, CHEM 103A, CHEM 103B, CHEM 104A, CHEM 104B. Concurrent registration, MIC 285R for MIC and V SC majors. Strongly recommended: MIC 285L, MIC 285R be taken together by all others.

MIC 285R: Principles of Microbiology (4 units)

Description: The course is an introductory microbiology class for majors, emphasizing cellular, biochemical and molecular aspects of metabolism, genetics, cell structure, and host-parasite interactions

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Lecture	Required
---------------------------	---------	----------

Equivalent to: MCB 285R, PLP 285R, SWES 285R, VSC 285R

Also offered as: ACBS 285R, ENVS 285R, MCB 285R, PLP 285R

Course typically offered:

Main Campus: Spring

Recommendations and additional information: MCB 181R, MCB 181L, ECOL 182R, ECOL 182L, CHEM 103A, CHEM 103B, CHEM 104A, CHEM 104B. Concurrent registration, MIC 285R for MIC and V SC majors. Strongly recommended MIC 285L, MIC 285R be taken together by all others.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 299: Independent Study (1 - 3 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.

Grading basis: Alternative Grading: S, P, F

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

MIC 299H: Honors Independent Study (1 - 3 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Independent Study Required

Course typically offered:

Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.

Honors Course: Honors Course

Honors Course: Honors Course

MIC 305: Introductory Plant Pathology (3 units)

Description: Detailed study of representative plant diseases, with emphasis on basic concepts of diagnosis, cause, epidemiology, and control.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: MIC 305

Also offered as: PLP 305

Course typically offered:

Main Campus: Fall

Distance Campus: Spring (odd years only)

Recommendations and additional information: MCB 181R.

Home department: Plant Pathology

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 310: Living in Symbiosis (3 units)

Description: This course will provide an overview of the diversity of associations that exist between microbes and eukaryotic hosts. The course will span from highly integrated obligatory symbioses to loose associations. Emphasis will be placed on symbiotic associations with relevance to human medicine, veterinary sciences, and agriculture.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: ECOL 310, MIC 310, VSC 310

Also offered as: ACBS 310, ECOL 310, ENTO 310

Course typically offered:

Main Campus: Fall

Home department: Entomology

MIC 320: Microbiomes (3 units)

Description: The world is full of communities of interacting microbes. For example, environmental communities can be manipulated to aid in the cleanup of human pollution (such as oil spills) and communities present in hosts can prevent sickness and aid in important processes like digestion. Furthermore, humans have cultivated and domesticated a variety of microbial communities to produce foods like yogurt, to ferment beer, and to synthesize pharmaceuticals such as insulin. One major goal for research in this area is to learn how to control, influence, and engineer microbiomes to ensure outcomes beneficial for humanity. At the heart of such studies is knowledge concerning ecological principles that determine community structure, but also information about mechanisms that organisms (including humans) use to kill or foster the growth of specific microbes. To address these questions, it will be key to delve into the genetic basis for microbe-microbe interactions and learn the process of designing new microbes. This course will provide a knowledge base to enable critical thinking about the past, present, and future of microbiome research and will foster an understanding of how easy (or difficult) it is to manipulate and control these communities.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Lecture	Required
--------------------	---------	----------

Also offered as: PLP 320

Course typically offered:

Main Campus: Fall

Recommendations and additional information: Background classes in genetics and molecular biology (MCB181/182, PLS312, ECOL320, ECOL326) or microbiology (MIC428, ENV5425, ACBS438, MIC452, PLP329, MIC420) are encouraged but not required.

Home department: School of Plant Science

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 328L: Microbial Physiology Lab (1 unit)

Description: The objective of this course is to provide further development of laboratory techniques, to develop writing and scientific reasoning skills, and to supplement the material covered in the MIC 328R.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Laboratory Required

Course typically offered:

Main Campus: Spring

Recommendations and additional information: MIC 205L or MIC 285L.

MIC 328R: Microbial Physiology (3 units)

Description: This course will cover the biochemical mechanisms of microbial cell physiology. Areas to be covered include but are not limited to catabolic and anabolic processes, genetics, physiological networks, microbial cell structures, and the synthesis of macromolecular complexes such as ribosomes, flagella and viruses

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Course typically offered:

Main Campus: Spring

Recommendations and additional information: CHEM 241A; MIC 205A OR MIC 285R

MIC 329A: Microbial Diversity (3 units)

Description: Microbial diversity is a course offered to students in Microbiology, and to other majors with an interest in the remarkable genetic, species-level, phylogenetic, functional, and ecological diversity of prokaryotic and eukaryotic microorganisms.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: ECOL 329A, MIC 329, MIC 329A, PLP 329, VSC 329, VSC 329A

Also offered as: ACBS 329A, ECOL 329A, PLP 329A

Course typically offered:

Main Campus: Fall

Distance Campus: Fall

Recommendations and additional information: MCB 181R.

Home department: Plant Pathology

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 340: Introduction to Biotechnology (3 units)

Description: Survey of both the basic concepts and techniques used in the analysis and improvement of biological organisms by genetic engineering and cell culture as well as examples of biotechnology improvements that have been made in various organisms. The course covers topics ranging from bioremediation to Cancer Stem Cells.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: MCB 340, MIC 340

Also offered as: MCB 340, PLS 340

Course typically offered:

Main Campus: Fall

Recommendations and additional information: PLS 240 or MCB 181R or MIC 205 or an introductory course in biology.

Home department: School of Plant Science

MIC 350: Core Concepts in Molecular Microbiology (3 units)

Description: This is an advanced, evidence-based course focused on modern molecular microbiology. The overarching goal is to provide Microbiology Majors as well as pre-health-profession students with a conceptual appreciation of molecular and biochemical aspects of microbial lifestyle and function. Structures, processes, communities, evolution, information-flow and omics-based methodologies will be explored using specific microbial examples, recent and evolving scientific literature, as well as case-based studies where appropriate. Importantly, this course will facilitate SACBS Microbiology Majors taking other required or elective 400/500- level courses.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Course typically offered:

Main Campus: Fall

Recommendations and additional information: MIC 205A or MIC 285R.

MIC 393: Internship (1 - 3 units)

Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.

Grading basis: Alternative Grading: S, P, F

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 399: Independent Study (1 - 4 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.

Grading basis: Alternative Grading: S, P, F

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

MIC 399H: Honors Independent Study (1 - 3 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.

Honors Course: Honors Course

Honors Course: Honors Course

MIC 403L: Parasitology Laboratory (1 unit)

Description: Parasite morphology and diagnostic laboratory techniques.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Laboratory Required

Equivalent to: ECOL 403L, ENTO 403L, MIC 403L, MICR 403L

Also offered as: ACBS 403L, ECOL 403L, ENTO 403L

Co-convened with: MIC 503L

Course typically offered:

Main Campus: Fall

Recommendations and additional information: Twelve units of biology and microbiology.

Home department: School of Animal & Comparative Biomedical Sciences

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 403R: Biology of Animal Parasites (3 units)

Description: Biology of host-parasite relationships with emphasis on parasites of veterinary and human importance. Parasite morphology and physiology, life cycles, epidemiology, pathogenesis and zoonotic potential.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: ECOL 403R, ENTO 403R, MIC 403R, MICR 403R

Also offered as: ACBS 403R, ECOL 403R, ENTO 403R

Co-convened with: MIC 503R

Course typically offered:

Main Campus: Fall

Recommendations and additional information: Twelve units of biology and microbiology.

Home department: School of Animal & Comparative Biomedical Sciences

MIC 419: Immunology (4 units)

Description: Basic concepts of immunity. Molecular and cellular composition of the immune system and immune processes that are responsible for defense against pathogens and tumors, and for allergic and autoimmune reactions. Honors section convened with V SC 519.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Discussion Lecture	May Be Offered Required
---------------------------	-----------------------	----------------------------

Equivalent to: MICR 419, VSC 419

Also offered as: ACBS 419

Co-convened with:

Course typically offered:

Main Campus: Fall

Recommendations and additional information: MIC 285R, CHEM 241B.

Writing Emphasis: Writing Emphasis Course

MIC 420: Pathogenic Bacteriology (3 units)

Description: This course explores major themes in mechanisms of bacterial pathogenesis using examples from a variety of important human and veterinary pathogens. Students will learn to find and interpret primary literature related to pathogenic bacteria.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Lecture	Required
---------------------------	---------	----------

Co-convened with: MIC 520

Course typically offered:

Main Campus: Fall

Recommendations and additional information: MIC 205 or MIC 285.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 421B: Microbiological Techniques (5 units)

Description: This laboratory course emphasizes the methods used to identify human and animal pathogens, their toxins and antigens. It encompasses methods used in bacteriology, virology, mycology and immunology. It will be assumed that you know basic bacteriological methods, including staining, streaking for isolation, and aseptic technique.

Grading basis: Regular Grades

Career: Undergraduate

Flat Fee: \$135

Course Components:	Laboratory	Required
	Lecture	Required

Course typically offered:

Main Campus: Fall

Recommendations and additional information: MIC 205A, MIC 205L. MIC 421A is not prerequisite to MIC 421B.

MIC 423: Mechanisms of Disease (3 units)

Description: This course focuses on the fundamental pathogenetic mechanisms and lesions which are common to all mammalian species and which are manifested as disease. The course is centered upon General Pathology and focuses on how different types of disease develop and their consequences. The material is presented using a comparative (i.e. animal and human) approach that emphasizes the commonalities between disease processes rather than the exceptions. Successful integration of course concepts will provide the necessary foundation on which competency in clinical, diagnostic, or experimental medicine and biomedical research can be built. Further, the course will provide the general mechanistic knowledge required for the subsequent study and understanding of specific disease entities, categorized by organ system, in Systemic Pathology. The course stresses general mechanisms of disease common to all mammalian species and is divided into 5 major sections: tissue injury and adaptation; inflammation and repair; disorders of circulation; disorders of immunity; and disorders of cell growth with emphasis on neoplasia. Available for honors credit.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Lecture	Required
---------------------------	---------	----------

Also offered as: ACBS 423, PCOL 423

Course typically offered:

Main Campus: Spring

Recommendations and additional information: Six units of upper division ACBS and/or MIC credit, or consent of instructor.

Home department: School of Animal & Comparative Biomedical Sciences

Enrollment requirement: Prerequisites: ACBS 400A (or 500A) and ACBS 400B (or 500B) or concurrent enrollment, or PSIO 201 and PSIO 202 or concurrent enrollment, or ACBS 215 or concurrent enrollment, or consent of instructor.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 424: Virology Laboratory (3 units)

Description: This course is to introduce students to virology research and skills used for the study of viruses. The experiments in the course have not been conducted before and represent novel lines of investigation. Although preliminary hypotheses will be discussed, experimental results cannot be predicted. They will either prove or disprove a hypothesis.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Laboratory	Required
	Lecture	May Be Offered

Course typically offered:

Main Campus: Summer

Recommendations and additional information: MIC 205A, MIC 205L, MIC 419.

Honors Course: Honors Contract

Honors Course: Honors Contract

MIC 425: Environmental Microbiology (3 units)

Description: Current concepts in microbiology across environments, including soil, aquatic and air. Emphasis on the role of microbes in remediation and biogeochemistry.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Lecture	Required
---------------------------	---------	----------

Equivalent to: MIC 425, MICR 425, SW 425

Also offered as: ENVS 425

Course typically offered:

Main Campus: Fall

Recommendations and additional information: MIC 205A.

Home department: Soil, Water, & Environmental Sciences

Enrollment requirement: Completion of MIC 205A required for enrollment.

MIC 426: Environmental Microbiology Laboratory (2 units)

Description: Basic techniques for isolation and characterization of environmental soil and water microflora including methods for enumeration and measurement of physiological activity.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Laboratory	Required
---------------------------	------------	----------

Equivalent to: MIC 426, MICR 426, SW 426

Also offered as: ENVS 426

Course typically offered:

Main Campus: Fall

Home department: Soil, Water, & Environmental Sciences

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 427L: General Mycology Laboratory (2 units)

Description: General mycology laboratory, with emphasis on the microfungi.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Laboratory Required

Equivalent to: MIC 427L

Also offered as: PLP 427L

Course typically offered:

Main Campus: Fall

Distance Campus: Fall

Recommendations and additional information: PLP 427R.

Home department: Plant Pathology

MIC 427R: General Mycology (3 units)

Description: An exploration of the diversity of fungi and fungus like organisms covering general biology and roles as pathogens (of humans and plants), saprobes and symbionts. Fungi as models for eukaryotic molecular research and their uses in industry will be covered.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Repeatable: Course can be repeated a maximum of 2 times.

Equivalent to: MIC 427R, VSC 427R

Also offered as: ACBS 427R, PLP 427R

Co-convened with: PLP 527R

Course typically offered:

Main Campus: Fall

Distance Campus: Fall

Recommendations and additional information: MCB 181R, MIC 285R.

Home department: Plant Pathology

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 428L: Microbial Genetics Laboratory (2 units)

Description: Laboratory associated with lecture course on Prokaryotic gene structure and function; methods of gene transfer and mapping, DNA structure, replication, transcription, and translation. Hands-on computer analysis of DNA sequences and gene cloning strategies. Principles of regulation of gene expression. Biology of plasmids and bacteriophages.

Grading basis: Regular Grades

Career: Undergraduate

Flat Fee: \$70

Course Components: Laboratory Required

Equivalent to: ECOL 428L, MCB 428L, MIC 428L, MICR 428L, PLS 428L, SWES 428L, VSC 428L

Also offered as: ACBS 428L, ECOL 428L, ENVS 428L, PLP 428L, PLS 428L

Co-convened with: MIC 528L

Course typically offered:

Main Campus: Spring

Recommendations and additional information: ECOL 320, PLS 312 and PLP 428R.

Home department: Plant Pathology

Writing Emphasis: Writing Emphasis Course

MIC 428R: Microbial Genetics (3 units)

Description: Prokaryotic gene structure and function; methods of gene transfer and mapping, DNA structure, replication, transcription, and translation. Hands-on computer analysis of DNA sequences and gene cloning strategies. Principles of regulation of gene expression. Biology of plasmids and bacteriophages.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: ECOL 428, ECOL 428R, GENE 428R, MCB 428, MIC 428, MIC 428R, MICR 428, MICR 428R, PLP 428, PLS 428R, SW 428, SWES 428, SWES 428R, VSC 428, VSC 428R

Also offered as: ACBS 428R, ECOL 428R, ENVS 428R, PLP 428R, PLS 428R

Co-convened with: MIC 528R

Course typically offered:

Main Campus: Spring

Distance Campus: Spring

Home department: Plant Pathology

Writing Emphasis: Writing Emphasis Course

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 430: Food Microbiology and Biotechnology (3 units)

Description: Food microbiology and biotechnology course will provide an introduction to the microorganisms of importance in foods, both beneficial and harmful, and application of biotechnology in foods. The focus of this course will be on microorganisms and other agents causing foodborne illnesses, the use of microorganisms in food production, role of regulatory agencies in foodborne outbreak investigations, and detection and prevention of food spoilage and pathogenic organisms using various methods including those from chemistry, biochemistry and molecular biology. The practical difficulties of how the knowledge gained from research studies can be applied to a variety of fields in food microbiology and technology will be explored. The course will consist of a mixture of lectures by the instructor/guest lecturers, and presentation and subsequent group discussions of assigned readings.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Co-convened with: MIC 530

Course typically offered:

Main Campus: Spring

Recommendations and additional information: ANS 380.

MIC 430L: Advanced Food Science & Microbiology Laboratory (2 units)

Description: This course is designed to provide students with the opportunity to pursue advanced techniques related to food science and food microbiology. These laboratory techniques will enable students to objectively evaluate food qualities, microbial activity and sensory attributes. The class will begin with classroom instruction and lab exercises covering the principles of advanced food microbiology and food chemistry as well as lab principles, procedures, and practices. It will provide an understanding of food processing whether it be thermal, dehydration, low water activity (aw), or acidification and the controls of the process that make the product safe such as temperature, pH, moisture content, aw, or a combination. The interactions between microorganisms and process variables will be used to confirm the commercial safety of the food. Additionally, the students will gain an understanding of the importance of shelf-life on marketability and also how packaging and ingredient options play a role in improving texture and flavor as well as microbial stability during storage. After basic lab exercises to reinforce initial lecture content are covered, in groups of two or three, students will develop a project to pursue for their lab work for the rest of the course. They will develop a product, analyze it for quality attributes and microbial activity during storage, and determine its shelf-life. The product should also have market appeal.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Laboratory Required

Also offered as: NSC 430L

Co-convened with: MIC 530L

Course typically offered:

Main Campus: Fall

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 432: Comparative Immunology (3 units)

Description: How have vertebrate immune systems evolved from simple origins? We will cover comparative immunology of prokaryotes, protozoans, plants, fungi, invertebrates, and "lower" vertebrates. By studying the origins and evolution of immunity across the history of life, and following the progression of immune system complexity across different lineages, we begin to see patterns that help explain how our immune system developed from those of our ancestors. Such comparative study will highlight the strengths and weaknesses of our immune system, and point to ways in which other organisms have overcome the same pathogenic stresses we currently face. This class will pull together data from many fields, including immunology, molecular and cell biology, ecology, and evolution.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Also offered as: ACBS 432, ECOL 432, ENTO 432, MCB 432

Co-convened with: MIC 532

Course typically offered:

Main Campus: Fall

Home department: Entomology

Enrollment requirement: MCB 181R and MCB 181L, ECOL 182R and ECOL 182L, or instructor consent.

MIC 433: Medical and Molecular Virology (4 units)

Description: Structure, classification, replication, and mechanisms of pathogenesis of human and animal viruses.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: MCB 433, MIC 433

Also offered as: MCB 433

Co-convened with: VSC 533

Course typically offered:

Main Campus: Spring

Recommendations and additional information: MIC 181R, MIC 181L, MIC 205A or consent of instructor.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 438: Ecology of Infectious Disease (3 units)

Description: Ecology of the major infectious diseases of humans and animals.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: MIC 438, MICR 438

Also offered as: ACBS 438

Co-convened with: MIC 538

Course typically offered:

Main Campus: Spring

Home department: School of Animal & Comparative Biomedical Sciences

MIC 440: Biodegradation of Pollutants in Soil and Groundwater (3 units)

Description: Description of modern pollution problems and potential biological remediation techniques focusing on the chemistry, biochemistry and molecular biology of biodegradation of hazardous and toxic compounds.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: MIC 440, SW 440

Also offered as: ENVS 440

Course typically offered:

Main Campus: Spring

Recommendations and additional information: SWES 425.

Home department: Soil, Water, & Environmental Sciences

MIC 443: Research Animal Methods (3 units)

Description: Regulations, care, diseases and techniques involving common laboratory animals used in research and teaching programs.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Equivalent to: ANS 443, BIOC 443, MIC 443, MICR 443

Also offered as: ACBS 443, BIOC 443

Course typically offered:

Main Campus: Fall

Home department: School of Animal & Comparative Biomedical Sciences

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 446: Insect Pathogens: Biocontrol Agents & Biological Models (4 units)

Description: Ecology and biology of insect pathogens (viruses, bacteria, protozoa, nematodes). Diagnostics, safety testing of pathogens. Genomics and genetic engineering of entomopathogens. Insect pathogens as biological model organisms. Applications in medical and veterinary research and pharmaceutical bioprospecting.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Discussion	May Be Offered
	Laboratory	May Be Offered
	Lecture	Required

Repeatable: Course can be repeated a maximum of 2 times.

Equivalent to: INSC 446, MCB 446, MIC 446, PLP 446, VSC 446

Also offered as: ENTO 446, MCB 446, PLP 446

Course typically offered:

Main Campus: Spring

Recommendations and additional information: ENTO 411, ENTO 415L, ENTO 415R or consent of instructor.

Field trip: Field trip.

Home department: Entomology

MIC 450: Veterinary Microbiology (3 units)

Description: This course is designed to introduce students to the major groups of microorganisms (bacterial, viral, and fungal) that have a role in producing infectious diseases in animals. Additionally, the course will familiarize students with the principles of host-pathogen relationships, the biology, ecology, pathogenesis, and laboratory identification of representative critical/major bacterial, viral, and fungal pathogens of animals. Students will learn the interactions various animal hosts have to different microbial pathogens, and how this can alter the type of disease produced in different types of animals. The course will also discuss the overall impact these diseases have on wildlife and domestic pets, and the major agricultural impact/cost certain pathogens can have on livestock and our food supply.

Grading basis: Regular Grades

Career: Undergraduate

Course Components:	Lecture	Required
---------------------------	---------	----------

Co-convened with: MIC 550

Course typically offered:

Main Campus: Fall

Enrollment requirement: MIC 205A

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

Description: Antibiotics - a biological perspective provides an introduction to the major classes of antibiotics, their modes of action, the threat and reality of antibiotic resistant "superbugs", as well as the biosynthesis, microbiological role, discovery, and industrial production of these compounds. The course will concentrate on the microbiological, genetic, and molecular biological aspects of antibiotics and antibiotic resistance, with less emphasis on chemistry. Thus, it complements but does not replace other courses that may detail the chemical synthesis and medicinal chemistry of these compounds, or concentrate on their medical or veterinary application as drugs. The course is designed to increase the awareness and appreciation of the importance of antibiotics and anti-infective research in an age when: cheap and failsafe antibiotic cures are considered a birthright in developed countries while lacking in the rest of the world; antibiotic use and misuse is prevalent in medicine, veterinary practice, and agriculture; antibiotic agents increasingly lose effectiveness due to emerging resistance; and anti-infective research has been severely curtailed by pharmaceutical companies.

Main Campus: Fall

Main Campus: Spring

Home department: School of Animal & Comparative Biomedical Sciences

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 456: Topics in Biotechnology (3 units)

Description: This course is designed to help you develop a deeper understanding of a variety of current topics in Biotechnology including GMOs, Stem Cells, Designer Babies, Synthetic Biology, Nanobiotechnology, Cancer Biology, Epigenetics, Vaccines, Antibiotics, Immunotherapy, Aging, Cloning and Gene Editing.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Lecture Required

Also offered as: PLS 456

Co-convened with: MIC 556

Recommendations and additional information: PLS 340 preferred not required.

Home department: School of Plant Science

MIC 492: Directed Research (1 - 6 units)

Description: Individual or small group research under the guidance of faculty.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated for a maximum of 24 units.

Course typically offered:

Main Campus: Fall, Spring

Field trip: N/A

MIC 493: Internship (1 - 3 units)

Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.

Grading basis: Alternative Grading: S, P, F

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

MIC 494R: Research (3 units)

Description: The practical application, on an individual basis, of previously studied theory and the collection of data for future theoretical interpretation.

Grading basis: Alternative Grading: S, P, F

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 2 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 498: Senior Capstone (1 - 3 units)

Description: A culminating experience for majors involving a substantive project that demonstrates a synthesis of learning accumulated in the major, including broadly comprehensive knowledge of the discipline and its methodologies. Senior standing required.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Independent Study Required

Course typically offered:

Main Campus: Fall, Spring

MIC 498H: Honors Thesis (3 units)

Description: An honors thesis is required of all the students graduating with honors. Students ordinarily sign up for this course as a two-semester sequence. The first semester the student performs research under the supervision of a faculty member; the second semester the student writes an honors thesis.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated for a maximum of 9 units.

Equivalent to: MICR 498H

Course typically offered:

Main Campus: Fall, Spring

Enrollment requirement: Student must be active in the Honors College.

Honors Course: Honors Course

Honors Course: Honors Course

Writing Emphasis: Writing Emphasis Course

MIC 499: Independent Study (1 - 4 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.

Grading basis: Alternative Grading: S, P, F

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 499H: Honors Independent Study (3 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.

Grading basis: Regular Grades

Career: Undergraduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.

Honors Course: Honors Course

Honors Course: Honors Course

MIC 503L: Parasitology Laboratory (1 unit)

Description: Parasite morphology and diagnostic laboratory techniques.

Grading basis: Regular Grades

Career: Graduate

Course Components: Laboratory Required

Equivalent to: ECOL 503L, EIS 503L, ENTO 503L, IMB 503L, INSC 503L, MBIM 503L, MICR 503L, VSC 503L

Also offered as: ACBS 503L, ECOL 503L, EIS 503L, IMB 503L

Co-convened with:

Course typically offered:

Main Campus: Fall

MIC 503R: Biology of Animal Parasites (3 units)

Description: Biology of host-parasite relationships with emphasis on parasites of veterinary and human importance. Parasite morphology and physiology, life cycles, epidemiology, pathogenesis and zoonotic potential. Graduate-level requirements include an in-depth research paper on the molecular biology/immune response of a single parasite.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: ECOL 503R, EIS 503R, ENTO 503R, IMB 503R, INSC 503R, MBIM 503R, MICR 503R, VSC 503R

Also offered as: ACBS 503R, ECOL 503R, EIS 503R, IMB 503R

Co-convened with: MIC 403R

Course typically offered:

Main Campus: Fall

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 519: General Immunological Concepts (4 units)

Description: Basic concepts of the immune system. Presentation of the roles of antigen, immunoglobulins, complement, lymphokines and role of immune cells play in humoral and cell-mediated immunity.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: IMB 519, MBIM 519, MICR 519, VSC 519

Also offered as: ACBS 519, IMB 519

Co-convened with:

Course typically offered:

Main Campus: Fall

MIC 520: Pathogenic Bacteriology (3 units)

Description: This course explores major themes in mechanisms of bacterial pathogenesis using examples from a variety of important human and veterinary pathogens. Students will learn to find and interpret primary literature related to pathogenic bacteria. Graduate students will make a series of short presentations analyzing papers from the course in more depth.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: IMB 520, MBIM 520, VSC 520

Also offered as: IMB 520

Co-convened with: MIC 420

Course typically offered:

Main Campus: Fall

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 528L: Microbial Genetics Laboratory (2 units)

Description: Laboratory associated with lecture course on Prokaryotic gene structure and function; methods of gene transfer and mapping, DNA structure, replication, transcription, and translation. Hands-on computer analysis of DNA sequences and gene cloning strategies. Graduate-level requirements include the DNA sequence of an entire operon from any one of a variety of bacteria and additionally analyze one product from the operon using several GCG protein analysis programs. Also extra exam questions.

Grading basis: Regular Grades

Career: Graduate

Flat Fee: \$70

Course Components: Laboratory Required

Equivalent to: ECOL 528L, MCB 528L, MIC 528L, MICR 528L, PLS 528L, SWES 528L, VSC 528L

Also offered as: ACBS 528L, ECOL 528L, ENVS 528L, MCB 528L, PLP 528L, PLS 528L

Co-convened with: MIC 428L

Course typically offered:

Main Campus: Spring

Home department: Plant Pathology

MIC 528R: Microbial Genetics (3 units)

Description: Prokaryotic gene structure and function; methods of gene transfer and mapping, DNA structure, replication, transcription, and translation. Hands-on computer analysis of DNA sequences and gene cloning strategies. Principles of regulation of gene expression. Graduate-level requirements include a DNA sequence of an entire operon from any one of a variety of bacteria and additionally analyze one product from the operon using several GCG protein analysis programs plus an extensive exam.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: ECOL 528R, GENE 528, GENE 528R, MCB 528R, MIC 528R, MICR 528R, PLP 528, PLS 528R, SWES 528R, VSC 528R

Also offered as: ACBS 528R, ECOL 528R, ENVS 528R, MCB 528R, PLP 528R, PLS 528R

Co-convened with:

Course typically offered:

Main Campus: Spring

Distance Campus: Spring

Home department: Plant Pathology

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 530: Food Microbiology and Biotechnology (3 units)

Description: Food microbiology and biotechnology course will provide an introduction to the microorganisms of importance in foods, both beneficial and harmful, and application of biotechnology in foods. The focus of this course will be on microorganisms and other agents causing foodborne illnesses, the use of microorganisms in food production, role of regulatory agencies in foodborne outbreak investigations, and detection and prevention of food spoilage and pathogenic organisms using various methods including those from chemistry, biochemistry and molecular biology. The practical difficulties of how the knowledge gained from research studies can be applied to a variety of fields in food microbiology and technology will be explored. The course will consist of a mixture of lectures by the instructor/guest lecturers, and presentation and subsequent group discussions of assigned readings.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Co-convened with: MIC 430

Course typically offered:

Main Campus: Spring

MIC 530L: Advanced Food Science & Microbiology Laboratory (2 units)

Description: This course is designed to provide students with the opportunity to pursue advanced techniques related to food science and food microbiology. These laboratory techniques will enable students to objectively evaluate food qualities, microbial activity and sensory attributes. The class will begin with classroom instruction and lab exercises covering the principles of advanced food microbiology and food chemistry as well as lab principles, procedures, and practices. It will provide an understanding of food processing whether it be thermal, dehydration, low water activity (aw), or acidification and the controls of the process that make the product safe such as temperature, pH, moisture content, aw, or a combination. The interactions between microorganisms and process variables will be used to confirm the commercial safety of the food. Additionally, the students will gain an understanding of the importance of shelf-life on marketability and also how packaging and ingredient options play a role in improving texture and flavor as well as microbial stability during storage. After basic lab exercises to reinforce initial lecture content are covered, in groups of two or three, students will develop a project to pursue for their lab work for the rest of the course. They will develop a product, analyze it for quality attributes and microbial activity during storage, and determine its shelf-life. The product should also have market appeal.

Grading basis: Regular Grades

Career: Graduate

Course Components: Laboratory Required

Also offered as: NSC 530L

Co-convened with:

Course typically offered:

Main Campus: Fall

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 532: Comparative Immunology (3 units)

Description: How have vertebrate immune systems evolved from simple origins? We will cover comparative immunology of prokaryotes, protozoans, plants, fungi, invertebrates, and "lower" vertebrates. By studying the origins and evolution of immunity across the history of life, and following the progression of immune system complexity across different lineages, we begin to see patterns that help explain how our immune system developed from those of our ancestors. Such comparative study will highlight the strengths and weaknesses of our immune system, and point to ways in which other organisms have overcome the same pathogenic stresses we currently face. This class will pull together data from many fields, including immunology, molecular and cell biology, ecology, and evolution. Graduate students will prepare and give one oral presentation of a specific topic to the class, which will be graded.

Grading basis: Regular Grades

Career: Graduate

Course Components:	Lecture	Required
---------------------------	---------	----------

Also offered as: ACBS 532, ECOL 532, EIS 532, IMB 532, MCB 532

Co-convened with: MIC 432

Course typically offered:

Main Campus: Fall

Home department: Committee on Entomology and Insect Science

Enrollment requirement: MCB 181R and MCB 181L, ECOL 182R and ECOL 182L, or instructor consent.

MIC 533: Medical and Molecular Virology (4 units)

Description: Structure, classification, replication, and mechanisms of pathogenesis of human and animal viruses. Graduate-level requirements include an additional discussion hour per week.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: IMB 533, MBIM 533, VSC 533

Also offered as: IMB 533

Co-convened with: MIC 433

Course typically offered:

Main Campus: Spring

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 538: Ecology of Infectious Disease (3 units)

Description: Term paper required for graduate credit.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: IMB 538, MBIM 538, MICR 538, VSC 538

Also offered as: ACBS 538, IMB 538

Co-convened with: VSC 438

Course typically offered:

Main Campus: Spring

MIC 546: Insect Pathogens: Biocontrol Agents & Biological Models (4 units)

Description: Ecology and biology of insect pathogens (viruses, bacteria, protozoa, nematodes).

Diagnostics, safety testing of pathogens. Genomics and genetic engineering of entomopathogens. Insect pathogens as biological model organisms. Applications in medical and veterinary research and pharmaceutical bioprospecting. Graduate-level requirements include students to prepare and give one oral presentation of a specific topic that will be coordinated with the instructor at the beginning of the course. Topics considered in the oral presentations will be included in the final exam.

Grading basis: Regular Grades

Career: Graduate

Flat Fee: \$75

Course Components: Discussion May Be Offered
 Laboratory May Be Offered
 Lecture Required

Repeatable: Course can be repeated a maximum of 2 times.

Equivalent to: ENTO 546, INSC 546, MIC 546, PLP 546, VSC 546

Also offered as: ACBS 546, EIS 546, PLP 546

Course typically offered:

Main Campus: Spring

Recommendations and additional information: EIS 511, EIS 515L, EIS 515R; or consent of instructor.

Home department: Committee on Entomology and Insect Science

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 550: Veterinary Microbiology (3 units)

Description: This course is designed to introduce students to the major groups of microorganisms (bacterial, viral, and fungal) that have a role in producing infectious diseases in animals. Additionally, the course will familiarize students with the principles of host-pathogen relationships, the biology, ecology, pathogenesis, and laboratory identification of representative critical/major bacterial, viral, and fungal pathogens of animals. Students will learn the interactions various animal hosts have to different microbial pathogens, and how this can alter the type of disease produced in different types of animals. The course will also discuss the overall impact these diseases have on wildlife and domestic pets, and the major agricultural impact/cost certain pathogens can have on livestock and our food supply.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Co-convened with: MIC 450

Course typically offered:

Main Campus: Fall

MIC 552: Antibiotics - A Biological Perspective (3 units)

Description: Antibiotics - a biological perspective provides an introduction to the major classes of antibiotics, their modes of action, the threat and reality of antibiotic resistant "superbugs", as well as the biosynthesis, microbiological role, discovery, and industrial production of these compounds. The course will concentrate on the microbiological, genetic, and molecular biological aspects of antibiotics and antibiotic resistance, with less emphasis on chemistry. Thus, it complements but does not replace other courses that may detail the chemical synthesis and medicinal chemistry of these compounds, or concentrate on their medical or veterinary application as drugs. The course is designed to increase the awareness and appreciation of the importance of antibiotics and anti-infective research in an age when: cheap and failsafe antibiotic cures are considered a birthright in developed countries while lacking in the rest of the world; antibiotic use and misuse is prevalent in medicine, veterinary practice, and agriculture; antibiotic agents increasingly lose effectiveness due to emerging resistance; and anti-infective research has been severely curtailed by pharmaceutical companies. Graduate-level requirements include a published peer-reviewed scientific paper pertinent to antibiotic research for reading and for preparing Critical Summaries and a presentation on a selected antibiotic.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: ARL 552, PLP 552

Also offered as: ARL 552, PLP 552

Co-convened with: MIC 452

Course typically offered:

Main Campus: Fall

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 554: Host-Microbial Interactions (3 units)

Description: Graduate-level requirements include a five-page proposal.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: IMB 554, MBIM 554, VSC 554

Also offered as: ACBS 554, IMB 554

Co-convened with: VSC 454

Course typically offered:

Main Campus: Spring

MIC 556: Topics in Biotechnology (3 units)

Description: This course is designed to help you develop a deeper understanding of a variety of current topics in Biotechnology including GMOs, Stem Cells, Designer Babies, Synthetic Biology, Nanobiotechnology, Cancer Biology, Epigenetics, Vaccines, Antibiotics, Immunotherapy, Aging, Cloning and Gene Editing. Graduate-level requirements include leading discussions, organizing undergraduates, a paper on one of our subject areas and organizing tours of appropriate laboratories that do research on one of our subject areas.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Also offered as: PLS 556

Co-convened with: MIC 456

Course typically offered:

Main Campus: Spring

Home department: School of Plant Science

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 573: Recombinant DNA Methods and Applications (4 units)

Description: This course offers an intensive lab experience to teach students the practical and theoretical aspects of modern molecular biology. In the first part of the course, recombinant DNA methods and bioinformatics are used to clone and identify an unknown gene. In the second part of the course DNA microarray technology is used to determine the effect of environmental stress on the global gene expression program in yeast, and to identify genes that control the stress response. Weekly lectures compliment the lab sessions, covering the theory and principles underlying the experiments performed during the course. Graduate level requirements will include additional assignments, such as presenting and discussing research papers applicable to the lab projects or recent advances in molecular biology techniques.

Grading basis: Regular Grades

Career: Graduate

Flat Fee: \$150

Course Components:

Discussion	Required
Lecture	Required

Equivalent to: BIOC 573, GENE 573, MIC 573, MICR 573, PLS 573

Also offered as: BIOC 573, GENE 573, MCB 573, PLS 573

Course typically offered:

Main Campus: Spring

Home department: Molecular & Cellular Biology

Enrollment requirement: (MCB 181R and 181L) or MCB 184.

MIC 593: Internship (1 - 8 units)

Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components:

Independent Study	Required
-------------------	----------

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 595A: Critical Evaluation of Scientific Literature (3 units)

Description: This course is designed specifically for graduate students interested in infectious disease, pathobiology, or microbiology. The objective of this class is to critically evaluate scientific papers and to introduce students to scientific discussion. Each student is required to present a scientific paper to the class. The purpose of the presentation is to describe, and critically review, the salient points of a paper and to lead discussion of the paper's content.

Grading basis: Regular Grades

Career: Graduate

Course Components: Colloquium Required

Repeatable: Course can be repeated for a maximum of 6 units.

Equivalent to: VSC 595A

Course typically offered:

Main Campus: Spring

MIC 599: Independent Study (1 - 3 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Course typically offered:

Main Campus: Fall, Spring, Summer

MIC 611: Comparative Virology (3 units)

Description: A comprehensive course covering broad-ranging aspects of modern virology with an emphasis on comparisons between representative virus groups, taking into account different host, tissue, cell, and vector tropisms, and modes of transmission. The team of instructors will highlight representative types of viruses across different life forms to encourage and illuminate inter-group comparisons in discussion sessions lead by the graduate students.

Grading basis: Regular Grades

Career: Graduate

Course Components: Lecture Required

Equivalent to: MIC 611, PLS 611, VSC 611

Also offered as: ACBS 611, PLP 611, PLS 611

Recommendations and additional information: PLP 305, BIOC 460, VSC 433.

Home department: Plant Pathology

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 696A: Research Seminar (1 unit)

Description: The exchange of scholarly information and various research topics via a presentation and discussion format. The scope of work is presented by current graduate students, departmental and UA professors, and invited researchers. All graduate students in the department must attend. Please note: graduate student registration for the course requires a presentation of a masters report, thesis or dissertation within the semester.

Grading basis: Regular Grades

Career: Graduate

Course Components: Seminar Required

Repeatable: Course can be repeated a maximum of 3 times.

Equivalent to: VSC 696A

Course typically offered:

Main Campus: Fall, Spring

MIC 699: Independent Study (1 - 3 units)

Description: Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Course typically offered:

Main Campus: Fall, Spring, Summer

MIC 900: Research (1 - 9 units)

Description: Individual research, not related to thesis or dissertation preparation, by graduate students.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Spring, Summer

MIC 910: Thesis (1 - 6 units)

Description: Research for the master's thesis.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Winter, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

MIC 920: Dissertation (1 - 9 units)

Description: Research for doctoral dissertation.

Grading basis: Alternative Grading: S, P, F

Career: Graduate

Course Components: Independent Study Required

Repeatable: Course can be repeated a maximum of 99 times.

Course typically offered:

Main Campus: Fall, Winter, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.