

MICROBIOLOGY (MICROBIO)

MICROBIO 100 – THE MICROBIAL WORLD

3 credits.

Primarily for non-science majors. Roles of microorganisms and viruses in nature, health, agriculture, pollution control and ecology. Principles of disease production, epidemiology and body defense mechanisms. Biotechnology and the genetic engineering revolution. Enroll Info: None

Requisites: Not open to students with credit for MICROBIO 101 or 303.

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Summer 2019

MICROBIO 101 – GENERAL MICROBIOLOGY

3 credits.

Survey of microorganisms and their activities; emphasis on structure, function, ecology, nutrition, physiology, genetics. Survey of applied microbiology—medical, agricultural, food and industrial microbiology. Intended to satisfy any curriculum which requires introductory level microbiology. Enroll Info: None

Requisites: CHEM 103, 108, 109, or 115. Not open to students with credit for MICROBIO 303

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO 102 – GENERAL MICROBIOLOGY LABORATORY

2 credits.

Covers techniques and procedures used in general microbiology, including cultivation, enumeration, aseptic techniques, physiology and selected applications. Enroll Info: None

Requisites: MICROBIO 101, 303 or concurrent enrollment. Not open to students with credit for MICROBIO 304.

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO 289 – HONORS INDEPENDENT STUDY

1-2 credits.

Declared in an honors program. Enroll Info: None

Requisites: Declared in an honors program

Course Designation: Honors - Honors Only Courses (H)

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2010

MICROBIO 299 – INDEPENDENT STUDY

1-3 credits.

Research work for students under direct guidance of a faculty member in an area encompassing Microbiology. Students are responsible for arranging the work and credits with the supervising instructor. Enroll Info: None

Requisites: Consent of instructor

Course Designation: Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2020

MICROBIO 303 – BIOLOGY OF MICROORGANISMS

3 credits.

Basic biology of microorganisms, including structure, function, physiology, genetics, ecology, diversity, and evolution. Enroll Info: None

Requisites: (ZOOLOGY/BIOLOGY 101, ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 383, or BIOLOGY/BOTANY 130) and (CHEM 104 or 109) or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO 304 – BIOLOGY OF MICROORGANISMS LABORATORY

2 credits.

Introduction to modern laboratory techniques used to study the distribution and properties of microorganisms. Enroll info: None

Requisites: MICROBIO 303 or concurrent enrollment

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO 305 – CRITICAL ANALYSES IN MICROBIOLOGY

1 credit.

Train students to become scientific problem-solvers, to critically analyze data, and to comprehend the principles of microbiological research via active discussion of a combination of scholarly papers and contemporary, hot topics in our field. Enroll Info: None

Requisites: MICROBIO 303 or concurrent enrollment

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO/FOOD SCI 324 – FOOD MICROBIOLOGY LABORATORY

2 credits.

Lab exercises dealing with food preservation, spoilage, and food poisoning. Isolation, identification and quantification of specific microbes occurring in foods, and food fermentations by bacteria and yeast. Enroll Info: None

Requisites: (MICROBIO 102 or MICROBIO 304) and FOOD SCI/ MICROBIO 325 or concurrent enrollment

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2019

MICROBIO/FOOD SCI 325 – FOOD MICROBIOLOGY

3 credits.

Principles of food preservation, epidemiology of foodborne illness, agents of foodborne illness, food fermentations and biotechnology. Enroll Info: None

Requisites: MICROBIO 101, 303, or M M & I 301 or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2019

MICROBIO 330 – HOST-PARASITE INTERACTIONS

3 credits.

Interrelationships between bacterial and viral parasites and their host cells or tissues. Stresses microbial strategies and mechanisms of colonization, invasion, pathogenesis and resistance of host defenses. Enroll Info: None

Requisites: MICROBIO 101 or 303 or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2018

MICROBIO/AN SCI/BOTANY 335 – THE MICROBIOME OF PLANTS, ANIMALS, AND HUMANS

3 credits.

Examination of the structure and function of microbial communities that live inside and on host organisms (plants, animals, and humans). Introduction to general concepts of the microbiome and microbiota, and their relationship to host nutrition, health, and disease. Enroll Info: None

Requisites: MICROBIO 101 or 303 or graduate/professional standing

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO 375 – SPECIAL TOPICS

1-4 credits.

Specialized subject matter of current interest to undergraduate students.

Enroll Info: None

Requisites: None

Course Designation: Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2020

MICROBIO 399 – COORDINATIVE INTERNSHIP/COOPERATIVE EDUCATION

1-8 credits.

An internship under guidance of a faculty or instructional academic staff member in the Bacteriology department and a internship site supervisor. Students are responsible for arranging the work and credits with the faculty or instructional academic staff member and the internship site supervisor. Enroll Info: None

Requisites: Consent of instructor

Course Designation: Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Workplace - Workplace Experience Course

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2013

MICROBIO 400 – STUDY ABROAD IN MICROBIOLOGY

1-6 credits.

Provides an area equivalency for courses taken on Madison Study Abroad Programs that do not equate to existing UW courses. Enroll Info: None

Requisites: None

Repeatable for Credit: Yes, unlimited number of completions

MICROBIO/SOIL SCI 425 – ENVIRONMENTAL MICROBIOLOGY

3 credits.

Microbial interactions in soils, water, extreme environments and biofilms. Modern methods for studying microbial ecology. role of microbes in nutrient cycles and biogeochemistry. Use of microbes for mitigating manmade environmental problems of industrial, agricultural, and domestic origin. Enroll Info: None

Requisites: MICROBIO 303 and (CHEM 341 or 343), or graduate/professional standing

Course Designation: Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2019

MICROBIO 450 – DIVERSITY, ECOLOGY AND EVOLUTION OF MICROORGANISMS

3 credits.

Fundamental concepts relating to the phylogenetic diversity, ecology and evolution of microbes. Active learning methods applying these concepts will promote a deeper understanding of microbiology. Enroll Info: None

Requisites: MICROBIO 303 or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO 470 – MICROBIAL GENETICS & MOLECULAR MACHINES

3 credits.

Examines modern microbial genetics and molecular processes. Emphasis on the use of eubacterial and eukaryotic microbes to elucidate cellular function. Discussion of experimental approaches to study microbes and their use in biotechnology, bioremediation, and medicine. Enroll Info: None

Requisites: MICROBIO 303 or concurrent enrollment or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO/SOIL SCI 523 – SOIL MICROBIOLOGY AND BIOCHEMISTRY

3 credits.

Transformations of nutrients and contaminants in soils and groundwater by microorganisms: emphasis on enzymatic mechanisms and metabolic pathways. Approaches for analyzing microbial populations and activities including molecular techniques. Applications of microbial activities for bioremediation of contaminated soils and groundwater. Enroll Info: Students should have completed one course in either Soil Science or Microbiology to feel comfortable with the course content.

Requisites: Senior standing, (CHEM 104, 109, or 116) and (ZOOLOGY/BIOLOGY 102, BOTANY/BIOLOGY 130, or ZOOLOGY/BIOLOGY/BOTANY 151), or graduate/professional standing

Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO/BIOLOGY 525 – ADVANCED BIOLOGICAL LABORATORY PRACTICES: A RESEARCH EXPERIENCE

2 credits.

Theory and practice of techniques typically used in microbiological and related biological research; biological experimental data interpretation and analysis; practice writing a research paper, reading primary literature, presenting their work to peers, and self-directing an independent research project (including keeping accurate lab notebooks); critical thinking in controversial scientific research ethics. Enroll Info: None

Requisites: MICROBIO 303 and 304

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

MICROBIO 526 – PHYSIOLOGY OF MICROORGANISMS

3 credits.

Biochemistry of microbial processes. Enroll Info: None

Requisites: (BIOCHEM 501 or 507 or concurrent enrollment) or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO 527 – ADVANCED LABORATORY TECHNIQUES IN MICROBIOLOGY

2 credits.

Provides a foundation in modern methods of research in the biomedical sciences. Coaching and practice in hypothesis-driven scientific questions, critical data analysis, and scientific writing. Enroll Info: None

Requisites: Declared in Microbiology and MICROBIO 304

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2019

MICROBIO/ONCOLOGY 545 – TOPICS IN BIOTECHNOLOGY

1 credit.

Seminars on current topics in agricultural, medical, and industrial biotechnology such as: microbiological production of food, drink, biopharmaceuticals; production methods, genetic engineering (vectors, recombination cloning), continuous fermentation; bioconversion processes and production of chemicals from biomass; plant biotechnology; transgenic animals. Enroll Info: None

Requisites: (ZOOLOGY/BIOLOGY 101, ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 383, or BIOLOGY/BOTANY 130) and (CHEM 104 or 109) or graduate/professional standing

Course Designation: Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2020

MICROBIO 551 – CAPSTONE RESEARCH PROJECT IN MICROBIOLOGY
2 credits.

Conduct independent research in either a PI's laboratory or in small groups in microbiology teaching laboratories. Discuss progress of projects and research ethics, write a research proposal, and prepare and present a poster with final results for the department Poster Session. The in-class students use microbiological, molecular, and bioinformatic approaches to investigate the microbial ecology of environmental microbial communities. Research-lab students will progress toward goals established by the research mentor / PI. Enroll Info: None

Requisites: MICROBIO 527**Course Designation:** Gen Ed - Communication Part B
Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No**Last Taught:** Spring 2020**MICROBIO/GENETICS 607 – ADVANCED MICROBIAL GENETICS**
3 credits.

Molecular genetic methods and related aspects of prokaryotic and lower eukaryotic biology, as well as critical analysis of the scientific literature. Approximately two-thirds of the course will focus on prokaryotes and one-third on lower eukaryotic microbes. Enroll Info: None

Requisites: MICROBIO 470 or GENETICS 468 or graduate/professional standing**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No**Last Taught:** Spring 2018**MICROBIO/BIOCHEM/GENETICS 612 – PROKARYOTIC MOLECULAR BIOLOGY**
3 credits.

Molecular basis of bacterial physiology and genetics with emphasis on molecular mechanisms; topics include nucleic acid-protein interactions, transcription, translation, replication, recombination, regulation of gene expression. Enroll Info: None

Requisites: None**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No**Last Taught:** Fall 2019**MICROBIO 625 – ADVANCED MICROBIAL PHYSIOLOGY**
3 credits.

Focuses on microbial physiology with an emphasis on metabolic processes. Enroll Info: None

Requisites: MICROBIO 526 or (BIOCHEM 507 and 508) or graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2013**MICROBIO 632 – INDUSTRIAL MICROBIOLOGY/BIOTECHNOLOGY**
2 credits.

Application of modern techniques of genetics and physiology to the large-scale production of microbial products; industrial strain improvement; scale-up of microbial processes; survey of industrial processes using microorganisms. Enroll Info: None

Requisites: MICROBIO 526 or (BIOCHEM 507 and 508) or graduate/professional standing**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No**Last Taught:** Spring 2017**MICROBIO 657 – BIOINFORMATICS FOR MICROBIOLOGISTS**
3 credits.

Provides a practical and fundamental introduction to sequence-based analysis focused on microbial systems. Emphasis on gaining a basic understanding of the principles of both classical and newer algorithms useful for bioinformatic analysis. Topics include: BLAST; RNA-seq analysis; transcriptional binding prediction; genome sequence assembly, analysis and annotation; and comparative genomics. Note that this course requires that each student have access to a laptop that runs a linux/unix Operating System such as a Mac or a ChromeBook. PC Laptops running a VM are also acceptable. No prior knowledge of computational biology is required. Enroll Info: None

Requisites: MICROBIO 303, BIOCHEM 501, GENETICS 466, or 467 or graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2019

MICROBIO/BMOLCHEM 668 – MICROBIOLOGY AT ATOMIC RESOLUTION

3 credits.

Three-dimensional protein structures form the basis for discussions of high resolution microbiology; how particular problems are solved with given protein architectures and chemistries and how themes of protein structure are modified and recycled. Enroll Info: None

Requisites: (BIOCHEM 501 or 507) and (MICROBIO 470 or 612) or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2019

MICROBIO 681 – SENIOR HONORS THESIS

2-3 credits.

Individual study for majors completing theses for Honors degrees as arranged with a faculty member. Enroll Info: None

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Honors - Honors Only Courses (H)

Repeatable for Credit: No

Last Taught: Fall 2019

MICROBIO 682 – SENIOR HONORS THESIS

2-4 credits.

Second semester of individual study for majors completing theses for Honors degrees as arranged with a faculty member. Enroll Info: None

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Honors - Honors Only Courses (H)

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO 691 – SENIOR THESIS

2 credits.

Individual study for majors completing theses as arranged with a faculty member. Enroll Info: None

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2018

MICROBIO 692 – SENIOR THESIS

2 credits.

Second semester of individual study for majors completing theses as arranged with a faculty member. Enroll Info: None

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2019

MICROBIO 699 – SPECIAL PROBLEMS

1-4 credits.

Individual advanced work in an area of Microbiology under the direct guidance of a faculty member. Enroll Info: None

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2020

MICROBIO 710 – MICROBIAL SYMBIOSIS

3 credits.

Covers the themes and diversity of plant and animal associations with microbes with an emphasis on beneficial relationships. Examples will be drawn from recent literature. Enroll Info: None

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2019

MICROBIO 731 – SEMINAR

1 credit.

Reviews of microbiological subjects, and reports on research work. Enroll Info: None

Requisites: Declared in Microbiology doctoral program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2020

MICROBIO 810 – CURRENT ISSUES IN MICROBIOLOGY

1 credit.

Explores the diversity of scientific topics comprising the field of contemporary microbiology. Enroll Info: None

Requisites: Declared in Microbiology doctoral program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2019

MICROBIO 811 – ADVANCED PROBLEMS IN MICROBIOLOGY

1 credit.

Explores the diversity of scientific topics comprising the field of contemporary microbiology. Enroll Info: None

Requisites: Declared in Microbiology doctoral program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO 875 – SPECIAL TOPICS

1-4 credits.

Specialized subject matter of current interest to graduate students. Enroll Info: None

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2020

MICROBIO 901 – ADVANCED SEMINAR

1 credit.

Recent advances in specialized areas of microbiology. Enroll Info: None

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2017

MICROBIO/BIOCHEM 917 – REGULATION OF GENE EXPRESSION (ADVANCED SEMINAR)

1 credit.

Analysis of recent literature in topics related to prokaryotic and eukaryotic gene regulation, including regulation of transcription, translation, and genome organization. Enroll Info: None

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2020

MICROBIO 990 – RESEARCH

1-9 credits.

Full lab and literature review of a problem in microbiology. Leads to preparation of thesis and publication. Enroll Info: None

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2020

MICROBIO 999 – SPECIAL PROBLEMS

1-6 credits.

Enroll Info: None

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Summer 2001