

Microbiology and Immunology Courses (MICR)

MICR Courses

This is a list of courses with the subject code MICR. For more information, see Microbiology and Immunology (Carver College of Medicine) in the Catalog.

- MICR:2157 General Microbiology** 3 s.h.
Principles of bacterial and viral diversity, structure, genetics, physiology, and metabolism in contexts of molecular biology, immunology, infectious disease, and environmental microbiology. Prerequisites: BIOL:1411 and CHEM:1110.
- MICR:2158 General Microbiology Laboratory** 2 s.h.
Practice of basic techniques commonly used today for study of easy-to-grow microorganisms; variety of individual and group lab activities that challenge students to apply observations about bacteria and viruses. Corequisites: MICR:2157, if not taken as a prerequisite.
- MICR:3145 Honors in Microbiology Thesis Preparation** 1 s.h.
Guidance and constructive criticism on written and oral presentation of honors research project; submission of thesis introduction; multiple presentations and updates of research project in preparation for final oral presentation at departmental Undergraduate Research Symposium; for honors in the major students and taken final semester before graduation. Prerequisites: MICR:4171.
- MICR:3147 Immunology and Human Disease** 3 s.h.
Important principles and key concepts in immunology with a focus on the involvement of the immune system in disease pathogenesis; overview of innate and adaptive immune systems and their functions at cellular and molecular levels. Prerequisites: BIOL:1411 with a minimum grade of C and BIOL:1412 with a minimum grade of C.
- MICR:3150 Eukaryotic Pathogens and Human Disease** 2 s.h.
Foundational understanding of the lifecycle, epidemiology, pathogenesis, diagnosis, and treatment of major eukaryotic pathogens/parasites that cause human disease. Prerequisites: MICR:2157 with a minimum grade of C. Recommendations: genetics, biochemistry, and immunology.
- MICR:3159 Bacteria and Human Disease** 3 s.h.
Infection and replication strategies of bacteria with an emphasis on human disease; for students interested in microbiology or other biological sciences, epidemiology, and/or health-related occupations. Prerequisites: MICR:2157 with a minimum grade of C.
- MICR:3160 Bacterial Physiology and Cell Biology** 2 s.h.
Bacterial physiology and cell biology with reference to model organisms and adaptations to extreme environments; topics include energy metabolism, growth, cell structure, macromolecular assembly, cell division, microbial development, and microbial interactions; lectures augmented with readings from primary literature to give students a strong foundation in prokaryotic biology and approaches used in modern microbiology research. Prerequisites: (BMB:3110 or BMB:3120) and MICR:2157 with a minimum grade of C.
- MICR:3164 Microbiology and Human Health** 4 s.h.
Microbiology for nursing, pharmacy, and pre-health professions. Prerequisites: BIOL:1411 or BIOL:1140 or BIOL:1141.
- MICR:3165 Bacteria and Human Disease Laboratory and Discussion** 3 s.h.
Use of bacterial genetics and molecular biology techniques and methodologies to study bacteria which cause human disease; development of skills in data analysis and presentation, reading scientific literature, and writing scientific abstracts; for students interested in microbiology or other biological sciences, epidemiology, and/or health-related occupations. Prerequisites: MICR:2157 with a minimum grade of C and MICR:2158 with a minimum grade of C. Corequisites: MICR:3159 or MICR:3170, if not taken as a prerequisite.
- MICR:3168 Viruses and Human Disease** 3 s.h.
Infection and replication strategies of viruses with an emphasis on human disease; for microbiology majors as well as students interested in pre-medicine, biological sciences, epidemiology, and/or other health-related occupations. Prerequisites: BIOL:1412 with a minimum grade of C or MICR:2157 with a minimum grade of C. Recommendations: basic understanding of molecular biology and immunology.
- MICR:3170 Microbial Genetics** 2 s.h.
Genetics of bacteria and bacteriophages including classical, molecular, and genome-wide approaches. Prerequisites: BIOL:2512 with a minimum grade of C or MICR:2157 with a minimum grade of C.
- MICR:3177 Virology Discussion** 2 s.h.
Students read, present, and discuss papers from virology literature that address classic and current issues in virology research. Students will learn how to critically evaluate and present methods and results from virology research papers. Prerequisites: MICR:3168 with a minimum grade of C.
- MICR:3178 Virology Laboratory** 2 s.h.
Practical approaches to studying viruses; basic techniques in virology including virus detection, virus growth measurement, and virus genetics; introduction to bioinformatic analysis of virus genomes and infections. Prerequisites: MICR:2157 with a minimum grade of C and MICR:2158 with a minimum grade of C. Corequisites: MICR:3168 (if not taken as a prerequisite).
- MICR:4161 Undergraduate Research in Microbiology** arr.
Experimental research under faculty supervision. Prerequisites: BIOL:1411.
- MICR:4171 Honors Undergraduate Research in Microbiology** arr.
Experimental research under faculty supervision. Prerequisites: BIOL:1411. Requirements: microbiology major, junior or senior standing, 3.33 overall g.p.a., and 3.33 g.p.a. in microbiology courses.
- MICR:4175 Topics in Parasitism** 1 s.h.
Molecular and immunologic mechanisms by which bacteria, viruses, and protozoa cause human diseases; based on manuscript readings and/or student presentations. Requirements: junior or higher standing in microbiology or related discipline, and current or prior research in a microbiology and immunology laboratory.

- MICR:5218 Microscopy for Biomedical Research** arr. Basic microscopy methods for research including optics, preparation, and analysis of biomedical specimens; light, fluorescence, confocal, transmitting electron, scanning electron, atomic force microscopes, elemental analysis; immunochemistry and stereology techniques; individualized laboratory instruction. Prerequisites: BIOL:2723. Same as ACB:5218, BIOL:5218.
- MICR:5264 Directed Study in Microbiology** arr. Advanced-level experimental research or teaching under faculty supervision.
- MICR:5875 Perspectives in Biocatalysis** 1-3 s.h. Applied enzymology, protein design, structure-activity relationships, biosensor technology, microbial transformations, biodegradation of environmental pollutants. Requirements: graduate standing in a participating department supported by the Predoctoral Training Program in Biotechnology. Same as BMB:5875, CBE:5875, CEE:5875, CHEM:5875, PHAR:5875.
- MICR:6201 Graduate Immunology** 3 s.h. Ontogeny, activation, and function of T lymphocytes and B lymphocytes; innate immune effector mechanisms; major histocompatibility complex; antigen presentation; thymocyte positive and negative selection; signaling of T lymphocytes, B lymphocytes; emphasis on experimental methods for analysis of these processes. Prerequisites: MICR:3147. Requirements: for IMMU:6201—college biology, general chemistry, and introductory immunology courses; for MICR:6201—courses in college biology, genetics, general chemistry, and introductory immunology. Recommendations: for IMMU:6201—courses in biochemistry and genetics; for MICR:6201—biochemistry course. Same as IMMU:6201.
- MICR:6240 Graduate Eukaryotic Pathogens and Human Disease** 2 s.h. Foundational understanding of the lifecycle, epidemiology, pathogenesis, diagnosis, and treatment of major eukaryotic pathogens/parasites that cause human disease. Recommendations: genetics, biochemistry, and immunology.
- MICR:6247 Graduate Immunology and Human Disease** 4 s.h. Important principles and key concepts in immunology with a focus on the involvement of the immune system in disease pathogenesis; overview of innate and adaptive immune systems and their functions at cellular and molecular levels; learning enhanced by case-based, small-group discussion and writing exercises. Same as IMMU:6247.
- MICR:6250 Mechanisms of Parasitism Journal Club** 1 s.h. Reviews of recent publications in molecular parasitology research and thesis research by training grant or journal club students; for students pursuing graduate thesis research in microbiology or a related discipline. Same as MMED:6250.
- MICR:6255 Graduate Experimental Approaches to Molecular Microbiology** 2 s.h. Exposure to common experimental approaches through examination of primary literature and facilitated discussions on application of those approaches to advance scientific inquiry. Requirements: microbiology graduate standing.
- MICR:6259 Graduate Bacteria and Human Disease** 3 s.h. Infection and replication strategies of bacteria with an emphasis on human disease; discussion focuses on experimental approaches used to study mechanisms of disease.
- MICR:6260 Graduate Bacterial Physiology and Cell Biology** 2 s.h. Bacterial physiology and cell biology with reference to model organisms and adaptations to extreme environments; topics include energy metabolism, growth, cell structure, macromolecular assembly, cell division, microbial development, and microbial interactions; lectures augmented with readings from primary literature to give students a strong foundation in prokaryotic biology and approaches used in modern microbiology research.
- MICR:6265 Introduction to Grant Writing** 2 s.h. How to think and write like scientists and become familiar with the elements of a research proposal; writing a grant proposal modeled on a National Institutes of Health Exploratory/Developmental Research Grant Award (NIH R21); students critique proposals written by other students; faculty read proposals and provide constructive criticism; lectures describe elements of a grant proposal and strategies for effective writing. Requirements: enrollment in microbiology graduate program, or enrollment in a graduate program training in a microbiology and immunology department laboratory, or enrollment in a biological science graduate program and not working in a microbiology and immunology department laboratory for thesis project.
- MICR:6267 Graduate Viruses and Human Disease** 4 s.h. Infection and replication strategies of viruses with an emphasis on human disease; discussion focuses on topics and techniques used in primary literature and development of specific aims for a mini-proposal.
- MICR:6268 Biology and Pathogenesis of Viruses** 2 s.h. Molecular biology of animal DNA and RNA viruses, viral immunology and pathogenesis, and interaction of these viruses with eucaryotic cells; mechanisms of viral latency, persistence, cellular transformation, oncogenesis; virology literature. Prerequisites: MICR:3168 or MICR:6267.
- MICR:6269 Graduate Virology Discussion** 1 s.h. Discussion of primary virology literature from a range of topics, may include techniques used for studying viruses, viral entry and replication, evasion of immune responses by viruses, vaccines, and viral pathogenesis; short presentations; development of specific aims for a mock grant proposal on a virology-related topic. Recommendations: completion of a virology course.
- MICR:6270 Graduate Microbial Genetics** 2 s.h. Genetics of bacteria and bacteriophages including classical, molecular, and genome-wide approaches.
- MICR:7207 Advanced Topics in Immunology** 3 s.h. In-depth analysis of selected areas. Prerequisites: IMMU:6201 or MICR:6201. Same as IMMU:7221.
- MICR:7261 Graduate Research in Microbiology** arr. Requirements: microbiology graduate standing.
- MICR:7263 Graduate Student Research Seminar** 1 s.h. Presentation of thesis work in progress. Requirements: microbiology graduate standing.
- MICR:7265 Topics in Virology Literature** 1 s.h. Papers of current interest in primary virology literature.
- MICR:8230 Dental Microbiology** 3 s.h. Medical microbiology: bacteriology, immunology, pathogenic bacteriology, virology, mycology, parasitology. Requirements: D.D.S. enrollment.