## Microbiology and Immunology Courses (MICR)

This is a list of microbiology and immunology courses. For more information, see Microbiology and Immunology.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>MICR:2158</td>
<td>General Microbiology Laboratory</td>
<td>2 s.h.</td>
<td>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.</td>
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<tr>
<td>MICR:3147</td>
<td>Immunology and Human Disease</td>
<td>3 s.h.</td>
<td>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.</td>
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<tr>
<td>MICR:3150</td>
<td>Eukaryotic Pathogens and Human Disease</td>
<td>2 s.h.</td>
<td>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.</td>
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<tr>
<td>MICR:3159</td>
<td>Bacteria and Human Disease</td>
<td>3 s.h.</td>
<td>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.</td>
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<tr>
<td>MICR:3160</td>
<td>Bacterial Physiology and Cell Biology</td>
<td>2 s.h.</td>
<td>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: (Biol:3110 or Bioc:3120) and MICR:2157 with a minimum grade of C.</td>
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<td>MICR:3164</td>
<td>Microbiology and Human Health</td>
<td>4 s.h.</td>
<td>Microbiology for nursing, pharmacy, and pre-health professions. Prerequisites: Biol:1411 or Biol:1140 or Biol:1141.</td>
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<tr>
<td>MICR:3165</td>
<td>Bacteria and Human Disease Laboratory and Discussion</td>
<td>3 s.h.</td>
<td>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.</td>
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<tr>
<td>MICR:3168</td>
<td>Viruses and Human Disease</td>
<td>3 s.h.</td>
<td>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.</td>
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<tr>
<td>MICR:3177</td>
<td>Virology Discussion</td>
<td>1 s.h.</td>
<td>Students read and discuss papers from virology literature that address current issues in virology. Prerequisites: MICR:2157 with a minimum grade of C. Corequisites: MICR:3168 (if not taken as a prerequisite).</td>
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<tr>
<td>MICR:3178</td>
<td>Virology Laboratory</td>
<td>2 s.h.</td>
<td>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).</td>
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<tr>
<td>MICR:4161</td>
<td>Undergraduate Research in Microbiology</td>
<td>arr.</td>
<td>Experimental research under faculty supervision. Prerequisites: Biol:1411.</td>
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<tr>
<td>MICR:4163</td>
<td>Seminar: Microbiology</td>
<td>2 s.h.</td>
<td>Current topics in microbiology, immunology, and virology. Prerequisites: 2 of the following are required: MICR:3147 with a minimum grade of C, MICR:3159 with a minimum grade of C, MICR:3160 with a minimum grade of C, MICR:3168 with a minimum grade of C, MICR:3170 with a minimum grade of C. Requirements: senior standing.</td>
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<tr>
<td>MICR:4171</td>
<td>Honors Undergraduate Research in Microbiology</td>
<td>arr.</td>
<td>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.</td>
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<tr>
<td>MICR:4175</td>
<td>Topics in Parasitism</td>
<td>1 s.h.</td>
<td>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.</td>
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**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 BIOC: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. 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 microbiology and immunochemistry techniques; individualized 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.  