

# MICROBIOLOGY (MCRO)

## Additional Resources

- Catalog Course Search (<https://catalog.unc.edu/course-search/>)
- Course Numbering Guide (<https://catalog.unc.edu/courses/course-numbering/>)
- Scheduled Classes (<https://reports.unc.edu/class-search/>)
- Historical Course Record ([https://reports.unc.edu/historical\\_course\\_record/](https://reports.unc.edu/historical_course_record/))

## Courses

### MCRO 251. Introductory Medical Microbiology. 4 Credits.

Required preparation, one semester of a basic undergraduate science class. An introductory course in microbiology that focuses on the structure, biology, and genetics of microbes in relation to human disease and the immune system. For students planning careers in pharmacy, nursing, dental hygiene, and related fields. A laboratory is required.

#### Rules & Requirements

**Grading Status:** Letter grade.

### MCRO 291. Undergraduate Learning Apprentice. 1 Credits.

Permission required. Experience includes preparations, demonstrations, assistance, and attendance at weekly meetings. Apprentices will not be involved in any aspects of grading.

#### Rules & Requirements

 **IDEAs in Action Gen Ed:** HI-LEARNTA.

**Making Connections Gen Ed:** EE - Undergraduate Learning Assistant, ULA.

**Requisites:** Prerequisite, MCRO 251; a grade of B or better in MCRO 251 is required.

**Repeat Rules:** May be repeated for credit. 3 total credits. 3 total completions.

**Grading Status:** Pass/Fail.

### MCRO 292. Undergraduate Learning Assistant. 2 Credits.

Permission required. Experience includes preparations, demonstrations, assistance, and attendance in weekly meetings.

#### Rules & Requirements

 **IDEAs in Action Gen Ed:** HI-LEARNTA.

**Making Connections Gen Ed:** EE - Undergraduate Learning Assistant, ULA.

**Requisites:** Prerequisite, MCRO 251; a grade of B or better in MCRO 251 is required.

**Repeat Rules:** May be repeated for credit. 4 total credits. 2 total completions.

**Grading Status:** Pass/Fail.

### MCRO 449. Introduction to Immunology. 3 Credits.

This course provides a general overview of the evolution, organization, and function of the immune system. Instruction will be inquiry-based with extensive use of informational and instructional technology tools.

#### Rules & Requirements

**Requisites:** Prerequisites, BIOL 205; or BIOL 103, BIOL 104, and BIOL 240; or permission of the instructor for students lacking the prerequisites.

**Grading Status:** Letter grade.

**Same as:** BIOL 449.

### MCRO 614. Immunobiology. 3 Credits.

A strong background in molecular biology, eukaryotic genetics, and biochemistry is required. Advanced survey course with topics that include molecular recognition, genetic mechanisms of host resistance, development of cells and cell interactions; hypersensitivity, autoimmunity, and resistance to infection. Course material from textbook and primary literature.

#### Rules & Requirements

**Grading Status:** Letter grade.

### MCRO 630. Virology. 3 Credits.

Required preparation, coursework in molecular biology and cell biology. Current concepts of the chemistry, structure, replication, genetics, and the natural history of animal viruses and their host cells.

#### Rules & Requirements

**Grading Status:** Letter grade.

### MCRO 631. Advanced Molecular Biology. 4 Credits.

This course explores cutting edge research in molecular biology – the investigation at molecule-scale of the mechanisms behind life. We briefly review core-principles in molecular biology, then investigate more recent research that extends or overturns these core principles.

#### Rules & Requirements

**Requisites:** Prerequisites, BIOL 202, or BIOL 220, or CHEM 430, and permission of the course director.

**Grading Status:** Letter grade.

**Same as:** GNET 631, BIOC 631, BIOL 631.

### MCRO 632. Advanced Molecular Biology II. 3 Credits.

Required preparation for undergraduates, at least one undergraduate course in both biochemistry and genetics. The purpose of this course is to provide historical, basic, and current information about the flow and regulation of genetic information from DNA to RNA in a variety of biological systems. Three lecture hours a week.

#### Rules & Requirements

**Grading Status:** Letter grade.

**Same as:** GNET 632, BIOC 632, BIOL 632.

### MCRO 635. Microbial Pathogenesis I. 3 Credits.

Permission of the instructor. Required preparation, coursework in molecular biology and genetics. Topics will include aspects of basic bacteriology as well as bacterial and fungal pathogens and mechanisms of disease.

#### Rules & Requirements

**Grading Status:** Letter grade.

### MCRO 640. Microbial Pathogenesis II. 3 Credits.

Permission of the instructor or a fundamental understanding of molecular virology and immunology. Molecular pathogenesis, with a primary focus on viral pathogens. Additional topics include vaccines and genetics of host-pathogen interactions.

#### Rules & Requirements

**Grading Status:** Letter grade.

**MCRO 690. Special Topics in Microbiology or Immunology. 1-15 Credits.**

Permission of the department except for department majors. Designed to introduce the student to research methods. Minor investigative problems are conducted with advice and guidance of the staff. Hours and credit to be arranged, any term. May be repeated for credit two or more semesters.

**Rules & Requirements**

**Repeat Rules:** May be repeated for credit; may be repeated in the same term for different topics; 15 total credits. 5 total completions.

**Grading Status:** Letter grade.

**MCRO 701. Seminar in Microbiology and Immunology. 1 Credits.**

Faculty and student seminars on current research in microbiology and immunology.

**Rules & Requirements**

**Repeat Rules:** May be repeated for credit.

**Grading Status:** Letter grade.

**MCRO 702. Seminar in Microbiology. 1 Credits.**

Seminar on selected topics in microbiology.

**Rules & Requirements**

**Repeat Rules:** May be repeated for credit.

**Grading Status:** Letter grade.

**MCRO 705. Data and Molecular Visualization for Biomedical Research. 2 Credits.**

This is an introductory course focused on methods to visualize scientific data and molecular structures. The course will include: R to visualize various biomedical data and generate multiple publication-ready figures and tables, phylogenetic analysis using R and other tools, and PyMol to visualize and analyze molecular structures and create images for publication. This course will also include a large codebase on using R and state-of-art packages to summarize and visualize various data types.

**Rules & Requirements**

**Requisites:** Prerequisites, Knowledge of introductory biochemistry and molecular biology is required; Previous experiences with R and PyMol are NOT necessary for attending this class; Personal computer with 1GB RAM (4GB recommended) and three-button mouse required.

**Grading Status:** Letter grade.

**MCRO 710. Seminar/Tutorial in Bacterial and Eukaryotic Microbes. 1-15 Credits.**

One or two faculty and a small number of students will consider current research of importance in depth. Emphasis is on current literature, invited speakers, etc., rather than textbooks.

**Rules & Requirements**

**Repeat Rules:** May be repeated for credit. 15 total credits. 15 total completions.

**Grading Status:** Letter grade.

**MCRO 711. Seminar/Tutorial in Animal Virology. 1-15 Credits.**

One or two faculty and a small number of students consider current research of importance in depth. Emphasis is on current literature, invited speakers, etc., rather than textbooks.

**Rules & Requirements**

**Repeat Rules:** May be repeated for credit. 15 total credits. 99 total completions.

**Grading Status:** Letter grade.

**MCRO 712. Seminar/Tutorial in Immunology. 1-15 Credits.**

One or two faculty and a small number of students consider current research of importance in depth. Emphasis is on current literature, invited speakers, etc., rather than textbooks.

**Rules & Requirements**

**Repeat Rules:** May be repeated for credit.

**Grading Status:** Letter grade.

**MCRO 721. Refresher Training in the Responsible Conduct of Research. 1 Credits.**

MCRO 721 is a modular course that meets the requirements of the National Institutes of Health for refresher training in the Responsible Conduct of Research. The course involves a mixture of assigned readings, formal presentations by department faculty who are active in research, and small group discussions. The course grade is based on attendance and participation.

**Rules & Requirements**

**Grading Status:** Letter grade.

**MCRO 730. Cancer Immunology. 2 Credits.**

The goal of this graduate-level course is to learn about recent advances in the field, acquire specialized knowledge and to develop a foundation of critical thinking skills in cancer immunology. The course format will combine lectures and in-class discussion of assigned readings, with particular emphasis on state-of-the art research methods. Students should be familiar with modern concepts of immunology and should consult with the course director before enrolling. The course meets for half a semester.

**Rules & Requirements**

**Grading Status:** Letter grade.

**Same as:** PATH 730.

**MCRO 790. Directed Readings in Prokaryotic Molecular Biology. 1 Credits.**

Permission of the instructor or one prior prokaryotic molecular biology course. Directed readings in prokaryotic molecular biology under the direction of a member of the graduate faculty. May be repeated for credit.

**Rules & Requirements**

**Repeat Rules:** May be repeated for credit.

**Grading Status:** Letter grade.

**MCRO 791. Directed Readings in Virology. 1 Credits.**

Permission of the instructor or one prior virology course. Directed readings in virology under the direction of a member of the graduate faculty. May be repeated for credit.

**Rules & Requirements**

**Repeat Rules:** May be repeated for credit.

**Grading Status:** Letter grade.

**MCRO 792. Directed Readings in Immunology. 1 Credits.**

Permission of the instructor or one prior immunology course. Directed readings in immunology under the direction of a member of the graduate faculty. May be repeated for credit.

**Rules & Requirements**

**Repeat Rules:** May be repeated for credit.

**Grading Status:** Letter grade.

**MCRO 795. Research Concepts. 2 Credits.**

Permission of the instructor. This course will provide multiple opportunities for the student to write parts of hypothesis-based proposals, receive substantial feedback, and to rewrite the text. There will be approximately twelve single-page writing assignments.

**Rules & Requirements**

**Grading Status:** Letter grade.

**MCRO 901. Research in Microbiology or Immunology. 1-15 Credits.**

Permission of the department. Designed to introduce the student to research methods and special techniques. Short-term problems are conducted with the advice and guidance of the staff. May be repeated for credit.

**Rules & Requirements**

**Repeat Rules:** May be repeated for credit.

**Grading Status:** Letter grade.

**MCRO 993. Master's Research and Thesis. 3 Credits.****Rules & Requirements**

**Repeat Rules:** May be repeated for credit.

**MCRO 994. Doctoral Research and Dissertation. 3 Credits.****Rules & Requirements**

**Repeat Rules:** May be repeated for credit.