

# Microbiology (MICROB)

## **MICROB 2800: Microbiology for Nursing and Health Professions**

This course will provide basic principles for understanding microbial growth, function, and control. This includes a survey of microbial cellular structure/functions, immunology concepts, epidemiology, specimen handling, and causes of microbial disease (bacterial, viral, and parasitic). Material is presented in lecture and corresponding laboratory exercises that will allow students to explore the microbial world around them.

**Credit Hours:** 4

**Prerequisites:** The overall content is "restricted to Freshman and sophomore Nursing and Health Related Professional students only". Other inquires contact department

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## **MICROB 2800H: Microbiology for Nursing and Health Professions - Honors**

This course will provide basic principles for understanding microbial growth, function, and control. This includes a survey of microbial cellular structure/functions, immunology concepts, epidemiology, specimen handling, and causes of microbial disease (bacterial, viral, and parasitic). Material is presented in lecture and corresponding laboratory exercises that will allow students to explore the microbial world around them.

**Credit Hours:** 4

**Prerequisites:** Honors eligibility required; The overall content is "restricted to Freshman and sophomore Nursing and Health Related Professional students only". Other inquires contact department

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## **MICROB 3200: Medical Microbiology and Immunology**

Focus on medically important viruses, bacteria, fungi and parasites with emphasis on their disease causing potential and mechanisms. Introduction to cells and molecules of the immune system with emphasis on their role in fighting infectious diseases. Discussion of treatment and prevention strategies. Lecture material will be reinforced with laboratory demonstrations and hands-on exercises. The course is intended for preprofessional students.

**Credit Hours:** 4

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## **MICROB 3800: Case-Based Microbiology: Assembling Systemic Health Connections**

Detailed infectious diseases across organ systems. The biological characteristics and pathologic mechanisms of infectious diseases caused by bacteria, viruses, fungi and parasites are explored in a case-based learning. Student-driven learning objectives for each case (to include microbiology, anatomy, physiology, pharmacology, technology and clinical LO's each case) help groups connect scientific information across disciplines.

**Credit Hours:** 3

**Prerequisites:** Instructor's consent

**Recommended:** MICROB 2800 or MICROB 3200, MPP 3202, and PTH\_AS 2201

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## **MICROB 4304: Immunology for Health Professions**

This is a basic immunology course covering cells and organs of the immune system, lymphocyte development, innate immunity, antibody production, antibody-antigen presentation, CD4+ and CD8+ T lymphocyte responses, cytokines, autoimmunity and immunodeficiency among other immunologically relevant topics. Completion of a biochemistry, genetics, or molecular biology course would be helpful. Graded on A-F basis only.

**Credit Hours:** 3

**Recommended:** MICROB 3200 or BIOCHM 4270 or MICROB 2800

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## **MICROB 8050: Graduate Student Survival Skills**

This course is an introduction to inform new graduate students about the Microbiology program and provide them with the knowledge to access resources and information needed for a successful transition into their course work and research. The course will also focus on guidelines in selecting mentors and their relationships, time management, good notebook practices, presentation and posters, comprehensive exams, and computer skills needed. Graded on A-F basis only.

**Credit Hour:** 1

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## **MICROB 8070: Professional Communication Development**

(same as BIOCHM 8070, BIO\_SC 8070). The purpose of this course is to develop professional communication skills in students that are planning to attend graduate school or are in their first year of graduate training. Graded on A-F basis.

**Credit Hour:** 1-2

**Prerequisites:** Graduate standing is required. Graduate students must be enrolled in one of the PhD programs in the life sciences at MU and have completed less than 30 credit hours of graduate study at MU. Graduate students who participate in the IMSD T32 training program are required to take this class. IMSD T32 trainees are students who are enrolled in one of four PhD programs (Biochemistry, Biology, Translational Biosciences, or BBCE) and meet the T32 eligibility criteria in the biomedical sciences. Other graduate students in their first year of graduate school will be allowed to take this class, with permission of the instructor

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## **MICROB 8303: Fundamental Virology**

Classification of viruses, life cycles, genome organization and expression, host-virus interactions, oncogenes and cellular transformation, viral pathogenesis, viral gene therapy approaches, strategies for anti viral therapy. Graded on A-F basis only.

**Credit Hours:** 2

**Prerequisites:** Undergraduates require instructor's consent. This course will include evaluation of current literature and require paper presentations

**Recommended:** All students in the PhD programs in the Translational Biosciences PhD program will be required to take one course outside of their research/ program interest. This would be an option to them

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**MICROB 8304: Immunology**

Covers innate immunity, antibodies, antigens, MHC, antigen presentation, lymphocyte development, antigen specific receptors, lymphocyte activation and differentiation, immune effector mechanisms, hypersensitivities, tolerance, autoimmunity, immunodeficiencies. Graded on A-F basis only.

**Credit Hours:** 3

**Prerequisites:** Undergraduates require instructor's consent. This course will include evaluation of current literature and require paper presentations

**Recommended:** All students in the PhD programs in the Translational Biosciences PhD program will be required to take one course outside of their research/ program interest. This would be an option to them

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**MICROB 8404: Foundations in Bacterial Pathogenesis**

This team taught course covers the biology and virulence mechanisms of bacterial pathogens, with emphasis on those causing human and zoonotic disease. Topics covered include bacterial structure, genetics, physiology, and metabolism; antibiotic resistance; host-pathogen interactions; microbiomes and emerging pathogens. Graded on A-F basis only.

**Credit Hours:** 2

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**MICROB 9001: Topics in Microbiology**

Current topics, highly specialized topics taught infrequently, or courses taught by visiting professors.

**Credit Hour:** 1-99

**Prerequisites:** instructor's consent

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**MICROB 9087: Seminar in Microbiology**

Presentation and critical discussion of student and faculty research, current literature, and guest lectures on subjects in various areas of microbiology. Graded on A-F basis only.

**Credit Hour:** 1

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**MICROB 9090: Research in Microbiology**

Original investigations in various areas of microbiology related to bacteria, fungi, rickettsia, viruses, and animal parasites, or immunology relating to antigens and antibodies of infectious and noninfectious nature designed for graduate thesis research. Graded on a S/U basis only.

**Credit Hour:** 1-99

**Prerequisites:** instructor's consent

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**MICROB 9403: Advanced Medical Microbiology**

Similar to MICROB 4300 but treats medical microbiology and immunology in a more advanced manner. Methods of preparation and instruction stressed. Graded on A-F basis only.

**Credit Hours:** 2

**Prerequisites:** instructor's consent

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**MICROB 9404: Advanced Bacterial Pathogenesis**

Literature based lectures and discussions covering current issues in bacterial pathogenesis. Focus is on understanding host-pathogen interactions that lead to disease. Topics include bacterial toxins and secreted virulence factors, intracellular bacterial growth and survival, host cell death and inflammatory pathways. Course will focus on a few model pathogens and discuss the molecular mechanisms of the pathogen and host that contribute to virulence. Graded on A-F basis only.

**Credit Hours:** 4

**Prerequisites:** MICROB 8404

**Recommended:** MICROB 4304 or MICROB 8304

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**MICROB 9407: Advanced Immunology**

Literature based lectures and discussions covering current issues in molecular and cellular immunology. Topics include innate immunity; lymphocyte development; inflammation; tolerance, infection, and autoimmunity; mucosal immunity; asthma and allergy and tumor immunology.

**Credit Hours:** 4

**Prerequisites:** MICROB 4304 or MICROB 7304, or instructor's consent

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**MICROB 9432: Molecular Biology II**

(same as BIOCHM 9432, BIO\_SC 9432). Detailed experimental analysis of eukaryotic cellular and molecular biology relevant to cellular and viral gene expression, post-transcriptional and post-translational modifications and genome replication. Models for developmental genetic analysis and genetic determinants controlling developmental processes utilizing the current literature will be examined.

**Credit Hours:** 4

**Prerequisites:** MICROB 9430

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**MICROB 9449: Infection and Immunity**

Writing, discussion, literature driven course, covering topics that focus on the interface between infectious diseases, cancer and the immune system. May be repeated for credit. Graded A-F basis only.

**Credit Hours:** 4

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**Prerequisites:** 2nd year Graduate student with bacteriology, virology, microbial pathogenesis and immunology background only. 1st year graduate students require instructor approval

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