

# MICROBIOLOGY & IMMUNOLOGY (MBIO)

Subject-area course lists indicate courses currently active for offering at the University of Louisville. Not all courses are scheduled in any given academic term. For class offerings in a specific semester, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>).

500-level courses generally are included in both the undergraduate- and graduate-level course listings; however, specific course/section offerings may vary between semesters. Students are responsible for ensuring that they enroll in courses that are applicable to their particular academic programs.

## Course Fees

Some courses may carry fees beyond the standard tuition costs to cover additional support or materials. Program-, subject- and course-specific fee information can be found on the Office of the Bursar website (<http://louisville.edu/bursar/tuitionfee>).

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### MBIO 600. Lab Rotations 1-2 Units

**Grading Basis:** Pass/Fail

**Description:** Research experience in different faculty members' laboratories in areas of interest to the student. The purpose is to help the student select a Research Advisor. Acceptance by the faculty members is required. The course consists of one or two laboratory rotations (one rotation per quarter) with one credit hour per rotation. This course may be taken more than once if deemed necessary. Fall and spring semesters only. Pass/fail grading.

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### MBIO 601. Molecular Microbiology 2 Units

**Term Typically Offered:** Fall Only

**Description:** The course is an introduction to microbiology, focusing on the molecular make-up, function, and diversity of microorganisms, primarily bacteria. The pathogenic potential of bacteria will also be explored. Fall semester only. Graded.

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### MBIO 602. Immunology 3 Units

**Prerequisite(s):** Permission of course directors.

**Description:** This course provides an advanced introduction to innate and adaptive immunity at cellular and molecular levels including: identification of the cells of the immune system and their roles in various immune responses, the role and mechanisms of intercellular communication in induction and regulation of immune responses, gene rearrangement in formation of antigen receptors, regulation of antibody responses in response to infection, cytotoxic T cell responses against tumors and infectious agents, hypersensitivity reactions and autoimmunity.

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### MBIO 604. General Virology 1 Unit

**Description:** This is an introductory course that focuses on building basic virology concepts including the basic replication steps common to viruses, entry, replication and egress, interaction of virus with host cellular proteins during the replication cycle, general virus replication cycle, how and why some viruses cause disease (viral pathogenesis), and how viral diseases spread (mode of transmission), and current approaches of vaccines and antivirals. Format: lectures, student presentations. Graded.

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### MBIO 606. Seminar 1 Unit

**Grading Basis:** Pass/Fail

**Prerequisite(s):** Consent of instructor.

**Description:** Pass/Fail grading.

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### MBIO 610. Methods and Analysis in the Biomedical Sciences 2 Units

**Description:** The primary goal of the course is to provide first-year graduate students with the conceptual framework to become familiar with key tools and techniques used in biomedical science research. We will examine the kind of information the methodology can provide, the strengths and weaknesses of the approach, and how data obtained can be judged and used to address scientific problems.

**Note:** Cross-listed with ASNB 610, BIOC 610, PHTX 610, PHZB 610.

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### MBIO 618. Topics in Advanced Microbiology 1-3 Units

**Prerequisite(s):** Consent of instructor.

**Description:** An in-depth examination of one or more topics not included in regularly offered courses in the curriculum. Topics vary.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

### MBIO 619. Research 1-12 Units

**Grading Basis:** Pass/Fail

**Prerequisite(s):** Consent of instructor.

**Description:** Pass/Fail grading.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

### MBIO 620. Thesis 1-6 Units

**Grading Basis:** Pass/Fail

**Prerequisite(s):** Consent of instructor.

**Description:** Pass/Fail grading.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

**MBIO 621. Advanced Immunology: Innate and Adaptive Immunity 2 Units****Prerequisite(s):** MBIO 602 or consent of instructor.**Description:** This is an advanced interdisciplinary graduate level course focused on acquiring deeper knowledge about cells and associated concepts involved in innate and acquired immunity. The cells include dendritic cells, macrophages, neutrophils, innate lymphoid cells, NK cells and T cells. Concepts such as cell differentiation, development, activation and function, antigen presentation, thymic selection, and cell cross-talk will be discussed. Format: short lectures, analysis of pertinent high-profile papers. Graded.For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)**MBIO 622. Advanced Immunology of Disease 2 Units****Prerequisite(s):** MBIO 602 or consent of instructor.**Description:** The course focuses on the immune system in the context of disease with particular emphasis on Autoimmunity, Cancer, and Transplantation, and in particular, the cellular and molecular components of immune responses that perpetuate or protect against graft rejection, autoimmunity, and cancer. Format: short lectures, analysis of pertinent high-profile papers. Graded.For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)**MBIO 623. Scientific Writing and Hypothesis Testing 1 Unit****Grading Basis:** Pass/Fail**Term Typically Offered:** Summer Only**Prerequisite(s):** Permission of instructor.**Description:** This course will teach students writing and presentation skills necessary to compete successfully for grant funding, and more generally to succeed as a scientist. Topics covered in this course include how to write Abstract, Specific aims, Significance and Approach sections, and how to prepare an effective biosketch. Didactic lectures on these topics will be combined with in class presentations by students.For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)**MBIO 631. Basic Microbiology and Immunology 5 Units****Term Typically Offered:** Summer Only**Prerequisite(s):** Consent of instructor.**Description:** A general course in infectious diseases and immunology. Special emphases are placed on oral infections, immune phenomena, and natural resistance mechanisms. Specific topics include the human immune response, pathogenesis of microbial infections, molecular and microbiological basis of periodontal diseases, pulp and periapical infections and cariogenesis. Graded. Summer semester only.For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)**MBIO 687. Microbial Pathogenesis 2 Units****Term Typically Offered:** Spring Only**Prerequisite(s):** MBIO 601, BIOG 645, or consent of instructor.**Description:** A detailed discussion of host-parasite interactions, focusing on the characteristics (i.e., virulence factors) of bacteria that enable them to cause disease. Exotoxins, capsules, adherence mechanisms, intracellular replication, and iron metabolism will be described in detail. Specific bacterial diseases will be examined to illustrate how each virulence factor is required in the infectious process. The use of animals and other model systems will be discussed. Graded. Spring.For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)**MBIO 689. Microbiota in Health and Disease 2 Units****Description:** This is an advanced interdisciplinary graduate level class focused on composition of the microbiota and its role in health and various diseases from birth through death. These diseases include allergies, irritable bowel disease, metabolic diseases and cancer. Factors that influence composition of the microbiota, such as breast vs formula feeding infants, antibiotic treatment, diet in adulthood, hygiene, and the consequences on various diseases, such as obesity and metabolic diseases, will be discussed. The role of fecal transplants, probiotics and prebiotics in alleviating the harmful effects of imbalance of the microbiota will be discussed. Format: short lectures, analysis of pertinent high-profile papers. Graded.For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)**MBIO 690. Research Methods in Microbiology and Immunology 2 Units****Grading Basis:** Pass/Fail**Term Typically Offered:** Fall Only**Description:** A series of lectures and laboratory demonstrations emphasizing current research techniques used in areas of immunology, virology, microbiology, biochemistry and molecular biology. A limited amount of hands-on experience may be utilized in some areas. Fall semester only. Pass/fail grading.For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)