MICROBIOLOGY AND IMMUNOLOGY (MICR)

MICR 365. Infection and Immunity (Dental Hygiene). 2 Hours.
Semester course; 2 lecture hours. 2 credits. A study of infectious diseases and the immune system of humans with emphasis on the distribution properties and roles of pathogenic microorganisms and the varied responses of the host, with emphasis on oral pathologies. Principles of prevention, control and chemotherapy of infectious diseases are major components of the course.

MICR 501. Infection and Immunity (Pharmacy). 4 Hours.
Semester course; 4 lecture hours. 4 credits. Offered to pharmacy students in the first professional year. Others admitted with permission of instructor. A course on the fundamentals of microbiology and immunology with aspects on disease and treatment of interest to dentistry and pharmacy.

MICR 505. Immunobiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Background in cellular and molecular biology, and biochemistry is recommended. Nondegree-seeking students admitted with permission of instructor. A survey of immunobiology as a total host response to foreign agents, covering the nature of antigens and antibodies, antigen-antibody reactions, immunocompetent cells, allergic reactions, tumor immunology, transplantation immunology, immunological diseases and immunogenetics.

MICR 513. Infection and Immunity (Dentistry). 4 Hours.
Semester course; 4 lecture hours. 4 credits. Offered to dental students in the first professional year. Others admitted with permission of instructor. A course on the fundamentals of microbiology and immunology with aspects on disease and treatment of interest to dentistry and pharmacy.

MICR 515. Principles of Molecular Microbiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A comprehensive course designed to provide the student with a thorough understanding of microbial physiology, genetics and diversity. Also covered are some basic concepts in microbial pathogenesis and in applied microbiology. The course focuses on structural and functional characteristics of micro-organisms; ecological and physiological diversity of microbes; growth and control of micro-organisms; genetics of bacteria and viruses; bacteria as agents of disease; and applications of microbiology.

MICR 605. Prokaryotic Molecular Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOC 530, BIOC 531, BIOC 532 and BIOC 533; or BIOC 503 and BIOC 504; or permission of instructor; MICR 515 or equivalent recommended. A comprehensive introductory course examining the organization of the genetic material in bacteria and their viruses and the molecular mechanisms involved in its maintenance, replication, exchange and expression. Emphasis will be on experimental approaches integrating classical and modern methods of genetic analysis with biochemical studies of genetic regulatory mechanisms.

MICR 607. Techniques in Molecular Biology and Genetics. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisites: MICR 515 or equivalent; permission of instructor. Designed to give an overview of the techniques utilized in modern molecular biology. The principles underlying techniques such as plasmid cloning, RNA and DNA analysis, PCR, DNA sequencing, mutagenesis, genomic mapping, heterologous gene expression, CRISPR-mediated genome editing, production and analysis of recombinant proteins, application of mass spectrometry and microscopy techniques, and transgenic mouse technology will be discussed in detail by experts in the field.

MICR 608. Introduction to Microbiology and Immunology Research I. 4 Hours.
Semester course; 4 laboratory hours. 4 credits. Enrollment requires permission of the instructor. Required of all first-year graduate students. Introduction to all active research programs in microbiology and immunology. Rotation of students through faculty laboratories to gain direct exposure to individual research projects. Graded as Pass/Fail.

MICR 609. Introduction to Microbiology and Immunology Research II. 4 Hours.
Semester course; 4 laboratory hours. 4 credits. Enrollment requires permission of the instructor. Required of all first-year graduate students. Introduction to all active research programs in microbiology and immunology. Rotation of students through faculty laboratories to gain direct exposure to individual research projects. Graded as Pass/Fail.

MICR 616. Mechanisms of Viral and Parasite Pathogenesis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A comprehensive introduction to the basic principles of virology and human parasitology. Interactions of the infecting agents and hosts will be stressed at the molecular and cellular level.

MICR 618. Molecular Mechanisms of Microbial Pathogenesis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students who have completed undergraduate-level courses in microbiology or microbial physiology, immunology, and molecular genetics. The goals of this comprehensive course are to explore in detail the virulence mechanisms of microbes and the response of the infected host. The focus will be on important microbial pathogens.

MICR 684. Molecular Biology & Pharmacology of Cancer. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MICR 515 or equivalent; BIOC 503 or BIOC 504; or by permission of the instructor. Advanced graduate-level course to provide theoretical background to graduate students interested in cancer research. Emphasis will be placed on experimental approach integrating classical and modern methods of genetic analysis with biochemical and pharmacological studies. The course includes presentations by students and interactive discussion of the scientific literature in the area of oncogenesis.

MICR 686. Advanced Immunobiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open primarily to residents, medical students and graduate students with an immunology background such as MICR 505. Lectures, seminars, conferences on basic and clinical immunobiology and literature review on the topic, with more emphasis on methods in immunology research and exercising the ability to communicate the topic verbally. Topics have included tumor immunology, cell interactions in the immune response, genetics of the immune response, mechanisms of host-defense and membrane receptors in immunology and neoplasia.

MICR 688. Theoretical Models of Immunology. 2 Hours.
Semester course; 2 lecture hours (delivered hybrid). 2 credits. Prerequisites: MICR 505; or MEDI 150; or by permission of the course director. Enrollment is restricted to graduate students. Background in cellular and molecular biology, and biochemistry is recommended. The course provides a survey of theoretical models of immunology applied to immune-related diseases as well as understanding of the decision-making for the immune system.

MICR 690. Microbiology Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Presentation and discussion of research reports and topics of current interest to the departmental seminar or special group seminars.

MICR 691. Special Topics in Microbiology. 1-4 Hours.
Semester course; 1-4 credits. Lectures, tutorial studies, and/or library assignments in selected areas of advanced study not available in other courses or as part of the research training.

MICR 692. Current Topics in Molecular Pathogenesis. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open to all graduate and certificate students. Presents a forum for the discussion of recent advances in the study of the molecular mechanisms of microbial pathogenesis. Consists of presentations by students, postdoctoral fellows and faculty followed by interactive discussions of the implications of presented work to the study of molecular pathogenesis.

MICR 694. Current Topics in Immunology. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open to all graduate students. Presents a forum for discussion of the scientific literature in the area of cellular and molecular immunology, focusing on mechanisms involved in the operation and regulation of the vertebrate immune system. Consists of presentations by students and interactive discussions of the implications of presented work to the study of immunology.

MICR 695. Special Topics in Microbiology. 1-4 Hours.
Semester course; 1-4 variable hours. 1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of the research training. Graded as S/U/F.

MICR 697. Directed Research in Microbiology. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S. or Ph.D. degree and elective research projects for other students.