MICROBIOLOGY AND IMMUNOLOGY (MIC)

MIC 100. Microbiology as it Relates to Humans (EXP). 3 Credit Hours.
An introductory microbiology course for the summer scholars program. Microorganisms are in every facet of our lives and make up a microscopic world. Right now, your body is inhabited by over 40 trillion bacteria. Due to the evolution of our immune systems, we have been able to coexist with this world. It is when our immune systems weaken or when our otherwise healthy immune system encounters a particularly nasty pathogen that we become vulnerable. This course will cover the topics of how our immune system works, how microbial pathogens cause disease, how beneficial microbes protect us from disease, and some of the other activities perform that impact our world. The laboratory will provide you with invaluable experience in growing, staining, viewing and identifying microorganisms through the use of practical techniques and procedures. An in lab presentation of your "unknown organism" will culminate what you have learned.
Components: LAB.
Grading: GRD.
Typically Offered: Summer.

MIC 201. Modern Plagues and Society. 3 Credit Hours.
An examination of three infectious diseases (AIDS, tuberculosis, and malaria) that currently impact a significant fraction of the human population, describing the infectious microbes themselves, efforts of researchers to contain these diseases, and how politics, infrastructure, and geographical factors determine public health outcomes.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MIC 280. UMiami Scientifica Magazine - Writer. 0 Credit Hours.
UMiami Scientifica is a premier scientific publication at the University of Miami. The magazine, focuses on the STEM fields and publishes quarterly. Students who write for the magazine will learn to write clearly, concisely and in a manner that can be understood by the layperson. Successfully completing an article does not mean that an article will be published.
Components: THI.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

MIC 301. Introduction to Microbes and the Immune System. 3 Credit Hours.
Basic principles of microbiology and immunology; the microbiology component will include basic properties of bacteria, viruses, and parasites and how microbes interact with multicellular organisms in both disease and non-disease settings. The Immunology component presents the players and basic concepts of immune responses as they apply to combat infectious pathogens, autoimmunity, allergy and transplantation. Course is required for microbiology and immunology majors; recommended for biology, chemistry and biochemistry majors and those considering the health sciences
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MIC 304. Introduction to Microbes and the Immune System (Lab). 2 Credit Hours.
Basic laboratory principles of microbiology and immunology. Students are instructed on how to handle, culture, and identify microorganisms. Microscope care/use, various staining techniques, ELISA, blood typing, bacterial transformation, and more. This laboratory is required of all microbiology and immunology majors.
Corequisite: MIC 301.
Components: LAB.
Grading: GRD.
Typically Offered: Fall & Spring.

MIC 319. Innate Immunity. 3 Credit Hours.
The innate immune system provides the first line of defense against infectious microorganisms and is a very important disease-preventing mechanism. In this course the students will learn the molecular and cellular processes mediating innate immune responses to microbial pathogens, including intra- and extra-cellular bacteria and viruses.
Prerequisite: MIC 301 OR 303 OR 304.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MIC 320. Introduction to Microbes and the Immune System for Nurses. 3 Credit Hours.
Course covers the basic principles of microbiology and immunology. Course cannot be used for MIC major or minor credit.
Requisite: School of Nursing Health Studies.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.
MIC 321. Immunobiology. 3 Credit Hours.
Mechanisms underlying the cooperation between T-cells, B-cells, and antigens leading to humoral and cell mediated responses. The significance of immune cells and their products pertaining to autoimmunity, transplantation, and the surveillance of neoplastic cells is covered.
Prerequisite: MIC 301 or MIC 303.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MIC 322. Medical Parasitology. 3 Credit Hours.
Course discusses the biochemistry, physiology, pathogenicity, immunology, and mechanism of drug action and resistance of medically important parasitic protozoa, trematodes, nematodes, and cestodes.
Prerequisite: MIC 301 or MIC 303.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MIC 323. Microbial Pathogenesis and Physiology. 3 Credit Hours.
Fundamental properties of microbes as well as host-microbe relationships at the molecular and cellular levels.
Prerequisite: MIC 301. Or MIC 303.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MIC 436. Fundamental and Medical Virology. 3 Credit Hours.
The study of viruses as biological entities and etiological agents of disease. Virus-cell and virus-host interactions are also discussed.
Prerequisite: MIC 301 or MIC 303.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MIC 441. Microbiology and Immunology Colloquium. 1 Credit Hour.
External and internal faculty presentations as well as graduate presentations of recent advances in research. Course meets on hour per week.
Prerequisite: MIC 301. Or MIC 303.
Components: SEM.
Grading: GRD.
Typically Offered: Fall & Spring.

MIC 451. Special Projects in Immunobiology. 2-6 Credit Hours.
Wet bench laboratory research with faculty in the Microbiology and Immunology (M&I) Department at the Miller School of Medicine. Students will be actively participating in all aspects of hypothesis-driven scientific research ranging from familiarity with the literature to conducting and analyzing experiments.
Requisite: at least 17 credits in MIC and MIN GPA 3.0.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.

MIC 452. Special Projects in Parasitology. 2-6 Credit Hours.
Wet bench laboratory research with faculty in the Microbiology and Immunology (M&I) Department at the Miller School of Medicine. Students will be actively participating in all aspects of hypothesis-driven scientific research ranging from familiarity with the literature to conducting and analyzing experiments.
Requisite: at least 17 credits in MIC and MIN GPA 3.0.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.

MIC 453. Special Projects in Pathogenic Bacteriology. 2-6 Credit Hours.
Wet bench laboratory research with faculty in the Microbiology and Immunology (M&I) Department at the Miller School of Medicine. Students will be actively participating in all aspects of hypothesis-driven scientific research ranging from familiarity with the literature to conducting and analyzing experiments.
Requisite: at least 17 credits in MIC and MIN GPA 3.0.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.
MIC 454. Special Projects in Microbial Genetics. 2-6 Credit Hours.
Wet bench laboratory research with faculty in the Microbiology and Immunology (M&I) Department at the Miller School of Medicine. Students will be actively participating in all aspects of hypothesis-driven scientific research ranging from familiarity with the literature to conducting and analyzing experiments.
Requisite: at least 17 credits in MIC and MIN GPA 3.0.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.

MIC 455. Special Projects in Immunogenetics. 2-6 Credit Hours.
Wet bench laboratory research with faculty in the Microbiology and Immunology (M&I) Department at the Miller School of Medicine. Students will be actively participating in all aspects of hypothesis-driven scientific research ranging from familiarity with the literature to conducting and analyzing experiments.
Requisite: at least 17 credits in MIC and MIN GPA 3.0.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.

MIC 456. Special Projects in Virology. 2-6 Credit Hours.
Wet bench laboratory research with faculty in the Microbiology and Immunology (M&I) Department at the Miller School of Medicine. Students will be actively participating in all aspects of hypothesis-driven scientific research ranging from familiarity with the literature to conducting and analyzing experiments.
Requisite: at least 17 credits in MIC and MIN GPA 3.0.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.

MIC 460. Advanced Topics in Microbiology and Immunology. 3 Credit Hours.
An extensive and detailed examination of a number of topics covered in the core courses of the major. The goal is for upper-division undergraduate students to take the knowledge base they acquired in their major core courses into ‘cutting edge’ research areas. Each topic (of a total of 4 to 8) will be presented by a Faculty member with expertise in the area. Topics may include HIV Infection and the Immune System, immunology of Pregnancy, and Mitochondrial-based diseases. Emphasis will be placed on gaining a familiarity with the primary scientific: literature.
Requisite: MIC 301 OR MIC 303 OR MIC 304 AND MIC 319 AND MIC 321.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MIC 601. Medical Microbiology. 5 Credit Hours.
Course discusses the nature of microbial agents of infectious disease as well as relationship of virulence to host resistance and fundamental immunologic concepts. Microbial physiology and genetics, the structure, design, and mechanism of action on antimicrobials.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MIC 623. Mechanisms of Microbial Virulence. 2 Credit Hours.
This course will focus on the mechanisms employed by bacterial and viral pathogens to produce disease in animals and humans. The course is divided into two, three-week modules. The first module will cover bacterial pathogens with an emphasis on the bacteria-host cell interaction. Specific topics will include: bacterial attachment and invasion of eukaryotic cells, virulence gene regulation, secretion of virulence factors, bacterial toxins and obligate intracellular bacterial pathogens. The second module will cover viruses and human viral diseases with an emphasis on viral replication, gene expression, virus-host cell interactions and viral oncology. Classes will consist of a mixture of lectures and discussions of recent or classic papers. There will be two exams.
Prerequisites: MIC 775 and MIC 755.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MIC 705. Faculty Research and Discussions. 1 Credit Hour.
Forum for the discussion of the current research projects and interests of the faculty. This course provides students with the opportunity to exchange ideas about important scientific questions and the technologies being applied to experimentally address the hypotheses being tested.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.
MIC 711. Accelerated Basic Science Medical Curriculum. 1-18 Credit Hours.
Beginning in the latter part of June each year, extending to the middle of February of the ensuing year, the following accelerated and intensive complete basic science medical curriculum is offered: Embryology, Gross Anatomy, Histology, Biochemistry, Neuroanatomy, Biophysics and Neurophysiology, Systemic Physiology, Pathology, Medical Microbiology, and Pharmacology. Single grade will be entered on the graduate transcript for this course.

Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

MIC 716. Advanced Molecular Biology. 3 Credit Hours.
The molecular basis of cellular function and regulation in both procaryotic and eucaryotic systems. The molecular genetics and biochemistry of the genetic material and its utilization during replication, transcription, translation, cellular growth, division, and differentiation. Recombinant DNA technology and molecular genetics are discussed. This course is designed for graduate students in biological sciences. A good background in biology or biochemistry is recommended.

Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MIC 726. Laboratory Experimentation. 4 Credit Hours.
One or two laboratory training sessions of 6-12 weeks each. Each student rotates through faculty research laboratories in the areas of immunology, molecular biology, and microbiology, (bacteriology, virology, parasitology) where they receive "hands on" experience by participating in ongoing research projects.

Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MIC 727. Laboratory Experimentation. 6 Credit Hours.
Two or three laboratory training sessions of 6-12 weeks each. Each student rotates through faculty research laboratories in the areas of immunology, molecular biology and microbiology, (bacteriology, virology, parasitology) where they receive "hands on" experience by participating in ongoing research projects.

Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MIC 728. Principles of Immunology. 3 Credit Hours.
This team-taught course will present immunological concepts and reasoning in immunological research. The course is divided into 7 weekly modules. Each module has a common theme and consists of 3 lectures on immunological concepts and one session where students present and discuss a research paper related to the theme of each module. The paper discussion session will include use of disease models as a portal to understand the function of immune system in health and disease. The module topics are (a) lymphoid cell development, (b) antigen recognition, (c) initiation of immune responses, (4) T lymphocyte effector development and function, (5) T cell immunity versus tolerance, (6) B cell immunity, and (7) innate immunity. There will be one exam following the first 4 modules and the second exam after the remaining 3 modules.

Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MIC 731. Special Work. 1-5 Credit Hours.
Special work, lecture, laboratory or a combination of these, as determined by advisor in accord with student's individual interest. Course is offered only on demand.

Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MIC 751. Advance Topics in Microbiology and Virology. 3.00 Credit Hours.
This course is intended to explore, at an advanced level, the dynamic equilibrium that exists between microbial pathogens and host immune systems with emphasis on factors that influence progression to disease or sterilizing immunity. Mechanisms employed by the host and pathogen to shift that equilibrium in their favor will be discussed taking into account interactions at systems, cellular and sub-cellular levels.

Components: LEC.
Grading: GRD.
Typically Offered: Spring.
This is a longitudinal training course delivered throughout all the years. Students start taking it when entering the program upon choice of Lab and mentor. Full credit will be given at time of PhD defense depending on attendance and participation to all modules. This include writing assignments and attendance/participation in seminars, journal clubs, research forums, and classes when applicable.

Components: MOD.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.

MIC 761. Advanced Topics in Molecular Biology of Animal Viruses. 2 Credit Hours.
This course is organized around four major themes of virological studies: (i) viral genome transcription, replication, and virus assembly; (ii) viral pathogenesis; (iii) virus cell interactions; and (iv) antiviral strategies. Most recent research developments in these areas are covered through lectures by participating faculty members as well as paper presentations by students.

Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MIC 775. Advanced Microbiology and Immunology. 3 Credit Hours.
This course will explore in depth the current and advanced concepts and topics in selected areas of Microbiology and Immunology. The classes will consist of a mixture of lectures and discussions of recent papers. Besides covering recent advances and cutting edge experimental approaches in cellular and molecular immunology and microbiology, this course will also expose students to breakthrough concepts and themes that link the disciplines of immunology, microbiology and virology.

Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MIC 780. Research Ethics. 1 Credit Hour.
The NIH Guide for Grants and Contracts stipulates that Institutions receiving support for National Research Service Award Training Grants are required to develop a program in the principles of Scientific Integrity. This program should be an integral part of the proposed training effort. The University of Miami School of Medicine has chosen to respond to this requirement with this course. This course must be taken during the first semester in the Department or Program. This is a six-hour course and is given in two sessions of three hours each.

Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MIC 799. Advanced Topics. 1-3 Credit Hours.
Subject matter offerings based upon student demand and availability of faculty. Subtitles describing the topics to be offered will be shown in parentheses in the printed class schedule, following the title "Advanced Topics".

Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MIC 810. Master's Thesis. 1-6 Credit Hours.
The student working on his/her master's thesis enrolls for credit, in most departments not to exceed six, as determined by his/her advisor. Credit is not awarded until the thesis has been accepted.

Components: THI.
Grading: SUS.
Typically Offered: Offered by Announcement Only.

MIC 820. Research in Residence. 1 Credit Hour.
Used to establish research in residence for the thesis for the master's degree after the student has enrolled for the permissible cumulative total in MIC 710 (usually six credits). Credit not granted. May be regarded as full time residence.

Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MIC 830. Doctoral Dissertation. 1-12 Credit Hours.
Required of all candidates for the Ph.D. The student will enroll for credit as determined by his/her advisor but not for less than a total of 24. Not more than 12 hours of MIC 730 may be taken in a regular semester, nor more than six in a summer session. Where a student has passed his/her (a) qualifying examinations, and (b) is engaged in an assistantship, he/she may still take the maximum allowable credit stated above.

Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.
MIC 840. Doctoral Dissertation - Post Candidacy. 1-12 Credit Hours.
Required for all PhD candidates. The student will enroll for credits as determined by their advisor/Office of Graduate and Postdoctoral Studies but not less than a total of 24. No more than 12 hours of research may be taken in a regular semester, and no more than six in a summer session.
Components: THI.
Grading: SUS.
Typically Offered: Fall.

MIC 850. Research in Residence. 1 Credit Hour.
Used to establish research in residence for the Ph.D., after the student has been enrolled for the permissible cumulative total in appropriate doctoral research. Credit not granted. May be regarded as full-time residence as determined by the Dean of the Graduate School.
Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.