MIC 600. The Microbiome in Health and Immunity. 3 Hours.
This course will introduce the basic concepts of the immune system, including an understanding of the innate and adaptive arms of the immune response and the cells and organs involved. The course will also introduce the role of the microbiome and nutrition in health and disease. This course is designed to facilitate learning through the reading of primary literature sources, use of appropriate educational and medical databases, writing assignments, and discussion-based activities.
Prerequisites: BY 123 [Min Grade: C] and BY 124 [Min Grade: C] and MIC 275 [Min Grade: C]

MIC 601. Foundations in Immunology: The Innate Immune System. 3 Hours.
This course will introduce the cells, receptors, signaling pathways and soluble mediators associated with the innate immune response. The basic components of the innate immune system will then be discussed in the context of their role in the physical, physiological, phagocytic and inflammatory barriers that comprise the innate immune system. Importantly, emphasis will be placed on the molecular and cellular mechanisms that are used by the innate immune system to detect and respond to microbial pathogens to provide the first line of defense.
Prerequisites: BY 210 [Min Grade: C] and MIC 275 [Min Grade: C] or BY 440 [Min Grade: C] and BY 271 [Min Grade: C] (Can be taken Concurrently)

MIC 602. Foundations in Immunology: The Adaptive Immune System. 3 Hours.
This course will provide an in-depth analysis of the cells (T, B and antigen presenting cells), tissues (primary and secondary) and soluble factors (cytokines and chemokines) that comprise the adaptive humoral immune response. The course will examine how cells of the adaptive immune system discriminate self from non-self, including the nature of antigen receptors, the types of antigens recognized and the signals involved in the generation of effector cells that mediate the response.
Prerequisites: BY 210 [Min Grade: C] and MIC 275 [Min Grade: C] or BY 440 [Min Grade: C] and BY 271 [Min Grade: C] (Can be taken Concurrently)

MIC 603. Foundations in Immunology: Microbial Pathogen-Immune System Interaction. 3 Hours.
This course will provide an overview of major concepts related to virulence mechanisms utilized by microbial pathogens and their effect on the host immune response. Emphasis will be placed on important virulence factors/mechanisms associated with bacterial, viral and fungal pathogens and how these alter various components of the innate and adaptive immune responses to allow escape of the pathogen and its survival. This course will introduce the concept of emerging infectious diseases and how their spread is related to their ability to escape detection by the immune system.
Prerequisites: MIC 401 [Min Grade: C] and MIC 402 [Min Grade: C]

MIC 604. Foundations in Immunology: Immunologically-Mediated Diseases. 3 Hours.
This course will focus on the role of the immune system, including the molecular and cellular processes, that contribute to morbidity and mortality associated with immunodeficiency (congenital and acquired), asthma/allergy, autoimmunity (systemic and organ-specific), transplantation and inflammatory syndromes associated with heart disease, cancer, chronic neurological disease and diabetes.
Prerequisites: MIC 401 [Min Grade: C] and MIC 402 [Min Grade: C]

MIC 605. Current Topics in Immunology. 3 Hours.
The current topics courses will in general cover current topics related to immunology, host defense, and immune-based therapeutics. This specific course will examine the factors influencing the disease course of COVID-19 and current treatment and prevention options with an emphasis on discussing the appropriate immune response that leads to mild symptoms and clearance of SARS-CoV-2 and the immune dysregulation that contributes to severe COVID-19. Topics in viral infection with an emphasis on coronaviruses and the concept of spillover will be discussed. Additionally, anti-viral responses of the innate and adaptive immune responses, concepts in immune regulation, and their application in developing vaccines and therapeutics to prevent and treat COVID-19 will be covered.