

CLS Core Course Descriptions

- **BCH3023C BIOCHEMISTRY 4 credits**
This course surveys the fundamental components of biochemistry. In this course, students will learn concepts such as the structure and function of amino acids, proteins, carbohydrates, lipids, and nucleic acids, together with discussions of oxidative metabolism and regulation. The lab component is designed to introduce the student to common techniques in biochemistry and biotechnology. Pre-requisite: CHM 2210/L
- **HSC 3555C PATHOPHYSIOLOGY 3 credits**
This course provides an overview of the etiology, pathophysiology, prevention and treatment of the major human diseases. Both infectious and non-infectious diseases of the human body systems will be presented. Pre-requisite: BSC2085 and BSC2085L, BSC2086 and BSC2086L
- **MLS 3308/L HEMATOLOGY 3 credits/1 credit**
Theories of clinical hematology will be presented, including phlebotomy, hematopoiesis, hemoglobinometry, and cell morphology. A detailed account of the hematologic diseases of red blood cells, white blood cells and platelets will be covered, as well as principles of hemostasis and examination of other serous body fluids. Common hematology tests will be performed during laboratory sessions, including blood cell and platelet counts, indices of red blood cells, WBC differentials, phlebotomy, and coagulation tests. Prerequisites: MCB 2010 (or MCB 3020), PCB 4233C
- **MLS 3705 CLINICAL LABORATORY MANAGEMENT 2 credits**
Course emphasis is on quality control and quality assurance programs, laboratory records, equipment and reagent purchasing, laboratory computerization, work-load recording programs, scheduling, personnel handling, and methods of laboratory self-evaluation. Prerequisites: STA 2023 Co-requisite: MLS 4150
- **MLS 4150 CLINICAL CORRELATIONS 2 credit**
This seminar type class is designed to help students correlate laboratory analytes with the organ(s) of origin and with the predominant pathophysiology associated with abnormal results. The students will describe the most common test methodologies used to measure individual analytes and interrelate lab results from different disciplines. Problem based learning and papers will be used to enhance critical thinking skills. Prerequisites: MLS 4308/L, MLS 4625/L, CHM 2211/L Co-Requisite: MLS 4460C, MLS 4550/L, MLS 4705
- **MLS 4191/L MOLECULAR DIAGNOSTICS 2 credits/1 credit**
This course presents the molecular mechanisms of human diseases and focuses on diagnosis through cytogenetic and nucleic acid molecular technology. Laboratories emphasize basic and clinical techniques of DNA-based diagnostic methods. Prerequisites: PCB 3134/L, BSC 2427C, CHM 2211/L

- **MLS 4460C DIAGNOSTIC MICROBIOLOGY 5 credits**
 This course focuses on the collection, handling and processing of specimens from human tissues and body fluids for the identification of pathogenic bacteria. Conventional and rapid microbiological methods for identification of organisms as well as nontraditional methods for identification and detection of organisms or their products will be addressed including principles of automated methods. The laboratory sessions will include techniques and methods for the identification of organisms and antimicrobial susceptibility testing. Prerequisites: MCB 2010 (or MCB 3020), PCB 3134/L, CHM 2211/L
- **MLS 4550/L IMMUNOHEMATOLOGY 2 credits/1 credit**
 Topics covered include the fundamentals of blood banking including blood grouping, compatibility testing, antibody identification, blood group systems, hemolytic disease of the newborn, transfusion therapy and blood components. Laboratory sessions include the performance of routine operations of clinical blood bank laboratories, daily quality control procedures, routine testing procedures for ABO and Rh typing, identification of antibodies to antigens other than ABO and Rh, and direct and indirect antiglobulin test. Prerequisites: PCB 4233/L, MLS 3308/L CHM 2211/L
- **MLS 4625/L CLINICAL CHEMISTRY 3 credits/1 credit**
 This course addresses renal, liver and gastrointestinal physiology and includes an in-depth study of chemical methods used in the analysis of carbohydrates, proteins, lipids enzymes, hormones and electrolytes. Patient lab profiles including evaluating renal and liver function will be discussed and related to pathophysiology. Instrumentation including automation will be addressed. Laboratory will cover blood glucose, electrolyte, lipid, enzyme, and protein methods and will include advanced concepts in troubleshooting. Prerequisites: HSC 3555C, BCH 3023C
 Co-requisite: CHM2211/L
- **MLS 4820L CLINICAL CHEMISTRY INTERNSHIP 4 credits**
 Practical experience performed in a clinical chemistry laboratory with emphasis on chemistry instrumentation, electrophoresis, therapeutic drug monitoring, and toxicology. Emphasis for course includes performance of diagnostic procedures and application of knowledge from previous coursework with emphasis on clinical correlations to human diseases. Prerequisites: MLS4308/L, MLS4460C, MLS4550/L, MLS 4625/L
- **MLS 4821L MICROBIOLOGY INTERNSHIP 4 credits**
 Practical experience performed in a clinical microbiology laboratory with emphasis on sample setup, instrumentation, aerobic and anaerobic cultures from various sites and their interpretation, and includes the subject areas of mycology, mycobacteriology, and parasitology. Prerequisites: MLS4308/L, MLS4460C, MLS4550/L, MLS 4625/L
- **MLS 4822L HEMATOLOGY INTERNSHIP 4 credits**
 Practical experience performed in a clinical hematology/ hemostasis laboratory. Emphasis for course includes performance of diagnostic procedures and application of knowledge from previous coursework with emphasis on clinical correlations to hematological diseases. Prerequisites: MLS4308/L, MLS4460C, MLS4550/L, MLS 4625/L
- **MLS 4823L IMMUNOHEMATOLOGY INTERNSHIP 3 credits**
 Practical training in modern blood banking and transfusion services at the hospital and area blood banks. Training includes practice and performance, under supervision, of all the procedures involving pre-transfusion tests on patient's blood, selection of donor blood,

compatibility determination, problem solving, and release of suitable blood/blood components for transfusion therapy. Prerequisites: MLS4308/L, MLS4460C, MLS4550/L, MLS 4625/L

▪ **MLS 4824L SEROLOGY INTERNSHIP 3 credits**

Practical experience performed in a clinical serology laboratory. Emphasis is placed on special methods in clinical chemistry, microbiology and other areas which includes non-routine (special) immunochemical procedures, methods in immunodiagnostics, and virology. Prerequisites: MLS4308/L, MLS4460C, MLS4550/L, MLS 4625/L

▪ **PCB 3134/L MOLECULAR BIOLOGY 3 credits/1 credit**

This class concentrates on cellular chemistry and physiology, morphology and function of cellular organelles, cellular motility, growth, division, and endocrine and exocrine communication. Emphasis is placed on interrelation of structure and function and regulation of metabolism. Specialized activities of animal cells will be highlighted, including concepts relating genetics to regulatory mechanisms and abnormal cell physiology will be introduced. Laboratory sessions will include applications of molecular biology with emphasis on advanced techniques in biotechnology, research methods and data interpretation. Prerequisites: BSC 2010/L, BSC2426C CHM 2210/L

▪ **PCB 4233C IMMUNOLOGY 3 credits**

Basic principles of immunology, including humoral and cell-mediated immune mechanisms, the complement system and the inflammatory response are presented in this course. Disorders of the immune system and laboratory methods will also be topics for discussion. Lab sessions will address experiments with an immunological basis, such as the methodology and performance of home pregnancy and home drug tests, biotechnology methods related to immunology, immunostaining, ELISA tests, antibody production and other related concepts. Prerequisites: MCB 2010 or MCB 3020, BSC 2085/L, BSC 2086/L