MLS—MEDICAL LABORATORY SCIENCE

BOUVÉ COLLEGE OF HEALTH SCIENCES

MLS U101 MLS Orientation 1 SH
Introduces students to the health-care delivery system and the profession of medical laboratory science. Topics include a brief history of the development of medicine and the profession of medical technology, medical terminology, foundations of quality assurance and quality control, and career cooperative education preparation skills. Develops an understanding of cooperative education learning objectives. Covers how to prepare résumés, improve interviewing skills, and develop strategies to solve work-related challenges on the job. Modes of instruction include case studies, group exercises, role-play, oral presentations, and written assignments.

MLS U102 Phlebotomy Essentials 3 SH
Emphasizes the role of the phlebotomist as part of the health-care team. Gives instruction covering the important steps to follow when obtaining a blood sample. Topics include proper patient identification, patient relations, safety and infection control, venipuncture and skin puncture procedures with the equipment and supplies used for both, certification, and quality assurance for phlebotomy programs.

MLS U201 Laboratory Techniques 2 SH
Focuses on the principles and theories of basic technical skills needed to work in a clinical or research laboratory. Lecture topics include laboratory safety and OSHA regulations, basic laboratory calculations and solution preparation, phlebotomy collection techniques, quality control and quality assurance, and method evaluation. Spectral and electrochemical instrumentation, pipetting, and microscopy are included. Coreq. MLS U202. Prereq. CHM U214 or taken concurrently.

MLS U202 Lab for MLS U201 1 SH
Accompanies MLS U201. Introduces students to essential techniques needed for working in a clinical or research laboratory. Laboratory activities incorporate issues of laboratory safety, aseptic technique and OSHA regulations, and quality assurance and quality control while teaching solution preparation, spectral and electrochemical instrumentation, pipetting, microscopy, and blood collection procedures. Coreq. MLS U201. Prereq. CHM U214 or taken concurrently.

MLS U299 Foundations of Forensic Lab Science 3 SH
Introduces students to the basis for genetic and chemical analysis of forensic evidence. Discusses scientific information that forms the basis for DNA testing and the identification of drugs of abuse. Provides students with an understanding of how these specific scientific technologies are used in forensic investigations, how the evidence is collected, and how the scientific results are used in court to provide information to those who are charged with determining guilt or innocence. Instructional formats include lecture, discussion, question and answer sessions, and reading assignments. Specific case studies are used as illustrations.

MLS U301 Fundamentals of Core Lab Techniques 3 SH
Discusses principles, procedures, and clinical significance of basic hematology procedures, normal cell morphology, urinalysis, serology, body fluids, selected clinical chemistry analyses, and point-of-care testing. An emphasis is placed on both manual and automated methods including quality control, sources of error, data analysis, and results correlation. Coreq. MLS U302. Prereq. MLS U201, MLS U202, BIO U111, and CHM U211 or permission of instructor.

MLS U302 Lab for MLS U301 2 SH
Accompanies MLS U301. Acquaints students with laboratory safety and specimen handling. Laboratory exercises introduce students to the procedures of basic medical laboratory assays including hematology, urinalysis, serology, body fluid analysis, selected clinical chemistry analyses, and point-of-care testing. An emphasis is placed on both manual and automated methods including quality control, sources of error, data analysis, and results correlation. Coreq. MLS U301. Prereq. MLS U201, BIO U111, and CHM U211 or permission of instructor.

MLS U315 Medical Immunology 3 SH
Explores the principles of basic immunology. Topics include innate and acquired immunity, organs and cells of the immune system, antigens and antibodies, and soluble mediators. Also discusses the immune response in infectious diseases and hypersensitivity reactions. Selected classic case studies are presented to demonstrate the role of immunologic and serologic laboratory testing in the diagnosis and treatment of disease. Prereq. MLS U301 and MLS U302 or permission of instructor.

MLS U315 Medical Microbiology 1 4 SH
Introduces the principles and techniques of organism isolation, cultivation, and identification from clinical specimens. Discusses identifying bacteria, yeast, and fungi that are pathogenic for humans according to the isolated organism’s clinical specimen. Emphasizes how to collect and transport specimens, what laboratory protocols to use in diagnosis, and procedures for identifying organisms. Coreq. MLS U506. Prereq. MLS U315.
MLS U506 Lab for MLS U505 1 SH
Accompanies MLS U505. Practices techniques of organism isolation, cultivation, and identification from clinical specimens. Practices identifying bacteria, yeast, and fungi that are pathogenic for humans according to the isolated organism's clinical specimen. Emphasizes laboratory protocols to use in diagnosis, and procedures for identifying organisms. Focuses on developing skill in the aseptic processing of cultures for various human pathogenic bacteria, yeast, and fungi. An emphasis is placed on traditional methodologies with an introduction to system approaches and automated procedures. Coreq. MLS U505. Prereq. MLS U315.

MLS U520 Fundamentals of Hematology 4 SH
Emphasizes hematopoiesis, maturational characteristics of hematologic cells, and abnormal morphology of erythrocytes, leukocytes, and thrombocytes. The principles of hemostasis and thrombosis are included. Case studies are discussed in each topical category. Coreq. MLS U521. Prereq. MLS U301 and MLS U302 or permission of instructor.

MLS U521 Lab for MLS U520 1 SH
Accompanies MLS U520. Stresses maturation and abnormal morphology of erythrocytes, granulocytes, and thrombocytes. Case studies related to specific smears are discussed. Basic coagulation instrumentation is included. Coreq. MLS U520. Prereq. MLS U301 and MLS U302 or permission of instructor.

MLS U530 Clinical Chemistry 4 SH
Covers the principles of clinical chemistry with an emphasis on the clinical significance and pathophysiology of related disease states, and common methods of quantitating selected important analyses. Discusses acquisition, management, and application of laboratory data. Coreq. MLS U531. Prereq. MLS U301 and MLS U302.

MLS U531 Lab for MLS U530 1 SH

MLS U541 Virology 2 SH
Introduces clinical virology with the focus on the approach used in a clinical virology laboratory to isolate and identify viruses of pathogenic significance. After a general review of the principles of virology, each class of viruses is discussed as they relate to structure, replication mechanisms, pathogenic mechanisms, identification, and treatment protocols. Prereq. MLS U505, MLS U506, and junior or senior standing.

MLS U542 Medical Microbiology 2 2 SH
Continues MLS U505. Examines host and microbial interactions in disease produced by viruses, rickettsia, chlamydia, mycoplasma, mycobacteria, anaerobic bacteria, and actinomyces. Also covers host and microbial interactions in gastrointestinal, genitourinary, and respiratory tract infections. Discusses disease states, diagnostic procedures, and antimicrobial testing. Also examines parasites and viruses that are pathogenic to man including pathogenesis, relevant clinical symptoms, and diagnostic criteria. The integrated laboratory stresses the isolation and identification techniques of medically important parasites. Coreq. MLS U543. Prereq. MLS U505, MLS U506, and junior or senior standing.

MLS U543 Lab for MLS U542 2 SH
Accompanies MLS U542. Focuses on the principles of immunohematology with specific application to the ABO system, Rh and other blood group systems, antibody detection and identification, cross matching, transfusion reactions, blood components, and hemolytic disease of the newborn. Coreq. MLS U542. Prereq. MLS U505, MLS U506, and junior or senior standing.

MLS U550 Immunohematology 3 SH
Practices ABO grouping and Rh typing, cross matching, antibody identification, and donor screening. Coreq. MLS U551. Prereq. MLS U315 and senior standing or permission of instructor.

MLS U551 Lab for MLS U550 1 SH
Accompanies MLS U550. Integrates the fundamental concepts and processes of normal anatomy and physiology, the relationship of developmental stages and other factors related to dysfunction, and specific disorders traditionally organized by body systems. Discussion and problem-solving techniques are used to analyze, apply, and interpret relevant clinical and laboratory data to selected case studies. Coreq. MLS U550. Prereq. MLS U315 and senior standing or permission of instructor.

MLS U601 Pathophysiology and Clinical Correlation 3 SH
Integrates the fundamental concepts and processes of normal anatomy and physiology, the relationship of developmental stages and other factors related to dysfunction, and specific disorders traditionally organized by body systems. Discussion and problem-solving techniques are used to analyze, apply, and interpret relevant clinical and laboratory data to selected case studies. Prereq. MLS U506, MLS U520, MLS U530, and senior standing or permission of instructor.
MLS U605 Management and Education 3 SH
Focuses on fundamental theories and practices in the fields of management and education. The management portion introduces factors that relate to effective lab administration: hospital organizational structure, principles of management and supervision, financial management, purchasing, governmental regulatory and certification compliance, voluntary accreditation issues, legal responsibilities, and human resource relations. Other topics include the application of computer technology to the management of biological and medical information, and the role of databases and algorithms in clinical medicine information technology. Comprises case studies, group exercises, role-play, oral presentations, and written assignments. The education portion addresses the topics of development of learning objectives, methods of evaluation and certification, clinical instruction and evaluation, use of media, and other methods of instruction. Comprises lectures, discussions, question and answer sessions, and readings. Prereq. Senior standing or permission of instructor.

MLS U606 Lab Management Applications 1 SH

MLS U700 Undergraduate Research 2 SH
Examines special problem in lab medicine involving individual research under the direction of a faculty member. Prereq. Permission of instructor.

MLS U900 Special Topics 2 SH
Covers current topics in the clinical laboratory. Instructional formats include lecture, discussion, question-and-answer sessions, and reading assignments. Prereq. Permission of instructor.

MLS U921 Directed Study 1 SH
MLS U922 Directed Study 2 SH
MLS U923 Directed Study 3 SH
MLS U924 Directed Study 4 SH
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. Prereq. Permission of instructor.

MLS U940 Microbiology Clinical Applied Study 4 SH
Offers clinical practicum in applied microbiology at an affiliated hospital providing MT (ASCP)- and CLS (NCA)-level instruction. Prereq. MT clinical program admission.

MLS U941 Immunology Clinical Applied Study 2 SH
Offers clinical practicum in applied clinical immunology at an affiliated hospital providing MT (ASCP)- and CLA (NCA)-level instruction. Prereq. MT clinical program admission.

MLS U942 Hematology Clinical Applied Study 3 SH
Offers clinical practicum in applied hematology at an affiliated hospital providing MT (ASCP)- and CLS (NCA)-level instruction. Prereq. MT clinical program admission.

MLS U943 Clinical Chemistry Clinical Applied Study 4 SH
Offers clinical practicum in applied clinical chemistry at an affiliated hospital providing MT (ASCP)- and CLA (NCA)-level instruction. Prereq. MT clinical program admission.

MLS U944 Immunohematology Clinical Applied Study 3 SH
Offers clinical practicum in applied immunohematology at an affiliated hospital providing MT (ASCP)- and CLS (NCA)-level instruction. Prereq. MT clinical program admission.

MLS U960 MLS Senior Seminar 2 SH
Reviews current undergraduate medical lab science topics. Instructional formats include lecture, discussion, question-and-answer sessions, and reading assignments. Prereq. Senior standing.

MLS U970 Junior/Senior Honors Project 1 4 SH
Focuses on in-depth project in which a student conducts research or produces a product related to the student’s major field. Culminating experience in the University Honors Program. Combined with Junior/Senior Project 2 or college-defined equivalent for 8-credit honors project. Prereq. Honors program participation.

MLS U971 Junior/Senior Honors Project 2 4 SH
Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student’s major field. Culminating experience in the University Honors Program. Prereq. MLS U970 and honors program participation.