

CLINICAL SCIENCE (CLS)

CLS 301. Intro Clin Lab Proced Lec. (2 Units)

Prerequisite: BIO 122 required. Demonstration and practice of specialized techniques used in the clinical setting. Theory of arterial, capillary and venipuncture including complications. Processing body fluids. Review of state/federal laws, biohazards and quality assurance. Oral and/or written reports/projects.

Offered Fall, Spring

CLS 302. Clinical Practice Lab. (1 Units)

Prerequisites: BIO 122; CLS 301 or concurrent enrollment required.

Practice in clinical laboratory techniques: phlebotomy; serum, plasma and whole blood preparation for testing; Minimum 90 hours training at a clinical affiliate under University Faculty supervision. Written report(s).

Offered Fall, Spring

CLS 303. Radiation Science. (3 Units)

Prerequisites: MAT 171 and HSC 201. Overview of radiation science: history, radiation physics, instrumentation, protection and safety. Applications to clinical procedures utilizing radionuclides. Problem solving.

Offered As needed

CLS 304. Introduction to Urinalysis and Body Fluids. (3 Units)

Prerequisite: BIO 122 and CHE 112 or equivalent is required. An introduction to the analysis of urine and body fluids used in the clinical setting. Discussion of the theory and diagnostic applications relative to the analysis of urine and body fluids. Demonstration of lab techniques with limited lab practice.

Offered Fall, Spring

CLS 305. Rad Biology & Protection. (1 Units)

Prerequisite: Admission to the clinical year. Modes of radioactive decay, photon radiation, interaction of radiation with matter, biologic effects of radiation, decontamination techniques, government regulations. Problem solving. Report writing. Oral and/or written reports/projects.

Offered As needed

CLS 306. Clin Immun & Immunochem. (4 Units)

Prerequisites: BIO 250; CLS 301 or concurrent enrollment required. Theory and practice of serologic techniques; nature of antigens, antibodies and the immune response. Genetics of red cell antigens. Pre-natal, neonatal, and pre transfusion testing. Cause, investigation and prevention of HDNB. Compatibility testing and investigation of transfusion reactions. Case studies. Written reports. Three hours of lecture and three hours of laboratory per week.

Offered Spring

CLS 307. Clinical Hematology. (4 Units)

Prerequisites: BIO 250; CLS 301 or concurrent enrollment required. The goal of this course is to provide the student with the basic theoretical foundation of Clinical Hematology relative to the scope of practice for an entry level Clinical Laboratory Scientist. The student will first focus on normal blood cell development (hematopoiesis), then normal cell function, leading into abnormal function and the pathogenesis of hematological disorders. The course emphasis is on recognition of normal and abnormal laboratory results and interpretation of clinical data used in the diagnostic process. The course is broken down into four main sections: starting with an overview of the clinical hematology laboratory and hematopoiesis; then erythropoiesis and disorders primarily involving red cells; followed by normal leukopoiesis, non-malignant leukocytes, and related disorders; and lastly the study of malignant leukocyte disorders and platelets. Students will describe and analyze the process of Hematopoiesis. Disciplinary writing will be employed to produce case studies, written reports and analyze theory of hematology procedures. Application of course concepts will be used to enumerate and identify blood cells. Emphasis will be placed on the identification and description of detection of abnormalities and on the demonstration of special equipment and techniques. The proposed Student Learning Outcomes (SLO) are as follows. 1. Demonstrate the ability to perform clinical diagnostic testing, evaluate outcomes, and generate a written report in order to solve problems related to pre-analytical, analytical, and post-analytical components of services in the clinical laboratory. 2. Employ health professional discourse and proper medical terminology to facilitate communication on laboratory findings pertaining to hematology. 3. Identify, read, and interpret published studies in clinical hematology in order to describe, evaluate, and report the clinical laboratory findings. 4. Identify and analyze the principles of hematology and generate written reports that address laboratory findings. 5. Communicate effectively about hematology across medical professions, including physician, nursing, and other specializations.

Offered Fall

CLS 308. Pathophys for Hlth Professions. (3 Units)

Prerequisite: BIO 250 and either BIO 251, CHE 112, or equivalent.

Principles of clinical pathophysiology, including assessment of clinical data necessary for identifying the causes of diseases and evaluating the underlying mechanisms of pathologic processes. Discussion of immune disorders, inflammation, neoplasia and genetic disorders. Review of the individual organ system and associated pathology. Case studies, written/ and or oral reports.

Offered All terms, Fall

CLS 401. Overview: Virology/Mycology. (2 Units)

Prerequisites: BIO 324 or concurrent enrollment; CLS 301 is recommended. Brief introduction to special pathogens for students preparing for the clinical virology and mycology rotations in the clinical laboratory.

Offered Spring

CLS 410. Nml: Imaging Techniques. (5-6 Units)

Prerequisite: Admission to the clinical year. Use of nuclear medicine equipment in a clinical setting to visualize organs, determine function of organs and organ systems.

Offered As needed

CLS 411. Nml: Radiopharm/Assay. (4 Units)

Prerequisite: Admission to the clinical year. Preparation of radionuclides for administration in diagnostic testing including radio- chemical purity, quantitative assay and sterility. Radioassay techniques: calibration and use of instruments, specimen collection. Quality assurance.

Offered As needed

CLS 412. Nml: Instru/In Vivo. (4 Units)

Prerequisite: Admission to the clinical year. Performance of procedures utilizing radionuclides for in-vivo studies. Instrument calibration, preventive maintenance. Computer applications.
Offered As needed

CLS 413. Nml: Special Studies. (2 Units)

Prerequisite: Admission to the clinical year. Practicum in special studies of interest related to nuclear medicine. Project and written report.
Repeatable course.
Offered As needed

CLS 420. Cnm: Imaging Techniques. (3 Units)

Prerequisite: Admission to the clinical year. Principles of stationary and moving imaging with correlations to pathophysiology in human organs and systems.
Offered As needed

CLS 421. Cnm: Radiopharm/Assay. (2 Units)

Prerequisite: Admission to the clinical year. Theory of radiopharmaceutical applications: radionuclides, dose calibration. Principles of saturation analysis and competitive protein binding, correlations of biochemistry, pathophysiology, radioassay techniques, principles and applications to individual techniques. Quality assurance.
Offered As needed

CLS 422. Cnm: Instru/In Vivo Tech. (2 Units)

Prerequisite: Admission to the clinical year. Instrumentation including Geiger-Mueller tubes, rectilinear scanners, scintillation spectrometers and gamma cameras. In-vivo techniques including Schilling test, blood volume, time dependent studies, erythrokinetics, gastrointestinal loss studies.
Offered As needed

CLS 423. Cnm: Special Studies. (1 Units)

Prerequisite: Admission to the clinical year. Special studies including ultrasound, radiotherapy and nuclear magnetic resonance. Repeatable course.
Offered As needed

CLS 430. Clin Micro Lab. (3-4 Units)

Prerequisite: Admission to the clinical year. Techniques and practice in medical microbiology including parasitology, mycology, and bacteriology at a clinical affiliate. Oral and/or written reports/projects.
Offered Fall

CLS 431. Clin Chemistry Lab. (3-4 Units)

Prerequisite: Admission to the clinical year. Techniques and practice in chemistry at a clinical affiliate. Oral and/or written reports/projects.
Offered Fall

CLS 432. Clin Hem/Urinalysis Lab. (4 Units)

Prerequisite: Admission to the clinical year. Techniques and practice in hematology and urinalysis at a clinical affiliate. Oral and/or written reports/projects.
Offered Spring

CLS 433. Clin Immunochem/Sero Lab. (3 Units)

Prerequisite: Admission to the clinical year. Techniques and practice in serology, immunology and blood banking at a clinical affiliate. Oral and/or written reports/projects.
Offered Spring

CLS 434. Clin Special Proc Lab. (1 Units)

Prerequisite: Admission to the clinical year. Techniques and practice in special procedures at a clinical affiliate. Oral and/or written reports/projects. Repeatable course.
Offered Spring

CLS 440. Correl Clin Micro. (2 Units)

Prerequisite: Admission to the clinical year. Theory and correlations of pathophysiology in medical microbiology including mycology, parasitology and bacteriology.
Offered Spring

CLS 441. Correl Clin Chem. (2 Units)

Prerequisite: Admission to the clinical year. Theory and practical aspects correlating clinical chemistry with pathophysiology.
Offered Spring

CLS 442. Correl Clin Hem-Urinalysis. (2 Units)

Prerequisite: Admission to the clinical year. Theory and practical applications correlating hematology and urinalysis to pathophysiology.
Offered Fall

CLS 443. Correl Clin Immunochem-Sero. (2 Units)

Prerequisite: Admission to the clinical year. Theory and practical applications correlating serology, immunology and blood banking to pathophysiology.
Offered Fall

CLS 450. Micro: Fem Genit Tract. (4 Units)

Prerequisite: Admission to the clinical year in cytotechnology. Microscopic examination of cytologic and histologic material of benign and malignant disease processes from the female genital tract, including microbiology, hormonal effects and response to therapy.
Offered Fall

CLS 451. Micro: Resp & Gi Tract. (2 Units)

Prerequisite: Admission to the clinical year in cytotechnology. Microscopic examination of cytologic and histologic material of benign and malignant disease processes from the respiratory and gastrointestinal tracts.
Offered Fall

CLS 452. Micro: Gu Tract/Body Cav Fluid. (2 Units)

Prerequisite: Admission to the clinical year in cytotechnology. Microscopic examination of cytologic and histologic material of benign and malignant disease processes of the genitourinary system and body cavity fluids.
Offered Fall

CLS 453. Micro: Fine Needle Aspir. (2 Units)

Prerequisite: Admission to the clinical year in cytotechnology. Microscopic examination of cytologic and histologic material of benign and malignant disease processes in aspirated material.
Offered Spring

CLS 454. Micro: Systems Overview. (4 Units)

Prerequisite: Admission to the clinical year in cytotechnology. Cytologic examination of gynecologic and non-gynecologic material from all body sites for diagnostic purposes.
Offered Spring

CLS 455. Cytologic Preparation. (2 Units)

Prerequisite: Admission to the clinical year in cytotechnology. Current methods of processing and staining material for cytologic study. Techniques utilized in obtaining non-gynecologic material for cytologic evaluation.
Offered Spring

CLS 460. General Cytology. (3 Units)

Prerequisite: Admission to the clinical year in cytotechnology. General cytology, cytogenetics, and electron microscopy. Basic principles of pathology and cytology as they apply to malignancy. Anatomy, histology, pathology and cytopathology of the female genital tract, including microbiology, hormonal effects and response to therapy.

Offered Fall

CLS 461. Cyto Res & Gi Tract. (2 Units)

Prerequisite: Admission to the clinical year in cytotechnology. Normal and abnormal cytology of the respiratory and gastrointestinal tracts with emphasis on anatomical and histological pathology.

Offered Spring

CLS 462. Cyto Gu Body C Fluids. (2 Units)

Prerequisite: Admission to the clinical year in cytotechnology. Normal and abnormal cytology of the genitourinary system and body cavity fluids with emphasis on anatomical and histological pathology.

Offered Spring

CLS 463. Fine Needle Aspirat Cytol. (1 Units)

Prerequisite: Admission to the clinical year in cytotechnology. Normal and abnormal aspiration cytology of the major organs with emphasis on anatomical and histological pathologies.

Offered Spring

CLS 490. Seminar In Clinical Sciences. (1 Units)

Prerequisites: CLS 301 and CLS 306 required; and all lower division Clinical Science Program required. Presentation and discussion of pertinent topics from clinical science trade journals. Written and oral presentations. One hour of seminar per week.

Offered As needed

CLS 491. Management Skills in Clinical Sciences. (3 Units)

Prerequisites: Admission to Clinical Internship; CLS 301 is recommended. Discussion of current and emerging theories, concepts and trends relevant to the management of clinical laboratories, including compliance, professional development, training and educational methodologies. Student projects, written and oral reports are required.

Offered All terms, Spring

CLS 492. Research Methods in Clinical Science. (3 Units)

Prerequisite: Admission to Clinical Internship; MAT 131 is recommended. Overview of relevant theoretical concepts, methods and applications utilized in clinical science research. Application of research methods to the development and design of research proposal. Critical analysis of literature review, data, and published research studies in clinical sciences.

Offered All terms, Fall

CLS 494. Independent Study in Clinical Science. (1-3 Units)

Course of study designed cooperatively by student and instructor to accomplish individualized learning objectives that are appropriate to the clinical laboratory. Consent of instructor required. CR/NC grading.

Offered Fall, Spring

CLS 501. Clinical Sciences: Team Concept. (3 Units)

Prerequisite: HEA 201. Analysis of the current status and problems in health care delivery including management, staffing and health economics; development of a realistic model. Role of allied health professionals in health care delivery; scientific medicine vs. holistic health; prevention and health education. Coordination of the clinical sciences into an effective health care team. To successfully complete this class, students must demonstrate proficiency to the satisfaction of the instructor in oral and written communication skills in the English language. Oral and/or written reports/projects.

Offered As needed

CLS 502. Management Concepts in the Clinical Sciences. (3 Units)

Prerequisite: HEA 201. Managerial function, organization, and structure. A pragmatic approach to the strategies and tactics available to the professional manager. Special projects in work sampling, workload recording and time management for health care professionals. Oral and/or written reports/projects.

Offered As needed

CLS 503. Clinical Diagnosis. (3 Units)

By use of case studies, interpretation of clinical data, correlation of history and physical to diagnosis, treatment and follow-up protocols. Student case study investigation. Two hours of lecture and two hours of activity per week.

Offered As needed

CLS 504. Data Collect & Process. (3 Units)

Prerequisite: CSC 111 or equivalent. Collection, storage and retrieval of data, with emphasis on clinical applications. Modern information systems and evaluation of such systems from the clinical science management view point. Oral and/or written reports/projects. Two hours of lecture and two hours of activity per week.

Offered As needed

CLS 505. Stat Analysis & Research. (3 Units)

Prerequisite: MAT 131. Application of statistical analysis in the clinical and health sciences, including normal and binomial distribution, t-tests, chi square tests, analysis of variance, linear regression and correlation. Student project required. Two hours of lecture and two hours of activity per week.

Offered As needed

CLS 590. Graduate Seminar. (1-2 Units)

Prerequisites: CLS 501, CLS 502 and CLS 503 or consent of instructor. Seminar methods and use of the literature in the clinical sciences. Faculty and student directed discussions of contemporary clinical science issues. Participants present and interpret recent publications. Written abstracts. Repeatable up to 6 units. One hour of seminar per week.

Offered As needed

CLS 594. Ind Study In Clin Sci. (1-3 Units)

Prerequisite: Consent of instructor and advisor. Independent and original laboratory or field investigation under supervision of a faculty member.

Offered As needed

CLS 595. Special Top.: (1-3 Units)

Prerequisite: Health Care Practitioner. Advanced topics of special interest to Clinical Science majors possessing health care credentials. Topic and content will vary as announced.

Offered As needed

CLS 596. Internship. (1-6 Units)

Prerequisite: Graduate standing; CLS 501 and 502 recommended. Students will be directed to health care facilities to serve as interns within their chosen specialization. Teaching opportunities may be available in a variety of settings. Regular meetings are scheduled with a faculty internship supervisor to assess student progress. Written report required. Course designed for graduate students in the Clinical Sciences. Repeatable course.

Offered As needed

CLS 599. Grad Capstone Activity. (1-3 Units)

Prerequisites: Graduate Writing Assessment Requirement; advancement to candidacy, and completion of all required core courses. Department approval of advisor and project. Students will choose either a thesis, project or comprehensive examination in consultation with their advisor. Offered As needed

CLS 600. Grad Continuation Course. (1 Units)

Graduate students who have completed course work but not their thesis, project, or comprehensive examination, or who have other requirements remaining for completion of their degree, may maintain continuous attendance by enrolling in this course. Signature of graduate program coordinator required. Offered Fall, Spring