

COURSE DESCRIPTIONS

CLINICAL LABORATORY SCIENCE MAJOR

HISTOTECHNOLOGY OPTION

Chemistry 105 - Fundamental Chemistry (5 cr) - (Two semester basic course) Fundamental principles and theories of chemistry, including stoichiometry, atomic and molecular structure and bonding, nuclear chemistry, thermodynamics, descriptive chemistry of nonmetals and transition metals, chemical kinetics and equilibria, introduction to organic chemistry. 3 hrs lec, 1 hr disc, 3 hrs lab per wk. Prereq: Math 90 or placement in 100 or above.

Chemistry 106 - Fundamental Chemistry (5 cr) - Continuation of 105. 3 hrs lec, 1 hr disc, 3 hrs lab per wk. Prereq: 105, Math 100 or higher.

Biology 160 - Introduction to Animal Biology (5 cr) - Anatomy, physiology, adaptation, and classification of animals; morphology and anatomy of various types of animals. Three hours lecture, three hours lab per week. Additional two-hour test sections four times during the semester.

Biology 210 - Principles of Genetics (3 cr) - General principles of heredity and variation of plants and animals, including humans. Prereq: Sophomore standing.

Biology 285 - Human Physiology (4 cr) - Normal functions of organ systems in humans; fulfills the physiology requirements for biology, human development and nutritional sciences, physical education majors, and is recommended for students with preprofessional interests in medical or allied health fields. Three hours lecture, three hours lab per week. Prereq: 160; or 101 and Chemistry 101.

Biology 314 - Cell Biology (4 cr.) - Structure and function of cells and organelles, including membrane structure and transport; biogenetics of mitochondria and chloroplasts; cell motility; DNA replication; protein synthesis and transport; mitosis; meiosis; cytokinesis; laboratory techniques including gel electrophoresis; phase-contrast microscopy; spectrophotometry; respirometry; radioisotope analysis; cell culture; chromosome banding; bacterial DNA transformation. 3 hrs lec, 3 hrs lab per wk. Prereq: 130, 160; Chemistry 106 or 116.

Biology 326 - Electron Microscope Techniques (3 cr) - Fixing, embedding, microtomy, and staining biological tissues for transmission and scanning electron microscopy; electron microscope use and basic photographic darkroom techniques. 1 hr lec, 6 hrs lab per wk. Prereq: 130, 160, Chemistry 106 or 116; and cons instr.

Biology 333 - General Microbiology (4 cr) - Morphology, physiology classification, and cultivation of bacteria and viruses, with introduction to microbial genetics, pathogenesis, and immunology. Two hours lecture, four hours lab per week. Prereq: 101, 130, or 160; and Chemistry 106 or 116.

Biology 387 - Human Anatomy (4 cr) – Human Anatomy is examined using models, X-rays, charts, computer animations, and prosected cadaver demonstrations. Complements Biol. 285 to provide a general background in human structure and function. For students preparing for health care careers. Three hrs. lecture, three hrs. lab per week. Prereq.: 281 or 285 or con reg 281 or 285.

Mathematics 100 - College Algebra (3 cr) - Functions, solutions and graphs of linear and quadratic equations, inequalities and systems of equations; logarithmic and exponential functions. Prereq: 051 or suitable placement test score.

Mathematics 355 - Elementary Statistical Methods (4 cr) - Fundamental concepts and techniques which underlie applications to the various disciplines, including descriptive statistics; averages; dispersion; random sampling; binomial, normal, Student T, Chi-square, and F

distributions; estimation and tests of hypothesis; linear regression and correlation; laboratory emphasis on sampling and applications. Prereq: 100 or a suitable placement test score.

COURSES IN CLINICAL LABORATORY SCIENCE (CLS)

- 105. Evolution of Health Care and Health Care Professions (2 cr)** - Study of the history of medicine and the evolution of health care professions in the context of philosophical and cultural influences; examination of various health care systems; analysis of current health care system and health professions in the United States. 3 hrs lecture per week.
- 125. Intro to Clinical Laboratory Science 1 (2 cr.)** Overview of laboratory safety, phlebotomy, immunology, immunohematology, hematology, coagulation, clinical chemistry, body fluid analysis, diagnostic microbiology, and molecular pathology. Major topics are accompanied with introductory lab exercises. 1 hr lec, 2 hrs lab per wk.
- 205. Clinical Orientation (1 cr; pass/fail)** - Hospital introduction to laboratory techniques. Open to students considering a major in Clinical Laboratory Science.
- 295. Medical Terminology (2 cr)** - Examination of bases of medical terms: prefixes, suffixes, roots, combined forms; terms that name the nine basic body systems and organs. 2 hrs lecture per week.
- 365. Body Fluid Analysis (2 cr)** - Theoretical and practical aspects of chemical and microscopic analysis of urine, cerebrospinal fluid, synovial fluid, and serous fluid. 2 hrs lecture per week. Independent lab. Prereq: Biology 285.
- 385. Professional Leadership Development (3 cr)** - Study professional roles, responsibilities, contemporary problems and conflicts as related to leadership and laboratory administration; discuss human resource management, financial management, and education methodologies appropriate for supervisors and managers. 2 hrs lecture, 2 hrs lab per week. Prereq: Junior standing.
- 395. Environment, Health, and Technology (3 cr)** - The changing environment and its relationship to human health, including historical review, current concerns, and future projections. Topics include health effects of radiation, water and air pollutants, antibiotics, emerging infectious diseases, and overpopulation. Case studies will be presented. Prereq: Junior standing. GDR:EL.
- *399. Special Work (1-3 cr)** - Special independent research projects. Credit based on scope of the project. Prereq: Junior standing and consent of chair.
- *402. Microscopy (1 cr.)** - Study of light and electron microscopy techniques for the histology laboratory.
- 405. Clinical Chemistry (4 cr)** - Study physiology of body analytes, organ systems, and clinical procedures corresponding to human disease states; discuss areas unique to clinical chemistry laboratory and professional performance. 3 hrs lecture, 3 hrs lab per week. Prereq: Chemistry 365 or concurrent registration.
- *409. Immunohistochemistry (3 cr.)** - Study the theory and techniques in immunohistochemistry staining.
- *410. Histology Techniques I (3 cr.)** - Study laboratory safety, specimen processing and accessioning, instrumentation, and fixation.
- *411. Histology Techniques II (3 cr.)** - Study techniques for tissue processing, theories of staining, and tissue embedding.

- *412 Histology Instrumentation (3 cr.)** - Study of routine histology instruments; tissue preparation and use of microtomes and other instruments in preparing and staining specimens for microscopic examination.
- 415. Hematology (4 cr)** - Study of the hematopoietic system including the relationship of hematologic disease states to diagnostic characteristics; determine blood and bone marrow cellular morphology; discuss erythrocyte and leukocyte disorders; study techniques and correlate results to disease processes. 3 hrs lecture, 3 hrs lab per week. Prereq: Biology 285.
- *420. Special Stains (6 cr.)** - Use special staining methodology for connective tissue, nerve cells, lipids, amyloid, minerals, pigments, microorganisms, and enzymes.
- *421. Frozen Sections and Cytology Preparation (3 cr.)** - Study the techniques to prepare frozen tissue and sections for microscopic examination.
- 435. Immunology (3 cr)** - Study concepts in immunology and serologic techniques used to diagnose disease; discuss immunodeficiency diseases, autoimmune disorders, immunology of malignancies, and hypersensitivities. 2 hrs lecture, 3 hrs lab per week. Prereq: Biology 285.
- *488. Methodologies in Histology Education (1 cr.)** - Current approaches to education in the histology laboratory.
- *491. Management in Histology (1 cr.)** - Study of histology laboratory management practices.

***CLINICAL PRACTICUM:** These courses will be completed at the affiliated clinical laboratories.