CLS 120 CLINICAL LABORATORY SCIENCES AS A CAREER. (1)
Presentation of information about the various careers in clinical laboratory science via lectures, demonstrations and field trips. Open to students wishing to explore the field of clinical laboratory sciences.

CLS 130 INTRODUCTION TO CLINICAL LABORATORY SCIENCES. (1)
Through lectures, demonstrations and audiovisuals, students are introduced to disease processes, their manifestations, and laboratory studies used for diagnoses and prognoses. Open to students wishing to explore the field of clinical laboratory sciences.

CLS 501 SEMINAR IN ADVANCED HEMATOLOGY. (2)
Study of the biochemical aspects of blood cell physiology and kinetics as applied to practice in the clinical hematology laboratory and a review of current related literature. This course is designed for practicing clinical laboratorians or medical technologists who are pursuing a graduate degree. Prereq: BCH 401G or equivalent and consent of instructor.

CLS 520 REPRODUCTIVE LABORATORY SCIENCE. (3)
This is a course designed to educate students in basic theories, procedures and quality assurance concepts of assisted reproduction. It will consist of two lectures per week and a limited number of three-hour laboratories. Computer-assisted instruction and video-tapes will also be used. Prereq: Admission to the professional CLS program; or a baccalaureate degree with CLS certification; or consent of instructor.

CLS 610 ETHICS IN CLINICAL SCIENCES RESEARCH. (1)
Students will examine ethical issues in biomedical research using a case-study approach. Representative issues addressed may include data selection and retention, plagiarism, scientific review of grants and manuscripts, scientific misconduct, and informed consent. Prereq: Graduate student status. (Same as CD/CNU/PT/RAS 610.)

¶CLS 815 HISTOTECHNOLOGY I.

CLS 816 HISTOTECHNOLOGY II. (3)
The study of principles and applications of microtomy, frozen sectioning and some special staining techniques.

CLS 822 BIOCHEMISTRY FOR CLINICAL SCIENCES. (3)
A presentation of the biochemistry of carbohydrates, lipids, proteins, amino acids and nucleic acids and exploration of major metabolic pathways as the basis of clinical chemistry. Case studies will be used to emphasize the role of biochemistry in the understanding of clinical science. Prereq: CHE 105, 107 and 115, CHE 230 or CHE 236 or equivalent and consent of instructor.

*CLS 832 GENERAL CLINICAL CHEMISTRY AND INSTRUMENTATION. (5)
The study of the theory and practice of clinical chemistry laboratory testing, including quality control, instrumentation principles, problem-solving, and appreciation of accuracy of and confidentiality for patient laboratory findings. Lecture: 3 hours; laboratory: 2 hours per week. Prereq: Admission into the Clinical Laboratory Sciences Professional Program; Biochemistry (may be taken concurrently).

*CLS 833 CLINICAL HEMATOLOGY AND BODY FLUID ANALYSIS. (5)
The theory and practice of clinical hematology laboratory testing, including the performance of manual and automated procedures, instrumentation principles, quality assurance, and problem solving. Hematopoiesis, hemostasis, blood cell function and body fluid physiology are discussed as they relate to clinical laboratory practice. Special emphasis is placed on the relationship of clinical hematology and body fluids analysis testing to pathophysiology and on the acquisition of valid test results. Lecture: 2 hours, laboratory, 3 hours per week. Prereq: Admission into the Clinical Laboratory Sciences Program or consent of the instructor.

*CLS 835 CLINICAL IMMUNOLOGY. (3)
An overview of immunology with a molecular basis for the immune responses and the role of genetics in immunological disorders. Molecular biological techniques in the modern clinical laboratory will be emphasized. Prereq: Admission into the Clinical Laboratory Sciences Professional Program.
**CLS 836 LABORATORY MANAGEMENT.** (3)
An overview of clinical laboratory management issues. Content will include the management process, managing change, personnel issues, regulatory issues, leadership, quality improvement strategies, principles of education related to the management process and other relevant topics. Prereq: Admission into the Clinical Laboratory Sciences Professional Program.

**CLS 838 BASIC IMMUNOHEMATOLOGY.** (5)
Introduction to the principles and practice of blood banking including blood group systems, routine serologic testing, blood collection and processing and component therapy. Lecture, two hours; laboratory, three hours per week. Prereq: Admission to the Clinical Laboratory Sciences Program and CLS 835 or equivalent.

**CLS 843 ADVANCED CLINICAL HEMATOLOGY AND BODY FLUID ANALYSIS.** (3)
The theory and practice of clinical hematology laboratory testing as it relates to hematological disorders and disorders of body fluids. Anemias, hemostasis and thrombotic disorders, leukemias and non-malignant leukocyte disorders, and body fluid disorders, including the reproductive system are discussed as they relate to clinical laboratory practice. Special emphasis is placed on pathophysiology, the clinical correlation of laboratory test results with hematological and body fluids disorders, and the interpretation and resolution of discrepant results. Prereq: CLS 833 or consent of the instructor.

**CLS 844 ADVANCED CLINICAL CHEMISTRY.** (3)
A study of the theory and evaluation of specialized clinical chemistry testing, including toxicology, therapeutic drug monitoring, endocrine function, and quality assurance issues. Prereq: Admission into the Clinical Laboratory Sciences Professional Program; biochemistry, immunology (may be taken concurrently) and CLS 832 or equivalent.

**CLS 845 CLINICAL IMMUNOLOGY AND SEROLOGY I.**

**CLS 848 ADVANCED IMMUNOHEMATOLOGY.** (3)
This course emphasizes clinical interpretation and problem solving. Antibody identification, selection of blood components, transfusion complications, hemolytic disease of the newborn, autoimmune hemolytic anemia and quality assurance are included. Prereq: Admission to the Clinical Laboratory Sciences Program and CLS 838 or equivalent.

**CLS 851 BASIC CLINICAL MICROBIOLOGY.** (5)
The study of medically significant microbiology, including commensal flora, normal flora and pathogens. Lectures also cover microbial physiology, interactions between host and pathogenic microorganisms, and the clinical and epidemiological consequences of these interactions. The laboratory will cover microscopic, cultural and immunological techniques used for the recovery, isolation and identification of clinically significant microorganisms. Lecture, two hours; laboratory, three hours per week. Prereq: Admission to the Clinical Laboratory Sciences Program.

**CLS 855 CLINICAL IMMUNOLOGY AND SEROLOGY II.**

**CLS 856 ADVANCED CLINICAL MICROBIOLOGY.** (3)
The study of medically important bacteria, with an emphasis on anaerobes and mycobacteria, and clinically significant fungi, parasites and viruses. Clinical bacteriology knowledge will be applied through case studies. Prereq: Admission to the Clinical Laboratory Sciences program and CLS 851 or equivalent.

**CLS 860 BLOOD COLLECTION.** (1)
The theory and practice of blood collection related to routine and special specimen collection for clinical laboratory testing. Particular emphasis is placed on quality assurance and safe practice issues associated with venipuncture and skin puncture. Students perform venipunctures on artificial arms, actual patients and fellow students. The course includes a mandatory clinical component. Experience collecting venous blood specimens for laboratory testing. Students will receive instructions on proper procedures for phlebotomy and will practice on mannequin arms and each other prior to collecting blood from adult ambulatory and bed patients; pediatric patients; and nursery patients. Offered on a Pass/Fail basis only. Prereq: Admission into the Clinical Laboratory Sciences Professional Program, or consent of the instructor and completion of required immunizations.

**CLS 861 BLOOD COLLECTION II.**

**CLS 867 EDUCATIONAL PRINCIPLES IN CLS.**
CLS 871 SURVEY OF HEMATOLOGY AND LABORATORY MATH. (2)
An overview of basic mathematical computations used in common laboratory procedures. A review of structure, function and identification of abnormal blood cells. Prereq: Associate degree in Medical Laboratory Technology.

CLS 872 CLINICAL CHEMISTRY SURVEY. (1)
An overview of the theory and practice of clinical chemistry, including instrumentation and calculations. Prereq: Admission to the Clinical Laboratory Sciences program or consent of instructor.

CLS 873 CLINICAL MICROBIOLOGY SURVEY. (2)
This course is designed as an overview of medically significant bacteria including pathogens, commensals and those which comprise normal flora. The course will review basic morphology, microbial physiology as well as interaction between the host and pathogen. New procedures for isolation and identification of clinically significant bacteria will be emphasized. Recent taxonomic changes will also be discussed. Prereq: Admission to the Clinical Laboratory Science Program or permission of the instructor.

CLS 874 SURVEY OF IMMUNOHEMATOLOGY. (1)
This course is an overview of blood banking including important blood group systems, compatibility testing procedures and collection and processing of blood and blood components. Emphasis is placed on current regulations and standards for blood banks. Prereq: Admission to the Clinical Laboratory Science Program or permission of the instructor.

†CLS 880 CLINICAL PRACTICUM IN CLINICAL LABORATORY SCIENCES.

*CLS 881 IMMUNOHEMATOLOGY PRACTICUM. (1-5)
A supervised practicum in which the student integrates theory and practice of immunohematology in a clinical setting. Offered on a Pass/Fail basis only. Laboratory, 35-40 hours per week. The number of credits will depend on the student’s prior experience. Prereq: Admission into the Clinical Laboratory Sciences Program and CLS 848 (may be taken concurrently).

*CLS 882 PRACTICUM IN CLINICAL CHEMISTRY. (1-5)
A supervised practicum in which the student integrates theory and practice of clinical chemistry in a health care setting. Offered on a Pass/Fail basis only. Laboratory, 35-40 hours per week. The number of credits will depend on the student’s prior experience. Prereq: Admission into the Clinical Laboratory Sciences Program and CLS 844 (may be taken concurrently).

*CLS 883 PRACTICUM IN CLINICAL HEMATOLOGY. (1-5)
A supervised practicum in which the student integrates theory and practice of clinical hematology in a health care setting. Offered on a Pass/Fail basis only. Laboratory, 35-40 hours per week. The number of credits will depend on the student’s prior experience. Prereq: Admission into the Clinical Laboratory Sciences Program and CLS 843 (may be taken concurrently).

*CLS 884 PRACTICUM IN CLINICAL MICROBIOLOGY. (1-5)
A supervised practicum in which the student integrates theory and practice of clinical microbiology in a health care setting. Offered on a Pass/Fail basis only. Laboratory, 35-40 hours per week. The number of credits will depend on the student’s prior experience. Prereq: Admission into the Clinical Laboratory Sciences Program and CLS 856 (may be taken concurrently).

CLS 885 SPECIAL TOPICS PRACTICUM. (1-8)
This course offers students an opportunity to observe and learn in areas of clinical laboratory sciences not found in the routine laboratory, such as flow cytometry, electron microscopy, DNA analysis. Rotations are arranged to meet needs of each student. May be repeated to a maximum of eight credits. Laboratory, 35-40 hours per week. Prereq: Enrollment in CLS professional program or consent of Division Chair.

*CLS 890 INDEPENDENT LABORATORY INVESTIGATION. (1-3)
Students will demonstrate knowledge and expertise in CLS through interpretation and integration of CLS issues. Student will analyze laboratory data through patient-focused scenarios and integrate information from multiple laboratory reports for the patient care management. Students will apply the principles of research technique to analyze problems arising from technical methods, disease correlation, or other pertinent problem areas in laboratory sciences and will use library sources, computer skills, and presentation skills in the pursuit of solutions to identified problems. Requirements of the CLS program for CLS 890: total of 3 credit hours. Prereq: Admission into the clinical laboratory sciences program and STA 291 or equivalent.
CLS 895 ADVANCED TOPICS IN CLINICAL LABORATORY SCIENCES (INDEPENDENT STUDY). (1-6)
An elective for students in selected subjects in-depth or carry out a limited laboratory project. Prereq: Consent of Division Chair.