

CLINICAL LABORATORY SCIENCE (CLS)

CLS 407 Clinical Laboratory Operations Credits: 2

Typically Offered: Summer.

Course Description: This course provides a basic introduction to the theory, practical application, technical performance and evaluation of laboratory skills specific to the practice of clinical laboratory science. Laboratory safety; microscopy; pipetting; general laboratory equipment; quality control; mathematics; phlebotomy; pre-analytic, analytic and post-analytic processes, including specimen collection, processing and transport to maintain test result integrity, will be addressed.

Prerequisite(s): Acceptance in UNMC Clinical Laboratory Training program.

CLS 408 Introduction to Clinical Hematology Credits: 2

Typically Offered: Summer.

Course Description: This course introduces the theory, practical application, technical performance and evaluation of hematological and hemostasis procedures. Correlation of laboratory data with the diagnosis of erythrocyte, leukocyte and bleeding/clotting disorders will be introduced. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 409 Introduction to Clinical Microbiology Credits: 2

Typically Offered: Summer.

Course Description: This course introduces the theory, practical application, technical performance and evaluation of procedures for isolation, identification and susceptibility testing of infectious disease organisms in humans. The course primarily focuses on bacteriology, but will include introductory coverage of parasitology, mycology and virology.

Prerequisite(s): Acceptance in UNMC Clinical Laboratory Training program.

CLS 410 Introduction to Clinical Chemistry and Urinalysis Credits: 1

Typically Offered: Summer.

Course Description: This course introduces the theory, practical application, technical performance and evaluation of basic laboratory skills and methods in clinical chemistry and urinalysis. The course focuses on the correlation of laboratory data with the diagnosis of renal conditions, but will include introductory coverage of carbohydrate, liver and protein conditions, as well as enzymes. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 411 Introduction to Clinical Immunohematology Credits: 1

Typically Offered: Summer.

Course Description: This course introduces the theory, practical application, technical performance and evaluation of immunohematology procedures required to provide compatible blood components for transfusion. Methods for collection, processing, storage and transfusion of blood and blood components will be presented. Immunohematology procedures that assist in the diagnosis and management of hemolytic conditions will be introduced. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 412 Clinical Lab Science Theory, Application, and Correlation

Credits: 5

Typically Offered: Spring.

Course Description: This course includes the application, evaluation and correlation of laboratory procedures used in the diagnosis and treatment of common disease states. Opportunities for building critical thinking, problem solving, leadership, oral communication, professionalism, and team work skills are provided in small group clinical case discussions.

Prerequisite(s): Acceptance in UNMC Clinical Laboratory Training program.

CLS 413 Clinical Endocrinology and Toxicology Credits: 1

Typically Offered: Fall.

Course Description: This course introduces the theory, practical application, and evaluation of clinical chemistry laboratory procedures. Correlation of clinical laboratory data with the diagnosis and treatment of endocrine disorders, toxicology disturbances and therapeutic drug monitoring is emphasized. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 414 Clinical Chemistry and Urinalysis I Credits: 2

Typically Offered: Fall.

Course Description: This course expands on the theory, practical application, and evaluation of basic laboratory procedures introduced in CLS 407 Clinical Laboratory Operations and CLS 410 Introduction to Clinical Chemistry and Urinalysis, with an emphasis on common automated methodologies used in clinical chemistry and urinalysis laboratories. This course will focus on the interpretation, evaluation and correlation of clinical laboratory data with the diagnosis and treatment monitoring of carbohydrate, renal, hepatic, protein, cardiac, lipid/lipoprotein, major and minor electrolyte, enzyme, pancreatic-gastrointestinal and acid-base disorders. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 415 Clinical Chemistry and Urinalysis II Credits: 2

Typically Offered: Spring.

Course Description: This course expands on the theory, practical application, and evaluation of laboratory procedures introduced in CLS 414 Clinical Chemistry and Urinalysis I and CLS 444 Clinical Core Laboratory Practical I. Correlation of clinical laboratory data with the diagnosis and treatment monitoring of carbohydrate, renal, hepatic, cardiac, lipid/lipoprotein, protein, major and minor electrolyte, trace element, enzyme, pancreatic-gastrointestinal and acid-base disorders; tumor markers; and inborn errors of metabolism is emphasized. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 416 Clinical Hematology I Credits: 2

Typically Offered: Fall.

Course Description: This course expands on the theory, practical application, and evaluation of hematological and hemostasis procedures introduced in CLS 408 Introduction to Clinical Hematology and of basic laboratory skills in CLS 407 Clinical Laboratory Operations. Correlation of clinical laboratory data with the diagnosis and treatment of erythrocyte, leukocyte and bleeding/clotting disorders will be emphasized. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 417 Clinical Hematology II Credits: 2**Typically Offered:** Spring.

Course Description: This course expands on the theory, practical application, and evaluation of hematological and hemostasis procedures introduced in CLS 416 Clinical Hematology I and CLS 444 Clinical Core Laboratory Practicum I, and includes the analysis of cerebrospinal, synovial and serous fluids. Correlation of clinical laboratory data with the diagnosis and treatment of erythrocyte, leukocyte and bleeding/clotting disorders will be emphasized. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 418 Clinical Microbiology I Credits: 2**Typically Offered:** Fall.

Course Description: This course expands on the theory, practical application, and evaluation of procedures for isolation, identification and susceptibility testing of infectious disease organisms in humans introduced in CLS 409 Introduction to Clinical Microbiology and of basic laboratory skills in CLS 407 Clinical Laboratory Operations. The course primarily focuses on bacteriology, but will include coverage of parasitology, mycology and virology. Course content emphasizes the correlation of clinical laboratory data with the patient's diagnosis and treatment. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 419 Clinical Microbiology II Credits: 2**Typically Offered:** Spring.

Course Description: This course builds on the theory, practical application and evaluation of the procedures for isolation, identification and susceptibility testing of infectious disease organisms in humans introduced in CLS 418 Clinical Microbiology I and CLS 448 Clinical Microbiology Laboratory Practicum I. This course includes bacteriology, mycology, parasitology, and virology content, and will emphasize the correlation of clinical laboratory data with the patient's diagnosis and treatment. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 420 Clinical Immunology and Molecular Diagnostics Credits: 2**Typically Offered:** Fall.

Course Description: This course includes the theory, practical application, and evaluation of immunological components and infectious disease serology. The principles and methodologies used in the assessment of immunologically related disorders, including hypersensitivity reactions, autoimmune, immunoproliferative, immunodeficient disorders and infectious disease are included. The course emphasizes the correlation of clinical laboratory data with the patient's diagnosis and treatment. The theory and application of molecular diagnostic tools, such as polymerase chain reaction (PCR), nucleic acid probes, and microarrays are also addressed. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 422 Clinical Immunohematology I Credits: 2**Typically Offered:** Fall.

Course Description: This course expands on the theory, practical application, and evaluation of immunohematology procedures introduced in CLS 411 Introduction to Clinical Immunohematology and basic laboratory skills in CLS 407 Clinical Laboratory Operations. The primary focus will be on processes required to provide compatible blood components for transfusion. Processes for donor blood collection and blood component processing and storage will be discussed. Immunohematology procedures that assist in the diagnosis and management of hemolytic conditions will be addressed. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 423 Clinical Immunohematology II Credits: 2**Typically Offered:** Spring.

Course Description: This course expands on the theory, practical application, and evaluation of immunohematology procedures presented in CLS 422 Clinical Immunohematology I and CLS 442 Clinical Immunohematology Laboratory Practicum I. There is an emphasis on the application of immunohematology procedures used for the resolution of complex immunohematology problems. Proper selection of immunohematology procedures that assist in the diagnosis and management of hemolytic conditions will be discussed. Concepts in patient blood management and the adverse effects of transfusion will be presented. Quality management as it applies to transfusion medicine will be addressed. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 430 Clinical Laboratory Management I Credits: 2**Typically Offered:** Fall.

Course Description: This course introduces the theory, practical application and evaluation of laboratory management principles in healthcare, including safety, research, educational methodology, quality control, ethics, laboratory operations, point-of-care testing, scope of practice, and the job application process. Opportunities for building critical thinking, problem-solving, research, communication, professionalism, management and leadership skills are provided. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 431 Clinical Laboratory Management II Credits: 3**Typically Offered:** Fall.

Course Description: This course builds on CLS 430 Clinical Laboratory Management I, and includes the theory, practical application and evaluation of laboratory management principles in compliance and regulatory issues, test utilization, human resource management, written and oral communication, method evaluation, educational methodology, professionalism, quality improvement and financial resource management. Opportunities for building critical thinking, problem-solving, team work, communication, professionalism, management and leadership skills are provided. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 442 Clinical Immunohematology Laboratory Practicum I Credits: 1**Typically Offered:** Fall.

Course Description: This course provides practical application in a clinical laboratory setting for the technical performance and evaluation of clinical immunohematology procedures and preparation of blood components. Course content will include new skills and procedures, in addition to the skills and procedures presented in CLS 407 Clinical Laboratory Operations and CLS 411 Introduction to Clinical Immunohematology. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 443 Clinical Immunohematology Laboratory Practicum II Credits: 1**Typically Offered:** Spring.

Course Description: This course provides practical application in a clinical laboratory setting for the technical performance and evaluation of clinical immunohematology procedures and preparation of blood components. Course content will include new skills procedures, in addition to the skills and procedures presented in CLS 442 Clinical Immunohematology Laboratory Practicum I. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 444 Clinical Core Laboratory Practicum I Credits: 1

Typically Offered: Fall.

Course Description: This course provides practical application in a clinical laboratory setting for the technical performance and evaluation of clinical hematology/hemostasis, chemistry and urinalysis procedures. Course content will include new skills and procedures and the application of automation and automatic verification techniques, building on the skills and procedures presented in CLS 407 Clinical Laboratory Operations, CLS 408 Introduction to Clinical Hematology and CLS 410 Introduction to Clinical Chemistry and Urinalysis. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 445 Clinical Core Laboratory Practicum II Credits: 1

Typically Offered: Spring.

Course Description: This course provides practical application in a clinical laboratory setting for the technical performance and evaluation of clinical hematology/hemostasis, chemistry and urinalysis procedures. Technical content will include new skills and procedures, in addition to the skills and procedures presented in CLS 444 Clinical Core Laboratory Practicum I. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 448 Clinical Microbiology Laboratory Practicum I Credits: 1

Typically Offered: Fall.

Course Description: This course provides practical application in a clinical laboratory setting for the technical performance and evaluation of clinical microbiology procedures. Course content will include new skills and procedures, in addition to the skills and procedures presented in CLS 407 Clinical Laboratory Operations and CLS 409 Introduction to Clinical Microbiology. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.

CLS 449 Clinical Microbiology Laboratory Practicum II Credits: 1

Typically Offered: Spring.

Course Description: This course provides practical application in a clinical laboratory setting for the technical performance and evaluation of clinical microbiology procedures. Course content will include new skills and procedures, in addition to the skills and procedures presented in CLS 448 Clinical Microbiology Laboratory Practicum I. **Prerequisite(s):** Acceptance in UNMC Clinical Laboratory Training program.