

# DEPARTMENT OF MEDICAL LABORATORY SCIENCES

**Teresa S. Nadder, Ph.D., MLS(ASCP)<sup>CM</sup>**  
Associate professor and chair

[cls.chp.vcu.edu \(https://cls.chp.vcu.edu/\)](https://cls.chp.vcu.edu/)

The Department of Medical Laboratory Sciences supports the philosophy and mission of the university and the College of Health Professions, and provides an environment that nurtures excellence in education, research and service. The programs offered by the department are dedicated to enhancing and promoting medical laboratory science. The department fosters fair and equitable educational experiences for students of all ages and diverse backgrounds. Strong affiliations with clinical educators and the integration of innovative technology in the academic setting facilitate both the education and research goals of the department.

The department provides students with superior studies in medical laboratory science, including both theoretical and applied clinical education, and develops problem-solving expertise, leadership capabilities and communication skills. By providing advanced theoretical and technical education, the graduate program serves to maintain and update the competency of laboratory professionals and to prepare students to assume roles as laboratory supervisors, university educators and researchers. A mature, responsible approach to the acquisition of knowledge is cultivated in order to establish continuing intellectual growth and an enthusiasm for the profession.

The department meets the growing health care needs of the community by providing highly competent and professional medical laboratory scientists who will be able to function effectively upon entrance into the field and be prepared to explore future scientific and technological advances in laboratory science. And the department promotes continued professional development and personal growth for the faculty and staff to fulfill and balance the individual's abilities and aspirations with the departmental, college and institutional mission and needs. Members of the department conduct themselves in a forthright, ethical manner and practice the highest standard of quality performance.

The objectives of the Department of Medical Laboratory Sciences are:

- To provide an educational program that prepares students to accurately perform and evaluate analytical tests on body fluids, cells and products
- To foster the development of professional conduct, interpersonal communication skills and ethical principles
- To develop and promote strategies for lifelong learning and to encourage continued professional growth through research, continued education and active participation in professional societies

## History

Clinical and medical laboratory scientists have been trained on the MCV Campus since 1927. However, the Department (formerly school) of Medical Technology was not formally established until 1952, at which time the curriculum included six months of didactic experience with lectures and laboratory sessions held in the department, followed by a six-month rotation through the clinical laboratories. The school offered a certificate and/or bachelor's degree program; the certificate program was discontinued during the 1961-62 school year.

In 1974 the curriculum was expanded to the current two-plus-two year program in which students complete 60 semester hours of prerequisites followed by two years of professional course work. The graduate program in medical laboratory sciences was started in 1967 to provide advanced education for certified medical technologists/clinical laboratory scientists. In 1985 the program was modified to allow candidates holding a degree in another area of science to obtain graduate education in medical laboratory sciences.

In 1994, the department name was changed to the Department of Clinical Laboratory Sciences. In 2003, an accelerated track was initiated to integrate the undergraduate and graduate programs, which requires completion of two years of prerequisites and three years of full-time professional course work, and leads to the simultaneous awarding of both the bachelor's and master's degrees.

To aggressively address the critical shortage of clinical laboratory scientists and meet the growing staffing needs of rural Virginia, in 2014 the department began its delivery of the Bachelor of Science using facilities at the Southwest Virginia Higher Education Center in Abingdon, Virginia. Students receive their curriculum of study via two-way synchronous distance education and clinical training rotations in southwest Virginia and eastern Tennessee.

In 2020, the department was approved for a name change and became the Department of Medical Laboratory Sciences.

## Facilities

The Department of Medical Laboratory Sciences is located at the College of Health Professions building at 900 East Leigh Street on the MCV Campus. Faculty and clerical offices are located in this facility, as well as student classrooms, general teaching laboratory, study areas and a student lounge. Classrooms and a general teaching laboratory are also present at the Southwest Virginia Higher Education Center at One Partnership Circle, Abingdon, Virginia.

- Medical Laboratory Sciences, Bachelor of Science (B.S.) (<http://bulletin.vcu.edu/undergraduate/allied-health-professions/medical-laboratory-sciences/medical-laboratory-sciences-bs/>)

### **CLLS 201. Introduction to Clinical Laboratory Science. 1 Hour.**

Semester course; 1 lecture hour. 1 credit. Open to students on the Monroe Park Campus who are interested in clinical laboratory science/medical technology as a career. Presentation and discussion of clinical laboratory science including an introduction to each of the specific areas of concentration, job opportunities in the profession and a tour of a hospital laboratory. Graded as pass/fail.

### **CLLS 300. Basic Concepts. 1.5 Hour.**

Semester course; 1 lecture and 1 laboratory hours. 1.5 credits. An introduction to the basic concepts/techniques applicable to all laboratory science areas. Includes optical physics, quality control, laboratory safety, medical terminology and pipetting techniques along with other basic subjects.

### **CLLS 301. Hematology. 1.5-3.5 Hours.**

Semester course; 2 lecture and 3 laboratory hours. 1.5-3.5 credits. May be repeated for 3.5 credits. Enrollment restricted to CLS majors. Provides a study of the blood and blood-forming tissues. Focuses on basic hematologic techniques and accurate identification of normal and abnormal hematologic cells. Introduces the hemostatic mechanism. Correlates the roles of normal hematologic cells with normal hematologic homeostasis. This course qualifies for the option of proficiency credits for certified medical laboratory technicians.

**CLLS 302. Abnormal Hematology. 1.5-4 Hours.**

Semester course; 2.5 lecture and 3 laboratory hours. 1.5-4 credits. May be repeated for a total of 4 credits. Prerequisite: CLLS 301. Enrollment restricted to CLS majors. Provides a study of the blood and blood-forming tissues. Focuses on basic hematologic techniques and normal and abnormal cell identification accuracy. Correlates the roles of abnormal cells with pathological conditions. Focuses on abnormal hemostasis. This course qualifies for the option of proficiency credits for certified medical laboratory technicians.

**CLLS 304. Urine and Body Fluid Analysis. 1-2 Hours.**

Semester course; 1.5 lecture and 1 laboratory hours. 1-2 credits. A study of the principles and practices of urinalysis, kidney function, cerebrospinal fluid and other body fluids.

**CLLS 306. Immunohematology. 2.5-4.5 Hours.**

Semester course; 2.5 lecture and 4 laboratory hours. 2.5-4.5 credits. Prerequisite: CLLS 310. A study of the theory and principles of blood banking with an emphasis on methods and techniques used in the laboratory for cell typing, cross-matching and antibody identification.

**CLLS 307. Introduction to Pathogenic Microbiology. 1-3 Hours.**

Semester course; 3 lecture hours. 1-3 credits. May be taken as 1 credit each for study of basic parasitology, mycology or virology. Includes fundamentals of parasites, fungi and viruses as potentially pathogenic microorganisms.

**CLLS 308. Pathogenic Bacteriology. 3-5 Hours.**

Semester course; 3 lecture hours and 4 laboratory hours. 3-5 credits. Emphasis is placed on pathogenic bacteria, techniques, pathogenesis, epidemiology, isolation and identification, and antimicrobial susceptibility testing.

**CLLS 310. Clinical Immunology. 3-4.5 Hours.**

Semester course; 3.5 lecture and 2 laboratory hours. 3-4.5 credits. Introduces the basic principles of immunology, serology and molecular diagnostics. Emphasis is placed on laboratory evaluation of the immune response including both cellular and humoral aspects. Serologic techniques are practiced in the laboratory sessions.

**CLLS 311. Clinical Chemistry and Instrumentation I. 3-5 Hours.**

Semester course; 3 lecture and 4 laboratory hours. 3-5 credits. A study of human physiology and metabolism in health and various disease states. Topics include energy and nitrogen metabolism and proteins in body fluids. Emphasis is placed on the application of quantitative analytical methods and instrumentation for the chemical characterization of body fluids to provide clinically useful information for the diagnosis and treatment of diseases.

**CLLS 312. Clinical Chemistry and Instrumentation II. 4-5 Hours.**

Semester course; 4 lecture and 2 laboratory hours. 4-5 credits. Prerequisite: CLLS 311 or permission of the instructor. A study of human physiology and metabolism in health and various disease states. Topics include water and ion balance, clinical enzymology, therapeutic drug monitoring, and toxicology. Emphasis is placed on the application of quantitative analytical methods and instrumentation for the chemical characterization of body fluids to provide clinically useful information for the diagnosis and treatment of diseases.

**CLLS 337. Clinical Education. 1 Hour.**

Semester course; 120 clock hours. 1 credit. Supervised clinical experience in hospitals across the state is designed to give the student a broader clinical education and to provide venipuncture experience. In addition to the application of academically acquired knowledge, this affiliation provides an opportunity for the student to correlate each area of study into one composite picture for final laboratory diagnosis. Closer working relationships with other allied health personnel is an important aspect of this affiliation. Graded as pass/fail.

**CLLS 407. Interpretive Immunohematology. 2-2.5 Hours.**

Semester course; 2.5 lecture hours. 2-2.5 credits. Prerequisites: CLLS 306 and 310, or permission of instructor. Advanced study of the principles of immunohematology and immunology with major emphasis on blood group systems and blood components. Includes the application of laboratory data and techniques to solve problems in blood banking and immunology.

**CLLS 408. Advanced Microbiology. 2 Hours.**

Semester course; 2 lecture hours. 2 credits. Prerequisites: CLLS 307 and 308, or permission of instructor. Advanced study of the principles of pathogenic microbiology. Includes the application of laboratory data and techniques to solve problems in the clinical microbiology laboratory.

**CLLS 409. Interpretive Hematology. 2 Hours.**

Semester course; 2 lecture hours. 2 credits. Prerequisites: CLLS 301-302 and 485, or permission of instructor. Advanced study of the principles of hematopoiesis and their pathophysiological correlation to hematological disorders. Interpretation of morphological findings are correlated with case histories. Includes homeostatic problems.

**CLLS 410. Advanced Clinical Chemistry and Instrumentation. 2 Hours.**

Semester course; 2 lecture hours. 2 credits. Prerequisites: CLLS 311-312, or permission of instructor. Presents an advanced study of (1) the principles of clinical chemistry as related to intermediary metabolism and pathology and (2) laboratory and hospital information systems. Includes the application of laboratory data and technologies to solve problems in analytical methods and instruments.

**CLLS 411. Principles of Education/Management. 2.5-3.5 Hours.**

Semester course; 3 lecture hours. 2.5-3.5 credits. Introduces fundamental educational theories and practice, principles of management and employee relations and health-care issues from a global perspective with an emphasis on multicultural diversity. Stresses the application of these theories in the clinical laboratory.

**CLLS 412. Senior Seminar. 1 Hour.**

Semester course; 1 lecture hour. 1 credit. Seminars are presented on various aspects of professionalism, experimental design and critical evaluation of scientific literature. A simulated registry exam is given at the conclusion. Graded as pass/fail.

**CLLS 415. Special Topics in Clinical Laboratory Sciences. 1-6 Hours.**

Semester course; 1-6 credits. Course provides for tutorial studies, laboratory experience and/or library assignments in specialized areas for those students who have previous course work or laboratory experience in a specific subject.

**CLLS 438. Research Paper. 1 Hour.**

Semester course; 1 lecture hour. 1 credit. This course is designed to introduce the student to the fundamentals of scientific writing.

**CLLS 483. Biochemistry Practicum. 1-4.5 Hours.**

Semester course; 40-180 clock hours. 1-4.5 credits. Prerequisites: CLLS 311-312. Individual participation in hospital chemistry laboratories. Students gain practical experience in the use of procedures and instruments by working with the staff. After gaining competence, students are expected to perform and sign out routine laboratory work under supervision. Graded as pass/fail.

**CLLS 485. Hematology Practicum. 1-4.5 Hours.**

Semester course; 40-180 clock hours. 1-4.5 credits. Prerequisites: CLLS 301-302. Individual participation in hospital hematology laboratories. Students gain practical experience in the use of procedures and instruments by working with the staff. After gaining competence, the students are expected to perform and sign out routine laboratory work under supervision. Graded as pass/fail.

**CLLS 493. Clinical Microbiology Practicum. 1-4.5 Hours.**

Semester course; 40-180 clock hours. 1-4.5 credits. Prerequisites: CLLS 307-308. Individual participation in hospital bacteriology laboratories. Students gain practical experience in the performance and use of procedures by working with the clinical staff. After gaining competence, the students are expected to properly perform and sign out routine laboratory work under supervision. Graded as pass/fail.

**CLLS 494. Miscellaneous Clinical Practicum. 1-4.5 Hours.**

Semester course; 40-180 clock hours. 1-4.5 credits. Prerequisites: CLLS 301-302, 308, 310, 311-312 or permission of instructor. Students gain practical experience in the use of instruments and the performance of procedures by working with the clinical staff. After gaining competence, students are expected to properly perform and sign out routine laboratory work under supervision. Graded as pass/fail.

**CLLS 496. Blood Bank Practicum. 1-4.5 Hours.**

Semester course; 40-180 clock hours. 1-4.5 credits. Prerequisite: CLLS 306. Individual participation in hospital blood bank laboratories and Virginia Blood Services. Students gain practical experience in the use of procedures and instruments by working with the staff. Donor drawing and component preparation is observed. After gaining competence, the students are expected to properly perform and sign out routine laboratory work under supervision. Graded as pass/fail.