

UNIVERSITY *of* WEST FLORIDA

MEDICAL LABORATORY SCIENCES

PROGRAM IN MEDICAL LABORATORY
Handbook for Students



UNIVERSITY of WEST FLORIDA

OUR MISSION

At the University of West Florida, we believe in the power of higher education to drive change: on campus, in our region, across the state and around the world. We're equipping today's students with the knowledge and skills needed to become tomorrow's leaders, blazing new paths, shaping their environment and creating an even brighter future.

OUR VISION

A spirited community of learners, launching the next generation of big thinkers who will change the world.

OUR VALUES

Our institutional values—shared by students, faculty and staff—make UWF a great place to learn and to work. UWF maintains policies and practices and pursues initiatives congruent with our values.

UWF Operates with INTEGRITY in all Matters: Doing the Right Thing for the Right Reason.

CARING Maintaining a safe, dynamic learning and working environment that fosters the development of individual potential.

COLLABORATION Promoting a culture of supportive and cooperative interactions and communication to advance and achieve shared expectations and goals.

CREATIVITY Providing opportunities to imagine, innovate, inspire, and express different approaches and solutions to existing and anticipated needs and challenges.

ENTREPRENEURSHIP Encouraging a culture that identifies opportunities to initiate change.

INCLUSIVENESS Welcoming, respecting, and celebrating the differences and the similarities among people and ideas.

INNOVATION Exploring, expanding, and enhancing learning as well as knowledge through transformational experiences.

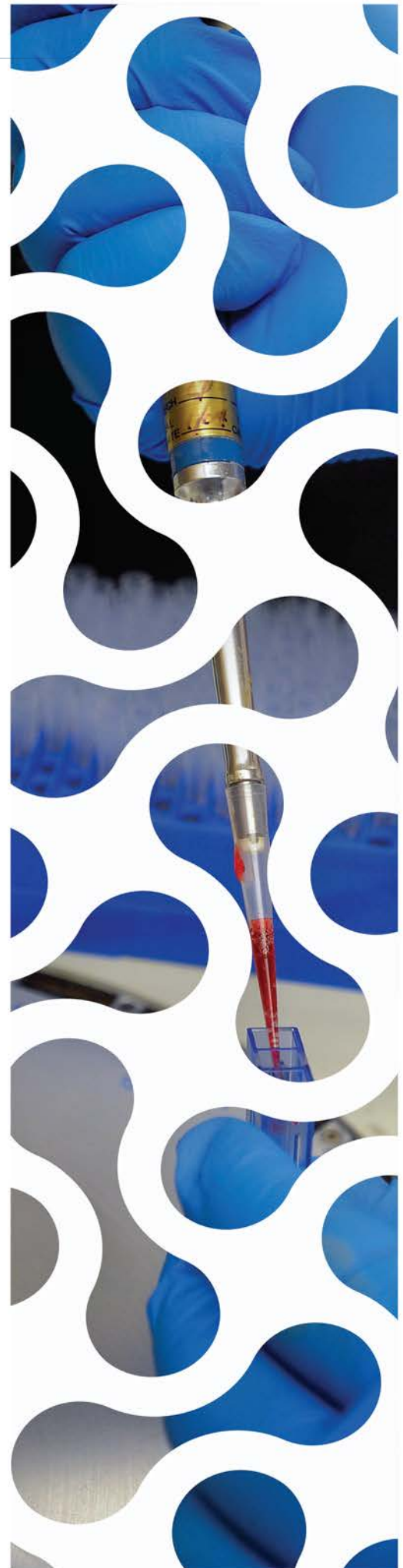


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MESSAGE TO THE STUDENT

Dear Student,

A bachelor's degree in Clinical Laboratory Sciences (CLS) and board certification as a medical laboratory scientist (formerly known as medical technologist) are valuable career assets. For someone with an aptitude in science and an interest in human health, this is an excellent profession. It combines the application of the methods of biology, chemistry, computer technology, and medicine on a daily basis.

The healthcare industry is growing by leaps and bounds. Clinical laboratory medicine is one of the fastest growing industries in the United States and around the world. Medical laboratory professionals have many job opportunities due to the shortage of medical laboratory scientists. This shortage is projected to continue as our population grows older and stimulates the demand for more testing. More employment opportunities will occur due to the number of medical laboratory scientists who will be retiring in the next several years. Graduates of the program at the University of West Florida will continue to find employment in hospitals, clinics, reference laboratories, cancer research and diagnostics to name a few. With a national certification by the American Society for Clinical Pathology, graduates can work in any state. Most alumni of the program stay in Florida, but our alumni can be found working in Alabama, Georgia, Nebraska, West Virginia, Alaska and even Hawaii.

Clinical laboratory work is ever changing to keep pace with discoveries and technology. The classic disciplines of hematology—the study of blood cells and disease and microbiology—the study of bacteria, viruses, fungi and parasites are good examples of this trend. Classic diagnosis relies on growth characteristics and biochemical analysis, and this is now augmented by analysis of the patient's or pathogen's genome. Antibiotic resistant bacteria, such as MRSA, can be rapidly identified by molecular methods. Leukemia can be classified by specific mutations using techniques like DNA chip array and whole genome sequencing, and by determining cell markers using flow cytometry.

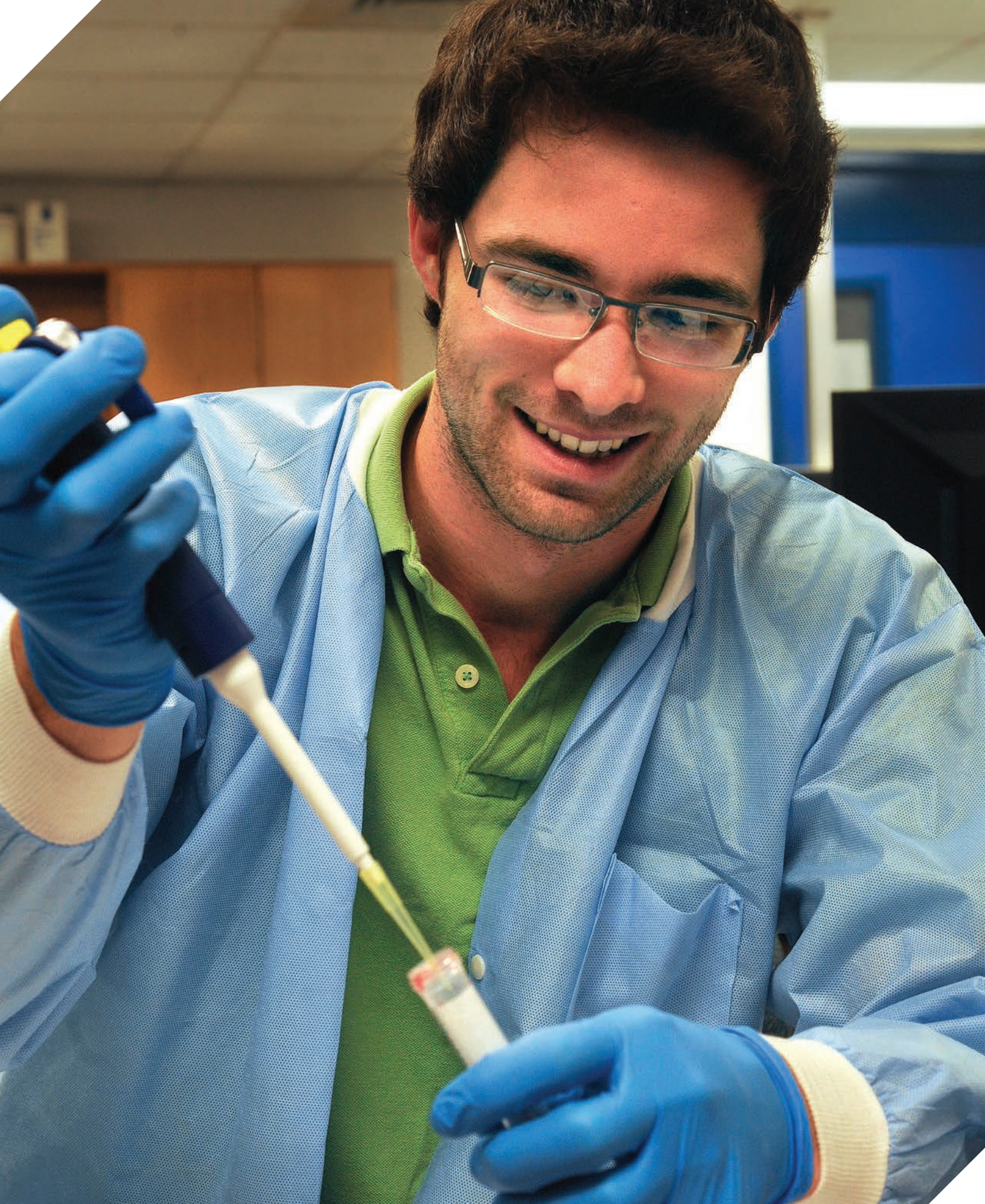
A degree in Clinical Laboratory Sciences is also a springboard for other health professions. Graduates of the program have gone to medical school, physician assistant school, and pharmacy school. The deep knowledge of human physiology and pathophysiology and the ability to interpret medical laboratory tests positions the CLS graduate above the typical pre-professional student applicant.

Laboratory professionals with an associate degree as a Medical Laboratory Technician increase their earning and career potential when they take the next step to the bachelor's degree. The program at UWF has two tracks, the traditional track for students earning their first degree, and the MLT-to-MLS track for students with laboratory experience.

Earning a degree in Clinical Laboratory Sciences will open doors for you into the exciting world of laboratory medicine. I hope that your interest in the clinical laboratory will be stimulated after reading this handbook. The faculty and staff of the Clinical Laboratory Sciences Program at the University of West Florida are eager to assist you in planning for a degree and developing a career in the field.

Best wishes,

Katie Cavnar, MS, MLS (ASCP)
Program Director and Chair
Medical Laboratory Sciences Department



INTRODUCTION

THE PROFESSION

Medical laboratory scientists provide critical information needed for diagnosis, prognosis and management of disease. The work requires exacting precision and accuracy, and it is performed in a fast-paced, highly computerized and technological environment.

Medical laboratory scientists analyze blood, body fluids, tissues and cells. They perform routine to high complexity analysis using chemical, biological, hematological, immunological, microscopic and molecular tests. They are required to have a strong background in biology, chemistry and medicine. Medical laboratory scientists evaluate and interpret test results. In today's laboratories, a medical laboratory scientist is responsible not only for fast and accurate performance of lab tests, but also for quality control, quality assurance, infection control, cost effectiveness, revenue generation and management of human resources. There is a growing

need for well-trained medical laboratory scientists to staff and manage the nation's diagnostic, industrial and research laboratories.

Practice of the profession is regulated by a federal law titled "The Clinical Laboratory Improvement Act" (CLIA) and the laws of the state in which the laboratory is located. Medical laboratory scientists are responsible for the accreditation of the laboratory as well as the laboratory's compliance with state and federal regulations. They often serve as consultants to smaller laboratories and physician office laboratories. National certification as a medical laboratory scientist (MLS) is a highly marketable qualification for employment in a variety of organizations. In Florida, laboratory personnel are required to be licensed by the state and are required to renew their licenses each biennium through documentation of continuing education.

CAREER OPPORTUNITIES

The majority of clinical laboratory professionals work in hospitals. Many others work in healthcare related industries. The biotechnology, environmental, pharmaceutical, and diagnostic products sectors and institutions employ medical laboratory scientists. Medical laboratory professionals also perform tests, supervise and conduct research in environmental, food and chemical manufacturing laboratories. As hospitals merge, opportunities open up for overall management of diagnostic services, including laboratories, medical imaging and pharmacy.

Jobs are available in infection control and organizational quality management. Pharmaceutical companies recruit lab personnel to evaluate drugs. Laboratory professional are finding employment in industry as risk managers, consultants and product information and customer support specialists. Laboratory personnel with an MLT degree increase their career opportunities by earning the BS degree in Clinical Laboratory Sciences.

EMPLOYMENT OPPORTUNITIES FOR MEDICAL LABORATORY SCIENTIST

- Hospital Laboratory
- Reference Laboratory
- Administration
- Physician Office Laboratories (POLs)
- Blood Banks/Transfusion Service Centers
- State and Federal Public Health Labs
- Military and VA Hospitals
- Law Enforcement/Crime Labs
- Toxicology (Drugs of Abuse Testing) Labs
- Food, Water and Environmental Testing Labs
- Biotechnology Product Development
- University and Community College Faculty
- Laboratory Consultants
- Laboratory Information Specialists
- Pharmaceutical Sales and Research
- Diagnostic Products Sales and Research
- State/Federal Law Compliance Officers
- Infection Control Officers
- Quality Assurance Managers
- United States Public Health Service



UWF's PROGRAMS

The BS degree in Clinical Laboratory Sciences is offered by the Medical Laboratory Sciences Department of the Usha Kundu College of Health. The Clinical Laboratory Sciences Program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). It is a registered training program approved by the Department of Health (DOH) of the state of Florida. Graduates of the program are eligible to take the national board certification examination given by the American Society for Clinical Pathology (ASCP-BOC) to be certified as Medical Laboratory Scientists. Graduates are also eligible to be licensed as clinical laboratory technologists in Hematology, Microbiology, Chemistry, Immunohematology, and Serology in the state of Florida. The program offers a continuing education course to prepare graduates with an MLS (ASCP) certification to take the board exam for Molecular Biologist MB (ASCP).

Traditional students are admitted to UWF as pre-CLS majors. During the first 2 years, students take General Studies courses and lower division Biology

and Chemistry prerequisite courses. This is followed by 1 semester of upper division prerequisite courses. The clinical year of the program constitutes the last 5 semesters of study, including summer semesters. The clinical curriculum consists of 3 semesters of MLS Medical Laboratory Sciences courses with labs and finally 2 semesters of MLS hospital internship courses. During the internship phase, students are in attendance Monday through Thursday from 0700 to 1530 daily, and take weekly exams on Friday. The university holds affiliation agreements with over 20 medical laboratories for internships.

Students with an associate degree and certification as a Medical Laboratory Technician qualify for the MLT-to-MLS track. The curriculum covers the same content but takes into account the laboratory experience already held by the Medical Laboratory Technician. Throughout this handbook, differences between the traditional and the MLT-to-MLS track will be highlighted.

Program Outcomes

The traditional face to face MLS program is limited to 40 students. All students are encouraged to take the national board examination offered by the American Society for Clinical Pathology. The most recent program outcomes can be found at uwf.edu/mls. The MLT-to-MLS track start date is 2018. Program outcomes have not been established.

STUDENT OUTCOMES MEASURES					
GRADUATION YEAR	NUMBER OF GRADUATES	GRADUATION RATE	ATTRITION RATE	ASCP NATIONAL BOARD EXAM OVERALL PASS RATE	MEDICAL LABORATORY EMPLOYMENT PLACEMENT RATES W/IN 6 MONTHS OF GRADUATION
2015	26	96%	4%	92%	96%
2016	25	100%	0%	100%	92%
2017	27	96%	4%	85%	96%

PROGRAM MISSIONS AND GOALS

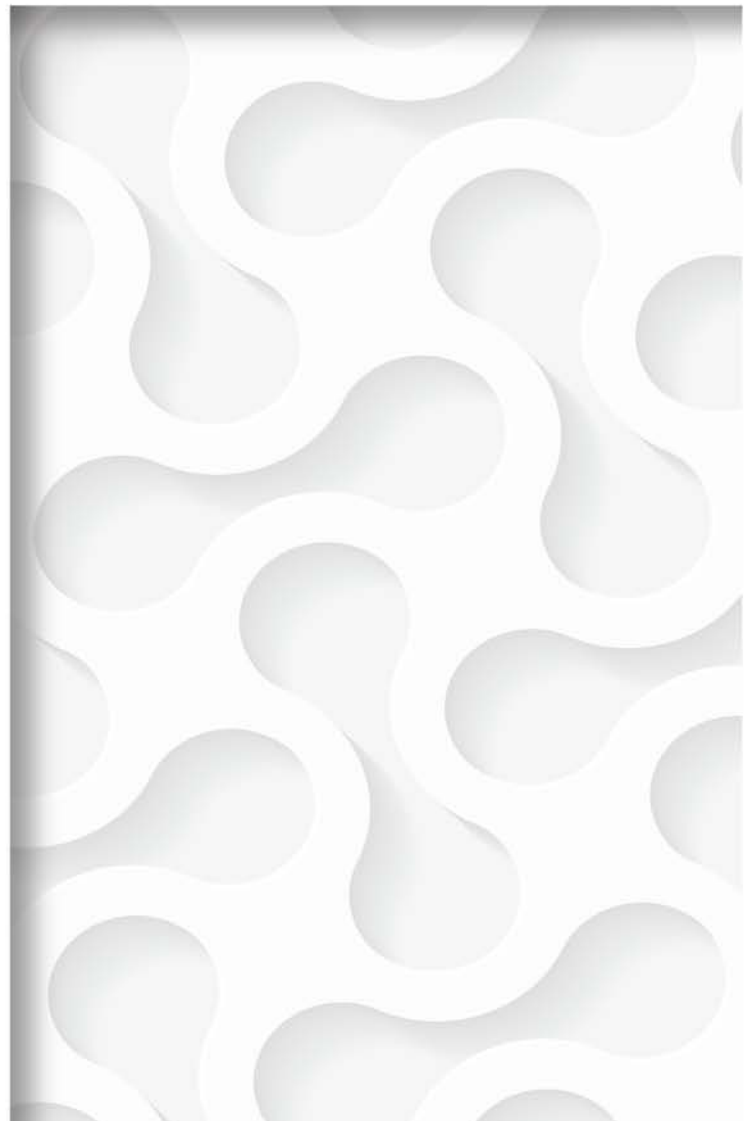
- Maintain a nationally accredited program of excellence and provide a sound educational opportunity for students who seek a career in clinical laboratory sciences and/or biomedical technology.
- Prepare well-educated, highly skilled individuals for the nation's rapidly growing medical and biotechnology laboratories.
- Develop and disseminate up-to-date information regarding educational requirements and career opportunities in clinical laboratory sciences to prospective students and the general public.
- Recruit and retain students with good academic and professional potential.
- Impart the theoretical knowledge and practical skills needed to perform clinical laboratory procedures accurately and efficiently.
- Introduce the student to principles of clinical laboratory supervision, management and education.
- Teach students how to interact well with patients, physicians and other health care professionals in a clinical facility.
- Prepare students for employment in a modern clinical laboratory as medical laboratory scientists.
- Prepare students for national certification exams and state licensure.
- Stimulate students in their quest for knowledge and provide assistance to enter graduate or professional schools.
- Articulate with local and regional community colleges to provide up-to-date information and facilitate academic advisement to prospective majors.
- Maintain partnerships and affiliations with local and regional clinical laboratories to support and enhance student training.
- Contribute to continuing education programs in medical laboratory sciences and serve as a source of academic information to the general public.
- Provide service to the university, to the profession, and to the community through faculty expertise and commitment.
- Meet the hiring needs of medical laboratories in northwest Florida.



CAREER ENTRY LEVEL COMPETENCIES

Upon successful completion of the Clinical Laboratory Sciences Program at the University of West Florida, the graduate will be proficient in performing the full range of clinical laboratory tests in areas such as hematology, coagulation, clinical chemistry, immunohematology, microbiology, serology and immunodiagnostics, molecular and other emerging diagnostics. The graduate will also possess basic knowledge, skills and relevant experience to:

- Develop and establish procedures for collecting, processing, storing, shipping and analyzing specimens in a clinical laboratory.
- Confirm abnormal results, verify quality control procedures, identify possible discrepancies and make decisions regarding alternative courses of action.
- Interpret test results and correlate the results with data generated by other areas of the clinical laboratory.
- Perform quality control methods; analyze and interpret quality control results and take corrective action when needed.
- Perform preventive and corrective maintenance on clinical laboratory instrumentation.
- Prepare, update or revise procedure manuals according to laboratory accreditation standards.
- Evaluate new methods, instruments and reagents in terms of their sensitivity, specificity and cost effectiveness.
- Maintain continuing education as a means of professional development and for maintaining professional competence. Provide leadership in educating laboratory personnel, health professionals and the public.
- Demonstrate professional conduct and interpersonal skills in communicating with laboratory personnel, other health professionals and the public.
- Manage information to enable effective, timely, accurate and cost effective reporting of lab generated information to other health professionals.
- Have and hold responsibility for regulatory compliance with applicable state and federal regulations and accreditation standards.
- Demonstrate an understanding and minimal level of competence in financial, operations, marketing and human resource management of the clinical



ADMISSION TO THE UNIVERSITY

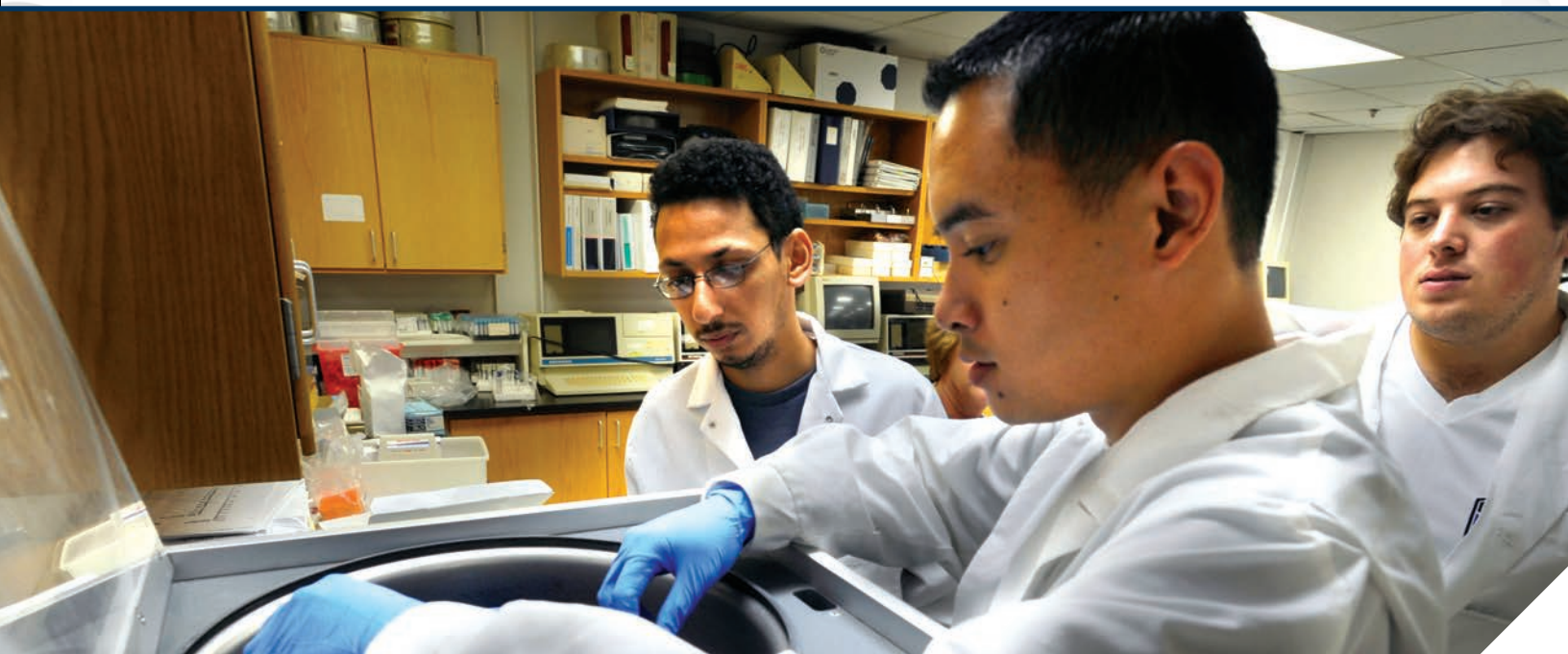
Students are admitted into the university through one of the following routes, and will be classified as a “Clinical Laboratory Sciences Major—not admitted to Clinical Year”:

- A first time in college (FTIC) student may enter as a freshman and declare Clinical Laboratory Sciences as a major.
- A student from a Florida public state college with or without completion of an Associate of Arts degree may transfer and declare Clinical Laboratory Sciences as a major.
- A student from an in-state or out-of-state college or university may transfer and declare Clinical Laboratory Sciences as a major.
- A student who already has completed a bachelor's degree from an accredited college or university may seek admission as a second undergraduate degree-seeking student and declare Clinical Laboratory Sciences as a major. He/she must complete the prerequisite science courses before beginning the clinical year.
- A student with an Associate Degree who is certified as a Medical Laboratory Technician by ASCP may qualify for the MLT to MLS track. He/she must complete the prerequisite science courses before beginning the clinical year. Read the handbook section on the MLT to MLS track for details.

It is strongly recommended that students who plan to enter UWF as transfer students seek academic advisement from the program advisor at least one complete semester prior to the start date at UWF. Students who enter UWF as freshmen even though they are under the advisement of the University Advising Center, should meet with the program advisor in order to ensure the appropriate sequence of coursework and to avoid undue delay in completing the program.

ADMISSION TO THE CLINICAL YEAR

Clinical Laboratory Sciences majors at UWF are required to apply for selection into the clinical year after completion of the prerequisite courses. Selection occurs twice per year, in the spring and summer. The procedure and criteria for clinical year selection are described later in the handbook, and can also be found on the website at uwf.edu/mls.



ACADEMIC LEARNING COMPACT AND MISSION

MISSION STATEMENT

To offer a baccalaureate degree of highest quality in clinical laboratory sciences, enabling the graduate to develop a successful career and/ or to pursue advanced degrees in bio-medical technology fields. To advance knowledge, technology and educational methodologies in clinical laboratory sciences through research and continuing education offerings. To seek and maintain clinical affiliations with local and regional health care institutions; and serve as a source of well qualified personnel for their clinical laboratories. To promote and enhance the prospective student's and public's knowledge regarding the profession of clinical laboratory sciences and the UWF program.

STUDENT LEARNING OUTCOMES

To UWF Clinical Laboratory Science Program graduates should be able to do the following:

CONTENT

- Demonstrate entry-level medical laboratory scientist knowledge of the disciplines within the clinical laboratory, e.g. Hematology, Immunohematology, Microbiology and Clinical Chemistry, which includes principles of the basic sciences that underlie them
- Identify and apply principles of quality assurance in the clinical lab
- Competently perform manual procedures in Hematology, Microbiology, Immunohematology and Clinical Chemistry

CRITICAL THINKING

- Evaluate patient results and distinguish normal from abnormal results
- Conduct research using appropriate sources

COMMUNICATION

- Interact effectively with peers and supervisors
- Generate a capstone medical case study that is formatted for professional presentation or publication

INTEGRITY/VALUES

- Practice appropriate professional standards of behavior, including punctuality, initiative, respect for coworkers and supervisors, confidentiality, and safe laboratory practices
- Adhere to appropriate ethical practices in completing assignments

CURRICULUM REQUIREMENTS

PREREQUISITE COURSES FOR CLINICAL LABORATORY SCIENCES

Traditional and MLT-to-MLS students must complete the following prerequisite courses. Note that the Biology and Chemistry courses build on each other, their sequence is not interchangeable. Students must satisfy the General Studies course requirements specified by UWF to earn the BS degree.

SEMESTER	SEMESTER HOURS
SEMESTER 1	
BSC 2010 General Biology with Lab	4
MAC 1104 College Algebra	3
General studies English Composition I	3
General studies Humanities level I	3
SEMESTER 2	
BSC 1085 Anatomy & Physiology I with Lab	4
CHM 2045 General (College) Chemistry I with lab	4
General studies English Composition II	3
General studies Humanities level II	3
Foreign language I*	3
SEMESTER 3	
BSC 1086 Anatomy & Physiology II with Lab	4
CHM 2046 General (College) Chemistry II with lab	4
STA 2023 Statistics	3
General studies Social Sciences level I	3
SEMESTER 3	
CHM 2210 Organic Chemistry I with lab	4
MCB 2010 OR 3020 General Microbiology with lab	4
General studies Social Sciences level II	3
General studies Social Sciences or Humanities level I or II	3
Foreign language II*	
SEMESTER 5	
CHM 2211 Organic Chemistry II with lab	4
PCB 3063C Genetics with lab (or MLS 3194 Clinical Genetics online)	4
BCH 3033 Biochemistry with lab (or MLS 3621 Clinical Biochemistry online)	4
HSC 3555 Pathophysiology	3

*Foreign language requirement: 2 semesters in college, or 2 years in high school of the same language

MULTICULTURAL REQUIREMENT

An important component of a liberal education is the study of cultures other than one's own. As such, multiculturalism encompasses the appreciation of the values, expressions, and modes of organization of diverse cultural communities. The University of West Florida requires all students pursuing a bachelor's degree to complete at least one course that explores one or more of the dimensions of another culture (language, religion, socio-economic structures, etc.). Students are exempt from this requirement if they have completed an A.A. degree at a Florida public institution, or a baccalaureate degree. General studies courses at UWF are designated as multicultural if they fulfill this requirement.

GORDON RULE REQUIREMENT

The Gordon Rule, Florida Statutes requires students to fulfill certain writing and mathematics requirements. This includes six semester hours of English coursework and six semester hours of additional coursework in which students are required to demonstrate college-level writing skills through multiple assignments. In addition, six semester hours of mathematics at the level of college algebra or higher are required. General studies courses at UWF are designated as Gordon Rule if they fulfill this requirement.

Gordon Rule requirements are fulfilled in the MLT to MLS degree plan by taking six semester hours of English composition and three semester hours of a General Studies course that is specified as a Gordon Rule course. The MLS course Clinical Management Portfolio for MLT-to-MLS qualifies as a Gordon Rule course. Students should consult the Office of Undergraduate Admissions for evaluation of transfer courses for General Studies requirements, Gordon Rule, and the multicultural requirement.

CIVICS LITERACY REQUIREMENT

Baccalaureate degree-seeking students initially entering a state university fall semester 2018 and thereafter must demonstrate competency in civic literacy through one of the following options prior to graduation:

1. Successfully passing either POSX041 American Government or AMHX020 Introductory Survey Since 1877. Each of the courses must include the following competencies:
 - i. Understanding of the basic principles and practices of American democracy and how they are applied in our republican form of government;
 - ii. An understanding of the United States Constitution and its application;
 - iii. Knowledge of the founding documents and how they have shaped the nature and functions of our institutions of self-government; and
 - iv. An understanding of landmark Supreme Court cases, landmark legislation and landmark executive actions and their impact on law and society.
2. Achieving the standard score on one of the following assessments:

Assessment	Standard Score
U.S. Citizenship and Immigration Services Naturalization Test	60
Advanced Placement Government and Politics: United States	3
Advanced Placement United States History	4
CLEP American Government	50

TRADITIONAL CLINICAL LABORATORY SCIENCES CLINICAL YEAR CURRICULUM

The clinical year consists of 55 credits of Medical Laboratory Sciences courses offered over 5 semesters. Courses are only offered once per year, with rolling admission and start date. Students must maintain a 2.5 GPA to remain in the program.

Course SEMESTER HOURS

SPRING	
MLS 4305 Hematology and lab	4
MLS 4460 Diagnostic Microbiology and lab	4
MLS 4505 Clinical Immunology and lab	4

SUMMER	
MLS 4334 Hemostasis & Thrombosis and lab	2
MLS 4220 Urinalysis & Body Fluids I and lab	2
MLS 4625 Clinical Chemistry I and lab	3
MLS 4462 Medical Microbiology and lab	4

FALL	
MLS 4191 Molecular Diagnostics and lab	4
MLS 4630 Clinical Chemistry II and lab	3
MLS 4550 Immunochemistry and lab	4
MLS 4705 Special Clinical Topics	1

Major courses at hospital internship:

SEMESTER 1	
MLS 4820L Clinical Chemistry III	4
MLS 4821L Diagnostic Microbiology II	4
MLS 4822L Hematology II	4

SEMESTER 2	
MLS 4823L Immunochemistry II	4
MLS 4824L Special Clinical Methods	2
MLS 4825L Urinalysis & Body Fluids II	2

MLT-to-MLS CLINICAL YEAR CURRICULUM

Students who hold an associate's degree and are certified as a Medical Laboratory Technician qualify for this track. The clinical year consists of 35 credits of Medical Laboratory Sciences courses offered over 3 semesters. Courses are only offered once per year with rolling admission and start date. Students may opt to take 2 years to complete the curriculum. All courses are online. Students must maintain a 2.5 GPA to remain in the program.

COURSE

SEMESTER HOURS

SPRING	
MLS 4306C Hematology for the MLT to MLS track	4
MLS 4461C Diagnostic Microbiology for the MLT to MLS track	4
MLS 4506C Clinical Immunology for the MLT to MLS track	4

SUMMER	
MLS 4335C Hemostasis & Thrombosis for the MLT to MLS track	3
MLS 4221C Urinalysis & Body Fluids for the MLT to MLS track	3
MLS 4626C Clinical Chemistry I for the MLT to MLS track	3
MLS 4463C Medical Microbiology for the MLT to MLS track	4

FALL	
MLS 4193C Molecular Diagnostics for the MLT to MLS track	4
MLS 4631C Clinical Chemistry II for the MLT to MLS track	3
MLS 4552C Immunohematology for the MLT to MLS track	4
MLS 4931 Clinical Management Portfolio for the MLT to MLS track	3

Major related courses:

SEMESTER 1	
MLS 3194 Clinical Genetics	3
MLS 3621 Clinical Biochemistry	3
HSC 3555 Pathophysiology	3

Students must complete sufficient 3000/4000 level electives to meet UWF's requirement of 48 semester hours in the upper division or complete all departmental requirements at the 3000/4000 level, whichever is greater.

Students in this track must complete an online Review Week training prior to graduation.

Some US states have special training requirements. Students seeking licensure in California and New York may need to complete additional training hours and additional science courses to comply with state license requirements.

TRANSFER STUDENTS

Many traditional CLS majors transfer into the program. All transfer students must satisfy the graduation requirements set forth by the University of West Florida. Departmental advisors are available to design a unique degree plan to accommodate past coursework.

1. Students transferring from Florida public colleges and universities.

- Students who have received an Associate of Arts (AA) degree from a Florida public college have already fulfilled the general education requirements. They are admitted to UWF as juniors in the Clinical Laboratory Sciences Program. If they have taken the common prerequisite science courses, these will automatically transfer in. Florida public colleges have a common course numbering system. Students can verify the correct course number for the science and math courses at the departmental website, <https://uwf.edu/coh/departments/medical-laboratory-sciences/information/transfer-students>.
- Applicants who do not have an AA degree or did not complete the general studies requirements must complete their General Studies courses prior to graduation.

2. Students transferring from out of state colleges and universities

- Students who transfer from out of state colleges and universities are subject to the UWF General Studies requirements. They must have completed the prerequisite science courses or plan to take them at UWF.

3. Students with a previously earned bachelor's degree

- Individuals with a bachelor's degree from an accredited college or university may be eligible for selection into the clinical year of the Clinical Laboratory Sciences program if they have completed or are currently enrolled in the prerequisite courses. Equivalent coursework from another university will be accepted for prerequisites. MLS courses from other institutions will not be accepted.
- Students from outside Pensacola who are deficient in the prerequisites may complete them at a local college. It is advisable to work with the departmental advisor to be sure of the correct courses.

All transfer students must be admitted to the University of West Florida declaring Clinical Laboratory Sciences as their major. Applications are done online at uwf.edu/admissions. The application includes providing proof of Florida residency and immunization records, providing official transcripts and their evaluation by the Admissions Office. The process takes 6-8 weeks. The student should apply early one semester before the anticipated UWF start date, and correspond with the departmental advisor.

SCIENCE AND MATH PREREQUISITIES

- MBSC 2010 Biology I/Lab
- BSC 1085 Anatomy & Physiology I/Lab
- BSC 1086 Anatomy & Physiology II/Lab
- STA 2023 Elements of Statistics
- CHM 2045 General Chemistry I/Lab
- CHM 2046 General Chemistry II/Lab
- CHM 2210 Organic Chemistry I/Lab
- CHM 2210 Organic Chemistry I/Lab
- PCB 3063C Genetics*
- BCH 3033 Biochemistry*
- HSC 3555 Pathophysiology
- MCB 2010 or 3020 General Microbiology/Lab

**MLT to MLS students can take MLS Clinical Genetics and Clinical Biochemistry*

ADMISSION TO THE CLINICAL YEAR FOR TRADITIONAL STUDENTS

POLICIES AND PROCEDURES

- The clinical year of the traditional Clinical Laboratory Sciences Program has limited access. Enrollment is limited to 40 students per year. Two cohorts are selected each year, during the spring and summer semesters.
- Admission into the University as a Clinical Laboratory Sciences major does not guarantee selection into the clinical year.
- Students should apply for entry into the clinical year during the Spring semester in which they are taking Hematology I and Diagnostic Microbiology I. Alternately they can apply during the summer semester when they are taking Hemostasis & Thrombosis and Medical Microbiology
- Eligibility is limited to those students who have completed all of the prerequisite courses with a minimum GPA of 2.8. A student with a GPA between 2.5-2.8 will only be considered if showing excellence in other criteria and if space is available.
- Eligible students are required to submit an online application, and three letters of recommendation to the Program Director, to be considered for selection into the clinical year. Deadlines for submission will be announced at student orientation. Evaluations are electronic and will be provided to students during orientation.
- Applications are reviewed by a selection committee composed of University faculty and education coordinators from affiliate hospitals.
- Student selection is based on evaluation of the application form and references, completion of prerequisites courses, GPA, other merit recognition, and an interview with the selection committee.
- The spring student selections are completed by April 1 and the clinical year begins during the first week of May. The summer student selections are completed by July 1 and the clinical year begins during the first week of August.
- Students not selected may complete a B.S. degree in Biology or Biomedical Sciences and reapply for clinical year selection the following year.



CRITERIA FOR SELECTION

INTERVIEW:

- Appearance and poise
- Speech, communication and self expression skills
- Motivation—rationale for wanting to be a Medical Laboratory Scientist
- Professional knowledge
- Extracurricular activities
- Future goals and objectives
- Reaction under stress/ability to handle pressure
- Leadership potential
- Self-assessment—potential versus performance
- Understanding of health professions— patient welfare, confidentiality, critical nature of accuracy

EXPERIENCE & AWARDS:

- Work experience
- Scholarships and merit awards
- Other degrees, diplomas, certifications, licensure, etc.

GPA	RANK	POINTS
3.5 – 4.0	Outstanding/Excellent	5
3.0 – 3.5	Very Good/Above Average	4
2.8 – 3.0	Good/Average	3
2.5 – 2.7*	Needs improvement	0

** Students with a GPA between 2.5 and 2.7 may be considered for admission under special circumstances and/or exceptional performance in the interview, based on the availability of space and special consideration by the selection committee. A two year track record of success will speak favorably for the candidate*

RECOMMENDATION LETTERS:

Students must submit three recommendation evaluation letters, two from college professors and one from a personal source, such as an employer, supervisor in volunteer work setting, etc. Students are rated on a scale of 1-5 based on the recommendations.

Selection is based on the student's academic record, other evidence of merit and potential to become a competent Medical Laboratory Scientist. The University of West Florida is an equal opportunity institution. Qualified applicants are selected regardless of gender, culture, race, religion, ethnic background, age, marital status, or disability unrelated to job requirements.



ADMISSION TO THE CLINICAL YEAR FOR MLT-to-MLS STUDENTS

Medical Laboratory Technicians with an Associate's degree who are credentialed by the American Society for Clinical Pathology are encouraged to apply for the MLT to MLS program. Applicants with sufficient clinical internship training who meet the acceptance criteria can complete the degree online.

ADMISSION REQUIREMENTS

Applicants must meet the general admission criteria and be admitted to UWF. Students in the MLT to MLS degree must meet the following requirements at the time of application:

- Associate of Science in Medical Laboratory Technology degree from a community college to include the prerequisites of the program and fulfillment of the general studies courses
or
- Military training as a Medical Laboratory Technician and an Associate of Arts degree to include the prerequisites of the program and general studies courses
- Minimum overall GPA of 2.5 on 4.0 scale
- Certification as an MLT by ASCP or AMT
- Submission of a departmental application by the published deadline (see website for deadline and online application)
- If requested, satisfactory completion of Level 2 criminal background check and drug screen through the selected provider
- Recommendation letters as requested
- Phone interview with selection committee

The clinical year consists of 12 courses, shown in the degree plan. Courses are offered once per year. Students may join in any semester. Graduating students must participate in "Review Week", an intense, focused review of all the MLS courses as preparation for the ASCP board examination. Students may take the upper division prerequisite courses Clinical Genetics, Clinical Biochemistry and Pathophysiology online through UWF, or they can substitute upper division Biochemistry and Genetics from another institution. MLS courses taken at another institution will not be accepted as transfer credit.



ESSENTIAL FUNCTIONS

Applicants to the Medical Technology Program must read the following Essential Function Standards for Medical Technology. The following standards provide an overview of the requirements of the course of study. The examples of activities are based upon typical tasks performed by medical laboratory workers. At the time of selection into the clinical year the students will be asked to complete a Statement of Essential Functions, indicating any disabilities which may require special accommodations.

FUNCTION	STANDARD	EXAMPLE ACTIVITY
Communication	Ability to interact with others in English, both verbally and in legible written form. Ability to read English.	Keep accurate records. Read and write procedures. Read and follow instructions in manufacturers' inserts. Explain procedures and results to patients, health care providers, co-workers.
Hearing	Ability to gather information aurally or to adapt.	Recognize instrument signals, alarms. Use telephone.
Interaction	Ability to interact with individuals or groups from a range of social, cultural, emotional and intellectual backgrounds.	Establish and maintain rapport and trust with patients, co-workers and other health care professionals
Mobility	Ability to move from room to room, and to maneuver in small places, e.g., around instruments, between beds, benches, etc.	Move around hallways, laboratory, patient room, storage areas as necessary.
Motor Skills	Demonstrate/possess gross and fine motor skills to operate dials, switches, pipetting devices; smoothly inoculate agar, and to assist patients.	Reach and manipulate equipment, reagents and supplies. Assist patients as necessary.
Self Care	Ability to present a professional appearance as a lab representative. Maintain own health and safety on the job.	Observe safety/OSHA policies. Practice universal precautions.
Olfaction	Demonstrate sufficient olfactory sense to maintain patients' environmental safety.	Use odors to assess specimens, tests, instrument malfunction and smoke in case of fire. Maintain a safe environment.
Temperament	Ability to work in high stress workplace environment.	Perform duties in emergency situations; with sick patients; in situations with time and manpower constraints.
Vision	Ability to accurately perform and assess laboratory and patient procedures.	Distinguish colors and opacity. Discern fine agglutination or precipitation. Resolve 1 micron objects using a bright field microscope. Identify cells, parasites and other elements in microscope procedures for diagnosis.



SPECIAL REQUIREMENTS FOR STUDENTS IN THE TRADITIONAL TRACK

HEALTH AND IMMUNIZATION STATUS REQUIREMENTS

During the semester prior to the start of the clinical internship, students are required to submit a "Status of Health and Immunization Form" signed by their physician or the UWF Health Center. Students must provide proof of immunity (by positive titer) or proof of vaccination for Rubella, Mumps, Measles, Chicken Pox and Hepatitis B. Students must have proof of a recent flu shot. A TB skin test is required, and must be taken within three months of beginning the clinical rotations. The program works with the UWF Student Health Center to facilitate immunizations. Students are required to provide proof of health insurance coverage in order to participate in the internship. Students are also required to have a physical, which may be provided by the Health Center. There are charges associated with the physical and immunizations. To view the current costs, go to uwf.edu/healthcenter.

SPECIAL CLINICAL AFFILIATE REQUIREMENTS

Clinical Affiliates reserve the right to re-test students for drugs of abuse, to perform additional background checks, or require fingerprinting. Students may be refused admission to clinical rotations based on these results.

BACKGROUND INVESTIGATION AND DRUG SCREEN

Students are required to submit to a background investigation report during the semester prior to the clinical internship. A clear background check, with no criminal record or evidence of discrepancies between statements made on the application and the verified information, is a condition for selection into the clinical year. Students are required to submit to a urine drug screen. The cost of the background check and drug screen is borne by the student, and is approximately \$115.

TRAINEE LICENSE

The Florida Department of Health requires all students to obtain a Clinical Laboratory Personnel Trainee license prior to starting the hospital training phase. The cost is \$45.

FINAL REVIEW WEEK

During the final week of the internship, students return to the university for one week of intense review and examinations in preparation for the national certification exam. Upon graduation, students awarded a B.S. degree in Clinical Laboratory Sciences are eligible to take the ASCP Board of Certification examination. Passing the board allows the graduate to bear the credential of Medical Laboratory Scientist, written as MLS (ASCP). Passing the national examination is a requirement for state licensure in Florida; however, it is not a condition for earning a degree in Clinical Laboratory Sciences.



CLINICAL YEAR CURRICULUM

Selected students complete the course work listed below over a period of five semesters. MLS courses are only offered once per year. Students may initiate the sequence in the spring or the summer.

University-Based Courses

SPRING SEMESTER		SH	FALL SEMESTER		SH
MLS 4305	Hematology I/Lab	4	MLS 4630	Clinical Chemistry II/Lab	3
MLS 4460	Diagnostic Microbiology I/Lab	4	MLS 4550	Immunohematology I/Lab	4
SUMMER SEMESTER			MLS 4505	Serology /Lab	2
MLS 4625	Clinical Chemistry I/Lab	3	MLS 4191	Molecular Diagnostics/Lab	2
MLS 4334	Hemostasis & Thrombosis/Lab	2	MLS 4705	Special Clinical Topics	1
MLS 4220	Urinalysis and Body Fluids I/Lab	2			
MLS 4462	Medical Microbiology	4			

Students must maintain a minimum grade of "C" in each of the above courses in order to proceed to the hospital laboratory courses.

Hospital-Based Courses

In January or in May, upon successful completion of the above courses, students will be placed in individual clinical rotations at one of the university's clinical affiliates. Hospital training is 29 weeks long, including one week break midway through the rotation. Students are required to attend 32 hours per week, Monday through Thursday, and to attend the university on Friday for a weekly examination. Clinical rotations are divided into the units listed below. Each rotation corresponds to the university course shown in the table below. The two semester sequence is 20 semester hours.

HOSPITAL ROTATION	# OF WEEKS	EQUIVALENT UNIVERSITY COURSE	SH
Microbiology	5	MLS 4821L Diagnostic Microbiology II	4
Hematology & Coagulation	5	MLS 4822L Hematology II	4
Clinical Chemistry	4	MLS 4820L Clinical Chemistry III	4
Special Chemistry, TB & Mycology	3	MLS 4824L Special Clinical Methods	2
Immunohematology & Serology	7	MLS 4823L Immunohematology II	4
Urinalysis, Parasitology & Phlebotomy	3	MLS 4825L Urinalysis & Body Fluids II	2
Miscellaneous & Make up	1		
Break	1		
	29		20

ADMISSION TO THE CLINICAL YEAR FOR MLT-to-MLS STUDENTS

Students should refer to the current UWF catalog at uwf.edu/catalog for tuition, fees, housing costs and other expenses common to all university students. In addition, Clinical Laboratory Sciences students in the traditional track have special costs during the clinical year of the program. These costs were accurate in 2018, but they are subject to change from year to year. The UWF Health Center provides most of the testing. See <https://uwf.edu/offices/student-health-services/> for most recent costs. An updated cost sheet will be provided to the student at the time of selection into the clinical year.

The entire curriculum is divided into five terms, labeled as 1-5. The cost is associated with the term in which it will be incurred.

DURING UNIVERSITY PHASE

ITEM	APPROXIMATE COST	TERM THE COST IS DUE
Background Check & Drug Screen	\$115	Term 3
Physical Exam	\$15	Term 3
Hepatitis B Immunization Series	\$165	Term 2 and 3
TB Skin Test	\$8	Term 3
State of Florida Trainee License & Transcripts	\$55	Term 3
Flu Vaccine	\$19	Term 3

DURING UNIVERSITY PHASE

ITEM	APPROXIMATE COST	TERM THE COST IS DUE
Health Insurance	variable	Term 4 and 5
ASCP Certification Exam	\$240	Term 5
Transcript Request	\$20	Term 5
Florida License Application	\$100	Term 5



HOSPITAL CLINICAL ROTATION

SAMPLE ROTATION SCHEDULE

8 HOUR/DAY MONDAY - THURSDAY, EXAM ON FRIDAY					
WEEK	DATE	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4
1	1-03-xx	Phlebotomy	Phlebotomy	Phlebotomy	Phlebotomy
2	1-10-xx	Microbiology 1	Blood Bank 1	Chemistry 1	Hematology 1
3	1-17-xx	2	2	2	2
4	1-25-xx	3	3	3	3
5	2-01-xx	4	4	4	4
6	2-08-xx	5	5	Coagulation	Blood Bank 1
7	2-15-xx	6	Microbiology 1	Hematology 1	2
8	2-22-xx	7	2	2	3
9	3-01-xx	Chemistry 1	3	3	4
10	3-08-xx	2	4	4	5
11	3-15-xx	3	5	Special Chem 1	Coagulation
12	3-22-xx	4	6	Special Chem 2	Serology 1
13	3-29-xx	Spring Break	Spring Break	Spring Break	Spring Break
14	4-05-xx	Hematology 1	7	Microbiology 1	Serology 2
15	4-12-xx	2	Chemistry 1	2	Chemistry 1
16	4-19-xx	3	2	3	2
17	4-26-xx	4	3	4	3
18	5-03-xx	Serology 1	4	5	4
19	5-10-xx	Serology 2	Urinalysis/BF	6	Urinalysis
20	5-17-xx	Special Chem 1	Hematology 1	7	Special Chem 1
21	5-24-xx	Special Chem 2	2	Blood Bank 1	Special Chem 2
22	5-31-xx	Coagulation	3	2	Microbiology 1
23	6-07-xx	Urinalysis	4	3	2
24	6-14-xx	Blood Bank 1	Serology 1	4	3
25	6-21-xx	2	Serology 2	5	4
26	6-28-xx	3	Coagulation	Urinalysis	5
27	7-05-xx	4	Special Chem 1	Serology 1	6
28	7-12-xx	5	Special Chem 2	Serology 2	7
29	7-18-xx	Miscellaneous/Makeup Week at the Hospital			
30	7-25-xx	Review Week on Campus			

GRADUATION

To qualify for graduation with a B.S. Degree in Clinical Laboratory Sciences, students must have earned at least 126 total semester hour credits, fulfilling the course requirements listed in the previous pages. A breakdown of the credit is as follows:

UWF Lower Division or Junior College Transfer	60 SH
UWF Upper Division, Non-Major	15 SH
MAJOR	
UWF Upper Division, Major, University-Based Courses	31 SH
UWF Upper Division, Hospital-Based Courses	20 SH

The UWF program has rolling admission, therefore students may graduate in May, August or in December. Applications for graduation must be filed online no later than first week of classes two semesters prior to graduation.

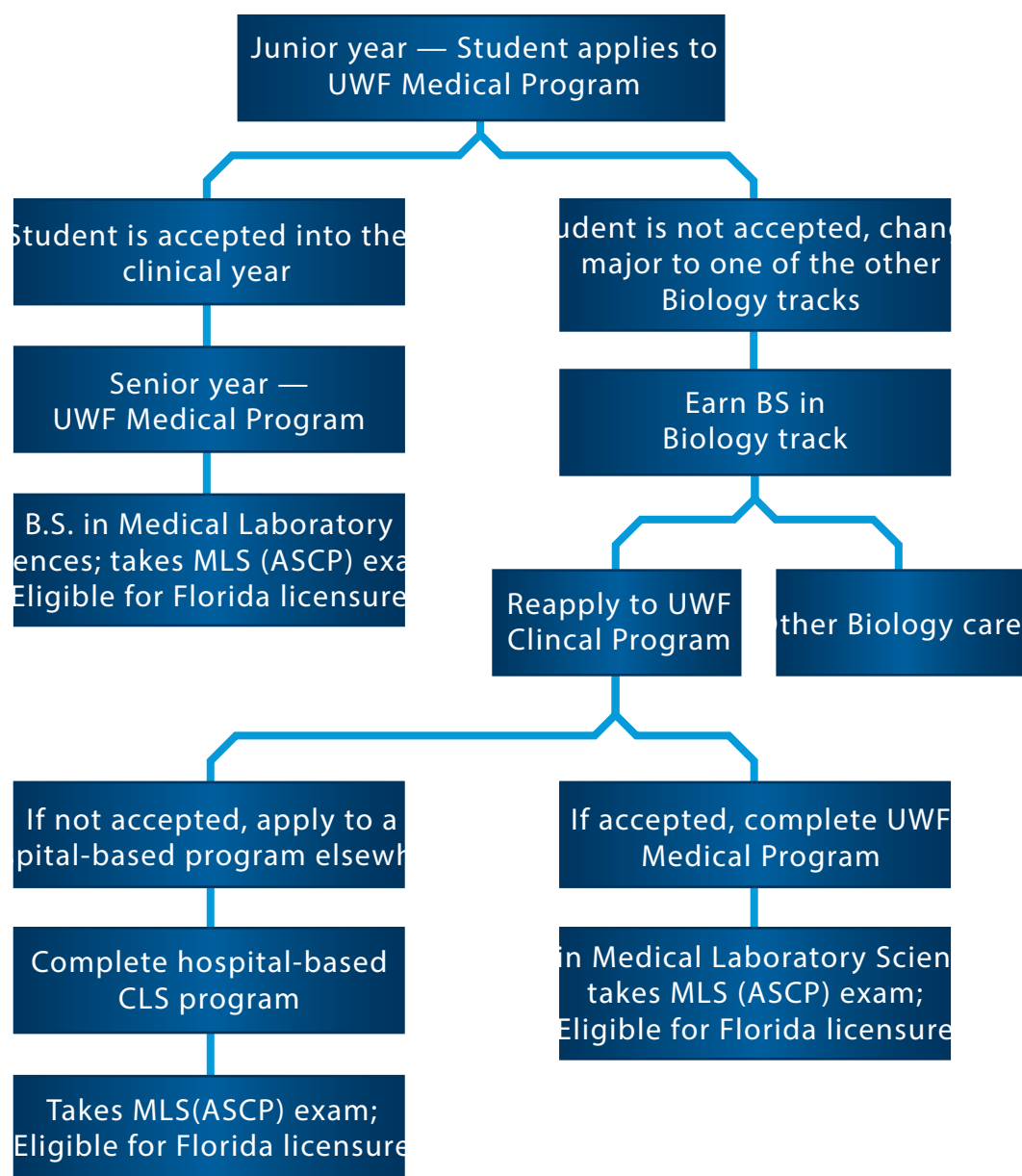
The university has two graduation ceremonies, one in May and one in December. Students who graduate in August may choose to march in the May commencement ceremony. Students should bookmark the webpage uwf.edu/commencement and follow instructions to order their cap and gown.

By tradition graduating CLS students are recognized at a departmental ceremony during the first week of August each year. Upon submission of an application for graduation and the department's approval, the student will be awarded a B.S. Degree in Clinical Laboratory Sciences. Granting of the degree is not contingent upon the student's passing an external certification examination.



ALTERNATIVES FOR STUDENTS NOT SELECTED INTO THE CLINICAL YEAR

Selection into the clinical year of Medical Laboratory Sciences Program is limited to 40 students per year. While we are usually able to select all qualified students, occasionally the applicant pool may be larger than 40. In such cases, some students who meet the minimum entry requirements may not be selected for the ensuing year of clinical laboratory training. The following is a flow chart showing alternatives available for students who are not selected.



PROGRAM POLICIES, RULES AND REGULATIONS

CODE OF ETHICS

PREAMBLE

The Code of Ethics of the American Society for Clinical Laboratory Science (ASCLS) sets forth the principles and standards by which clinical laboratory professionals practice their profession.

DUTY TO PATIENT

Clinical laboratory professionals are accountable for the quality and integrity of the laboratory services they provide. This obligation includes maintaining individual competence in judgment and performance and striving to safeguard the patient from incompetent or illegal practice by others.

Clinical laboratory professionals maintain high standards of practice. They exercise sound judgment in establishing, performing, and evaluating laboratory testing.

Clinical laboratory professionals maintain strict confidentiality of patient information and test results. They safeguard the dignity and privacy of patients and provide accurate information to other health care professions about the services they provide.

DUTY TO COLLEAGUES AND THE PROFESSION

Clinical laboratory professionals uphold and maintain the dignity and respect of our profession and strive to maintain a reputation of honesty, integrity, and reliability. They contribute to the advancement of the profession by enhancing the body of knowledge, adopting scientific advances that benefit the patient, maintaining high standards of practice and education, and seeking fair socioeconomic working conditions for members of the profession.

Clinical laboratory professionals actively strive to establish cooperative and respectful relationships with other health professionals with the primary purpose of ensuring a high standard of care for the patients they serve.

DUTY TO SOCIETY

As practitioners of an autonomous profession, clinical laboratory professionals have the responsibility to contribute from their sphere of professional competence to the general well-being of the community.

Clinical laboratory professionals comply with relevant laws and regulations pertaining to the practice of clinical laboratory science and actively seek, within the dictates of their consciences, to change those which do not meet the high standards of care and practice to which the profession is committed.



ACADEMIC POLICIES

Students should refer to the UWF Student Handbook for matters common to all university students. The following policies pertain to Medical Laboratory Sciences Program majors who have been admitted to the clinical year.

During the clinical year the course of study constitutes eight months of medical laboratory course work at the university, followed by seven months of clinical (practicum) rotations at one of our affiliate hospitals. The following policies are established and enforced to promote the professional growth and development of a CLS student. Students are required to adhere to these policies both in the university courses as well as in the clinical rotations at the hospitals. Periodic and final evaluations of a student's performance in each course or clinical rotation are used for advisement, assistance and encouragement throughout the clinical year course work.

- Medical laboratory science courses require special permission by the Program Director or academic advisor for registration. Students should meet with their advisor at least twice during the semester, more frequently if having academic or personal problems.
 - Each semester students are required to register for a prescribed set of courses. The clinical year curriculum has a lockstep process with no provision for electives or variations in course sequence.
 - The grade earned at the end of each course, including hospital-based courses, is a letter grade based on the average on points earned in written exams, laboratory unknowns, practical exams, quizzes, seminars and special assignments.
 - Students are required to earn a minimum grade of "C" in each clinical course in order to successfully complete the program. Students who fail to obtain a minimum of a "C" in a given course are required to repeat that course.
- Since clinical courses are offered only in one semester/year, having to repeat a course will delay graduation by at least one whole year; which in turn will delay board certification, state licensure and entry into the job market. Failure in a clinical rotation (hospital-based course) will have the same effect, however there is no guarantee that the student will be able to repeat a clinical rotation. Based on the student's performance, the clinical site may refuse to allow the student to repeat the rotation.

- Students are required to buy and use all the textbooks and/or manuals for each course.
- Students are required to attend all classes and clinical rotation assignments. They should study lecture and laboratory objectives ahead of time and be prepared for effective utilization of time during class periods or clinical rotations.
- Except in emergency or pre-approved situations, makeup sessions will not be provided for missed classes and exams. It is the student's responsibility to explain and request assistance in the event of unavoidable absence(s).
- Given adequate notice, students are required to attend continuing education programs and student seminars at other hospitals as scheduled.
- Academic cheating will result in dismissal from the program.
- Full-time students are advised to limit outside employment to no more than 10-15 hours per week. If possible, students are encouraged to seek employment in a health care facility in order to gain experience and understanding of a health care environment.

PROFESSIONAL POLICIES

- Students should take pride in their personal appearance and dress neatly and professionally while at work or in class. They should comply with the dress code rules and regulations of the University as well as the hospital laboratory.
- While at the hospital, the student is under the direct supervision of a clinical instructor. Students should learn, work and report results under the guidance of the assigned instructor.
- Information concerning patients, including the clinical history, diagnosis, laboratory test results, and treatment must be treated as privileged information and must not be discussed in an inappropriate or unauthorized setting. Information about the hospital or its residents must not be shared on the internet.
- Utmost concentration, care and accuracy of results should be maintained while performing and/or reporting results. Frequent and/or repetitive errors will be cause for review and dismissal from the program.
- Inability to comprehend principles of laboratory practice and failure to achieve competency even after repeated instruction, and within a reasonable period of time, may result in dismissal.
- Attendance and punctuality are absolutely essential and will be strictly enforced.
- Eating, drinking, smoking, chewing gum, and related activities are prohibited in the classroom at the University as well as in the hospital laboratory.
- Alcoholic beverages must not be consumed prior to classes or during clinical rotations.
- Students are prohibited from using rude or abusive language to patients, staff and the public.
- Lab safety rules must be followed without exception. Conduct which may endanger the students or others will result in dismissal.
- Students should always consult the supervising technologist when in doubt. They are at no time permitted to release lab results without the knowledge and approval of the clinical instructor.
- The student's main objective is to master the techniques so as to perform them with minimal supervision. Responsibility for presenting each technique to the student in a systematic manner rests with the technologist in charge of the instruction. Ultimate responsibility for maximizing the opportunity to observe, learn, perform, and become an independent technologist rests with the student.

UWF POLICIES

EXPECTATIONS FOR ACADEMIC CONDUCT/PLAGIARISM

As members of the University of West Florida, we commit ourselves to honesty. As we strive for excellence in performance, integrity – personal and institutional – is our most precious asset. Honesty in our academic work is vital, and we will not knowingly act in ways which erode that integrity. Accordingly, we pledge not to cheat, nor to tolerate cheating, nor to plagiarize the work of others. We pledge to share community resources in ways that are responsible and that comply with established policies of fairness. Cooperation and competition are means to high achievement and are encouraged. Indeed, cooperation is expected unless our directive is to individual performance. We will compete constructively and professionally for the purpose of stimulating high performance standards. Finally, we accept adherence to this set of expectations for academic conduct as a condition of membership in the UWF academic community. (From the Student Life Handbook)

ASSISTANCE FOR STUDENTS WITH DISABILITIES

The University of West Florida supports an inclusive learning environment for all students. If there are aspects of the instruction or design of courses that hinder your full participation, such as time-limited exams, reasonable accommodations can be arranged. Prior to receiving accommodations, you must register with the Student Accessibility Resources (SAR). Appropriate academic accommodations will be determined based on the documented needs of the individual. For information regarding the registration process, e-mail sar@uwf.edu or call 850.474.2387.

Students with disabilities unrelated to the essential functions required of a medical laboratory scientist will be evaluated and selected into the clinical year based on the selection criteria applied to all applicants. Selected students with disabilities unrelated to the essential functions will be provided with reasonable accommodations to facilitate their learning and to achieve the expected student learning outcomes, as established in the Academic Learning Compact of the program.

DISCIPLINARY ACTIONS AND APPEALS

The following reasons constitute grounds for dismissal from the program:

- Repeated failure to make required minimum grades in clinical course work.
- Failure to achieve entry level job competencies in laboratory work.
- Academic cheating and/or dishonesty in performing laboratory work, i.e., altering lab results or reporting results on tests not done.
- Repeated violations of lab safety rules.
- Noncompliance with established rules of the Program, the University, or the Hospital.

Students who miss scheduled classes or clinical rotations for more than three weeks due to prolonged health problems or personal reasons will be asked to withdraw from the program and apply for re-entry at a later date. Only those students in good academic and professional standing at the time of discontinuation will be considered for re-admittance into the program.

In the event of a pending dismissal or involuntary withdrawal from the program, the issue will be reviewed by an ad hoc committee made up of program officials from the University and the clinical affiliates. The committee will review the facts, meet with the student in an open meeting, and make a recommendation to the Program Director to take appropriate action.

APPEAL INFORMATION

For information of sanctions and procedures for violations of UWF's academic or non-academic conduct codes, students should refer to the UWF Student Handbook (Student Life). While a student is at the University, those procedures will be followed in the event of an alleged violation.

During hospital laboratory rotations students should follow appropriate procedures to appeal grade conflicts or for finding a solution for other problems encountered. The following procedures are strongly recommended.

- Bring the problem to the attention of the clinical education coordinator.
- If the problem is not resolved within a reasonable time, notify the visiting University faculty member in charge of clinical rotations.
- If the problem is not solved at this level, notify the Program Director to seek resolution.

If unwilling to accept the decision of the Program Director, the student may appeal to the Dean of the college, through the Chair of the Department of Medical Laboratory Sciences, for further review and resolution of the matter.

PROGRAM FACULTY AND STAFF

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PROGRAM ACCREDITATION

ACCREDITING AGENCY

The University of West Florida is accredited by the the Commission on Colleges of the Southern Association of Colleges and Schools. The Clinical Laboratory Sciences Program is further accredited by the National Accrediting Agency for Clinical Laboratory sciences (NAACLS). NAACLS is an autonomous, nonprofit organization which accredits education programs in clinical laboratory sciences. It is recognized by the United States Department of Education and by the Council for Higher Education Accreditation. The American Society for Clinical Pathology (ASCP) and the American Society for Clinical Laboratory Science (ASCLS) are sponsoring organizations of NAACLS. Accreditation is a process of external peer review in which an agency grants public recognition to a program of study that meets established qualifications and educational standards. The University of West Florida Clinical Laboratory Sciences Program has been accredited by NAACLS since 1986. Further information about NAACLS may be obtained from:

National Accrediting Agency for Clinical Laboratory Sciences
5600 N. River Rd.
Suite 720
Rosemont, IL 60018-5119
773.714.8880 ~ naacls.org

TRAINING PROGRAM APPROVAL BY THE STATE OF FLORIDA

UWF's Clinical Laboratory Sciences Program is approved by the Board of Clinical Laboratory Personnel (BCLP), which is a professional regulatory Board of the Division of Medical Quality Assurance (MQA) of the Department of Health of the State of Florida. The program identification code is TP155. UWF's Program is also a state-approved continuing education provider for clinical laboratory personnel. Further information may be obtained from:

Department of Health
Board of Clinical Laboratory Personnel
4052 Bald Cypress Way, Bin #C07
Tallahassee, FL 32399-3257
850.410.3193 ~ <http://www.floridahealth.gov>



CERTIFICATION AND STATE LICENSURE

NATIONAL CERTIFICATION AS A MEDICAL LABORATORY SCIENTIST

Graduates of the program are eligible to take the ASCP Board of Certification examination in order to be certified as medical laboratory scientists and to apply for licensure by the State of Florida.

ASCP-BOC certifies those individuals who meet the academic and clinical prerequisites and who achieve acceptable performance levels on this examination. The examination is administered

by computer at designated centers. At present the Board of Certification examinations are administered only by computer at Pearson Professional Centers. Application Fee is \$240 at the time of this publication.

Students are eligible to take the examination after earning a bachelor's degree, and completion of the program.

Students should apply for the examination 45 days prior to graduation. The program director will communicate the student's eligibility for the examination to ASCP. The student will receive a letter of eligibility, and then must schedule the examination date at the Pearson Professional Center. UWF transcripts with the bachelor's degree posted must be mailed to ASCP in order for the certification results to be released.

Students must apply online at www.ascp.org/Board-of-Certification and select US Certification. Following graduation and after passing the examination, students should also complete the state licensure application found on the ASCP website. The additional cost to certify the examination results to the state is \$16. Failure to complete the state licensure release form will cause a delay in receiving the Florida license and extra expense.

ASCP Board of Certification
33 W. Monroe St, Suite 1600
Chicago, Illinois 60603 800-621-4142

FLORIDA STATE LICENSURE

Medical laboratory scientists seeking employment in a clinical laboratory in the state of Florida must obtain a license as a Clinical Laboratory Technologist. The 2- year renewable license can be obtained when the Board of Clinical Laboratory Personnel receives notification from ASCP of successful completion of the graduate's certification examination.

Application and initial license fee for the five generalist areas is \$100 at the date of this publication.

Application for licensure is done online at doh.state.fl.us/mqa/ClinLab/index.html. You will also mail the signed application attestation form and any other required documents to:

Florida Department of Health
Board of Clinical Laboratory Personnel
4052 Bald Cypress Way, Bin #C07
Tallahassee, FL 32399-3257 850-488-0595

The application for a Florida license also requires your college transcript with the degree posted, your ASCP scores, and a certificate or letter of completion from the CLS program director.

PROFESSIONAL ORGANIZATIONS

It is strongly recommended that Clinical Laboratory Sciences students join the following professional societies and take advantage of the opportunities for professional growth and development these memberships provide.

AMERICAN SOCIETY FOR CLINICAL PATHOLOGY (ASCP)

Students enrolled in The University of West Florida CLS Program are eligible to become student associate members. Annual dues: free. Dues coverage includes subscription to e-newsbriefs, and www.labmedicine.com, as well as special “members only” discounts on ASCP educational programs, travel, insurance, car rental, financial services and credit card offers. “LabMedicine” contains case studies, articles on current issues, new techniques, latest products, and job opportunities. Articles from this journal will be part of curriculum assignments, lecture discussions, and laboratory case studies. Application forms may be obtained at www.ascp.org.

AMERICAN SOCIETY FOR CLINICAL LABORATORY SCIENCE (ASCLS)

ASCLS is a national organization whose members are involved in promoting all aspects of clinical laboratory professions. Their quarterly publication “Clinical Laboratory Science” is a source of technical information, professional issues, continuing education, and employment opportunities. National dues for students are \$25, and state dues are \$5.00. ASCLS membership provides discounts for workshop fees, technical and education publications, and continuing education services through “Focus on Learning,” the PACE Program, and the National Annual Meeting and Exhibits. Application forms may be obtained from the Program office or at www.ascls.org. The website for the Florida chapter is <http://www.fscls.org>.

OTHER ORGANIZATIONS

- American Association of Blood Banks (AABB) www.aabb.org
- American Association of Clinical Chemistry (AACC) www.aacc.org
- American Society for Microbiology (ASM) www.asn.org
- Clinical Laboratory Management Association (CLMA) www.clma.org
- Association for Molecular Pathology (AMP) www.amp.org
- Clinical and Laboratory Standards Institute (CLSI) www.clsi.org
- Association of Genetic Technologists (AGT) www.agt-info.org

Students may obtain information about membership, publications, workshops, and other related activities of these professional associations from program faculty. CLS students are encouraged to join at least one national organization and be involved in student forum activities of that association.



CLINICAL AFFILIATES

The Clinical Laboratory Sciences Program relies on its community partners for internship training. The program is affiliated with several hospitals mainly in the Pensacola drive radius, but spanning the Gulf Coast from Mobile Alabama to Tampa Florida. Our affiliate hospitals may be large, like Tallahassee Memorial Hospital, or small, like Santa Rosa Medical Center. Each affiliate is accredited by JCAHO, CAP and/or AABB. While each place has its own corporate culture, they all have professional medical laboratory scientists who provide caring mentoring for the UWF students. The listing of affiliates is current for 2018. The most recent list of affiliates as well as hospital education coordinators can be found at uwf.edu/mls.

HOSPITAL	ADDRESS
Baptist Hospital	1000 West Moreno St. Pensacola, FL. 32504
BayCare Health System	3001 Martin Luther King Jr Blvd., Tampa, FL 32607
Bay Medical Center	615 N. Bonita Avenue Panama City, FL. 32401
DW McMillan Hospital	1301 Belleville Ave. Brewton, AL. 36426
Ft. Walton Beach Medical Center	1000 Mar Walt Drive Ft. Walton Beach, FL. 32547
Gulf Breeze Hospital	1110 Gulf Breeze Pkwy Gulf Breeze, FL 32562
Jackson Hospital	4250 Hospital Drive Marianna, FL. 32447
James A Haley VA Med Center	13000 Bruce B. Down Blvd., Tampa, FL 33612
North Okaloosa Medical Center	151 Redstone Ave, SE Crestview, FL. 32539
OneBlood, Inc.	1731 Riggins Road Tallahassee, FL. 32308
Pensacola Pathologists	5149 N 9th Ave. Suite 122, Pensacola, FL 32504
Providence Hospital	6801 Airport Blvd. Mobile, AL. 36608
Quest Diagnostics at Infirmiry	5 Mobile Infirmiry Circle, Mobile, AL 36607
Sacred Heart Health System	5151 N. Ninth Ave. Pensacola, FL. 32504
Sacred Heart Emerald Coast	7800 U.S. Hwy 98 West Miramar Beach, FL. 32550
Santa Rosa Medical Center	6002 Berryhill Rd. Milton, FL. 32570
Shands Healthcare, UF	1600 S.W. Archer Road Gainesville, FL. 32608
Springhill Medical Center	3719 Dauphin Street, Mobile, Ala 36608
Synergy Laboratories	5570 Rangeline Rd. Mobile, AL 36619
Tallahassee Memorial Hospital	1300 Miccosukkee St. Tallahassee, FL. 32308
USA Medical Center	2451 Fillingim Street Mobile, AL. 36617
Veterans Administration- JACC	790 Veterans Way Pensacola, FL. 32507
West Florida Hospital	8383 N. Davis Highway Pensacola, FL. 32514
Woodlands Medical Specialists	4724 North Davis Hwy., Pensacola, FL 32503

COURSE OBJECTIVES AND LEARNING OUTCOMES

The course objectives for each of the university based core courses are described here. The course objectives for the clinical courses are to acquire competence at an entry level in each of the laboratory departments. Specific goals are provided in the Student Clinical Handbook, which is posted on the university elearning platform when the student is enrolled in that course.

HEMATOLOGY

Study of production, maturation and morphology of normal and abnormal human blood cells. Pathological changes in morphology, cytochemistry and distribution of cells in peripheral blood and bone marrow. Manual and automated methods for blood cell counts, hemoglobin measurement and other hematology parameters. Purpose, principle and clinical value of routine and special procedures. Quality control and quality assurance processes in a clinical hematology laboratory. Following successful completion of the course, the student will be able to:

- Demonstrate proficiency in collection, handling and processing of a blood specimen for hematological studies.
- Prepare and stain peripheral blood smears and use them to identify normal blood cells.
- Perform hematology laboratory procedures with accuracy and precision.
- State the expected values and identify the abnormal findings in various hematology laboratory procedures.
- Identify abnormal cells in peripheral blood and bone marrow smears and correlate the findings to the corresponding hematological disorder(s).
- Interpret and evaluate the abnormal findings and make appropriate clinical decisions for follow up or corrective action.
- Select and apply appropriate statistical procedures to evaluate data.
- Practice applicable laboratory safety rules and regulations while performing hematology lab procedures.
- Describe and practice quality control procedures in hematology lab.
- Read and evaluate published studies in clinical diagnosis and management of disease by hematology laboratory methods.
- Recognize and adhere to applicable professional regulations, ethical standards, and Program's code of conduct.

DIAGNOSTIC MICROBIOLOGY

Study of bacteria associated with infectious diseases. Includes microbial taxonomy, physiology, genetics and host-parasite relationships as they apply to clinical microbiology. Pathogens of particular organ systems, pathogenesis of infectious disease, clinical manifestations, etiology and epidemiology of disease are covered. Interpretation of test results and clinical relevance are taught utilizing case studies. Following successful completion of the course, the student will be able to:

- Describe the virulence factors associated with the most frequently encountered bacterial pathogens of humans. List appropriate culture media for microbiological samples from the body sites most often cultured. Describe appropriate quality control techniques for biochemical testing and media usage.
- Explain the principles underlying the biochemical tests commonly used in clinical microbiology laboratories, and list at least one organism expected to be positive and one expected to be negative for these tests (to act as QC). State the Gram stain morphology, growth characteristics, sources of isolation and biochemical test result pattern to identify

bacteria commonly encountered in the microbiology laboratory. Correlate bacterial species with the pathological states they may cause, and their most common sites of isolation.

- Identify unknown samples using gram stain, morphology, case information and biochemicals.
- Utilize the appropriate safety precautions for biologic and chemical substances.
- Discuss and classify the most common bacteria found as human pathogens Interpret antibiotic sensitivity tests and discuss modes of resistance to antibiotics.

MEDICAL MICROBIOLOGY

Study of medical microbiology covering areas of clinical parasitology, mycobacteriology, clinical virology, clinical mycology, and miscellaneous and emerging pathogens. Following successful completion of the course, the student will be able to:

- Describe the laboratory techniques and procedures used in the diagnosis of parasitic, fungal and mycobacterial infections.
- Describe appropriate collection and handling of specimens for parasitic, fungal and mycobacterial examination.
- Describe the life cycle, morphology, diagnostic stage and pathogenicity of protozoan and helminth parasites. Describe the diagnostic stage, site of infection and pathogenicity of common fungal elements.
- Describe the identification of various species of Mycobacteria. Explain the pathogenicity of each.
- Identify parasites, fungi, and mycobacteria from photographs, permanent slides, and other prepared laboratory media
- Describe collection, handling, and diagnostic techniques used in virology.

URINALYSIS AND BODY FLUIDS

Teaches the entry level clinical laboratory scientist the physiology, routine testing and interpretation for the following body fluids: urine, cerebrospinal fluid, semen, sweat, serous fluids (peritoneal, pleural, pericardial, synovial), and dialysates. Correlation of lab findings to various disease conditions is stressed. Following successful completion of the course, the student will be able to:

- Diagram the nephron, and highlight the regions where salts and water are regulated. Discuss metabolic diseases that are detected by urinalysis.
- List the components of the biochemical dipstick, and correlate

disease states with positive results. Discuss interfering factors. Perform confirmatory tests for positive dipstick results. Perform automated urinalysis, and use an algorithm to determine if a microscopic exam is required. Explain proper collection procedures and preservatives for random and 24 hour samples. Perform and interpret macroscopic and microscopic analysis.

- Explain proper specimen collection, handling, and storage of body fluid specimens other than urine. Discuss the purpose and principle as well as normal and abnormal findings of basic chemistry procedures. Correlate laboratory results with normal and abnormal conditions and discuss the clinical significance. Describe possible causes for error in testing. Demonstrate a minimal skill in basic procedures. Integrate computer skills as appropriate for calculations. Discuss quality control for body fluids.

CLINICAL CHEMISTRY I

Course Description: Introduction to the basic principles and procedures of clinical chemistry. Lecture and lab devoted to the chemical analysis and interpretation of blood and other body fluids. Topics covered include lab safety, specimen collection, lab mathematics, basic lab instrumentation and automation, data management, reference range determination, basic statistics applied to the lab and quality control monitoring. This course will discuss the pathophysiology and diagnostic testing related to the metabolism of amino acids and proteins, non-nitrogen compounds and renal function, carbohydrates and lipids, assessment of diabetes and diabetic risk, enzymes kinetics, assessment of cardiac risk and prognosis following myocardial infarction, liver function, pancreatic and gastrointestinal function and porphyrins and hemoglobin metabolism and abnormalities. Methodologies discussed include spectrophotometry, immunodiagnosics and computer generated analysis. Students are required to participate in all class discussion about recent research in the field of clinical chemistry which will be presented in the form of abstracts, research papers, and figures. Upon successful completion of the lecture and laboratory components of this course, the student will be able to:

- State the principles behind basic lab mathematics and apply them to Beer's and Lambert's law, Friedewald equation, normality, molarity, osmolality, dilutions, proportions, methods correlations, precision, specificity and linear regression.
- Correlate laboratory analytes with the organ(s) of origin, and with the predominant critical range for key blood analytes including Glucose, BUN, Creatinine, Total Protein, Albumin, Cholesterol, Triglycerides, Lipoproteins, Bilirubin, Clinically Significant Enzymes, Cardiac Markers, Gastric Analysis, and

Porphyrins. State the most common methodology used to measure the above individual analytes. Identify caveats for procedures and specimens that may make them inaccurate.

- Generate reference ranges using the customary statistical approach and list preanalytical, analytical, and post-analytical variables that may influence accuracy. Interpret Levy-Jennings quality control charts using the correct Westgard rules.
- Accurately perform and interpret manual and automated laboratory procedures, using standard pipetting, calculations, Excel worksheets and reference ranges. Utilize safe laboratory policies and procedures in the form of donning personal protective equipment, utilizing appropriate engineering controls and work practices.
- Integrate the laboratory results with patient history and examination to derive the big picture, in the form of case studies preparation and presentation. Research and present abstracts and research papers about recent research in the field of clinical chemistry.
- Demonstrate professionalism, integrity, respect for instructors, students and patients, regard for privacy and knowledge of HIPAA and other regulations pertaining to the health care field.
- Evaluate new products by assessing manufacturer's information sheet, comparing and interpreting protocols, limitations, specimens, regression analyses, costs, personnel, and turn-around time. Access appropriate databases to search for abstracts/papers on relevant research, and apply epidemiologic and biostatistical tools to interpret the gist of the research.

CLINICAL CHEMISTRY II

Course Description: This course continues where Clinical Chemistry I left off, discussing kidney function, electrolytes, blood gases, acid-base balance, mineral metabolism, enzyme measurement, liver function studies and pancreatic function assessment. It also includes the more esoteric tests involved in testing endocrine function, therapeutic drug monitoring, toxicology, tumor markers, and testing during pregnancy. Methodology is primarily immunoassay, potentiometry and spectrophotometry. Reading and disseminating research in the discipline is emphasized in the format of a journal club. Upon successful completion of the lecture and laboratory components of this course, the student will be able to:

- State the principles, concepts, and calculations behind the determination of fluid homeostasis, acid-base balance, anion gap, Henderson-Hasselbach equation, and base excess and apply them to interpretation of electrolyte and arterial blood gas determinations.

- Correlate laboratory analytes with the organ(s) of origin, and with the predominant critical range for key blood analytes including Sodium, Potassium, Calcium, Phosphorus, Magnesium, Chloride, CO₂, pH, pCO₂, pO₂, Bicarbonate, Trace Elements, Amylase, Lipase, Clinically Significant Hormones including Aldosterone, Cortisol, Thyroid Hormones, Parathyroid Hormone, Vitamin D, Growth Hormone, Sex Hormones, Tumor Markers, Pregnancy Hormones, Therapeutic Drug Monitoring, and Toxicology. State the most common methodology used to measure these individual analytes. Identify caveats for procedures and specimens that may make them inaccurate.
- Perform correct specimen collection procedure of a blood specimen for chemistry analysis including patient preparation, appropriate anticoagulant and order of draw. Demonstrate correct identification of specimens according to JCAHO National Patient Safety Standard. Explain corrective measures for unacceptable specimens. List pre-analytical, analytical, and post-analytical variables that may influence accuracy of laboratory determinations.
- Accurately perform and interpret manual and automated laboratory procedures, using standard pipetting, calculations, Excel worksheets, and reference ranges for the above listed analytes. Explain the purpose of quality control and quality assurance in the laboratory. Discuss the difference between calibrators/standards and quality control materials. Demonstrate their utilization in a laboratory quality control program. State possible reasons for QC results being outside acceptable limits. Discuss appropriate actions for unacceptable control results.
- Utilize safe laboratory policies and procedures in the form of donning person protective equipment, utilizing appropriate engineering controls and work practices.
- Integrate the laboratory results for the above listed analytes with patient history and examination to derive the big picture, in the form of case studies preparation and presentation. Research and present abstracts and research papers about recent research in the field of clinical chemistry.
- Demonstrate professionalism, integrity, respect for instructors, students, and patients, regard for privacy and knowledge of HIPAA and other regulations pertaining to the health care field.

HEMOSTASIS AND THROMBOSIS

Role of blood vessels, platelets and coagulation factors in normal hemostasis. Platelet morphology and function, laboratory tests for evaluation of platelets, and platelet disorders. Study of coagulation factors, coagulation pathways and inherited and acquired coagulation disorders. Normal fibrinolysis and disorders

of fibrinolysis. Physiologic and pathologic coagulation inhibitors and their role in normal and abnormal hemostasis. Diagnosis and management of hemorrhagic diseases. Thrombotic disorders and their management by anticoagulant therapy and fibrinolytic therapy. Following successful completion of the course, the student will be able to:

- Collect and prepare a venous blood specimen for coagulation laboratory work.
- Demonstrate knowledge of suitable anticoagulants, correct handling and preservation of specimens for routine and special coagulation tests.
- Discuss the role of blood vessels in hemostasis and laboratory evaluation of vascular disorders.
- Explain the morphology and function of platelets in primary hemostasis.
- Describe the quantitative and qualitative platelet disorders; and the laboratory tests that are useful in the evaluation of bleeding disorders due to platelet functional defects.
- Demonstrate the knowledge of coagulation factors and pathways.
- Perform the routine laboratory tests for platelet function and blood coagulation factors. Integrate computer skills as necessary for calculations.
- Discuss the inherited and acquired coagulation disorders and the specific diagnostic tests in each case.
- Discuss the laboratory tests performed to monitor heparin and coumadin therapy.
- Given various test results of the coagulation work-up on a bleeding patient, identify the coagulation problem and suggest further laboratory tests that may aid in diagnosis.

CLINICAL IMMUNOLOGY

This class will teach the entry level clinical laboratory scientist the role of immune system and its components including: complement, antibody and antigens, cellular and humoral immunity are described. Serology of noninfectious clinical disorders such as hypersensitivity reactions, system and organ/tissue autoimmunity are examined. Immune-mediated diseases, such as primary and acquired immunodeficiencies are discussed. Diseases that are diagnosed using serologic methods for bacterial, fungal and parasitic infections, such as syphilis, infectious mononucleosis, and measles are reviewed. Current methodologies used in the medical serology and immunodiagnostic laboratory are introduced.

- Describe the fundamentals of immunology including terminology, the lymphoid system, immunological reactions autoimmunity, and hypersensitivity.
- Explain the principles of immunological assays including: agglutination and precipitation reactions, labeled and unlabeled immunoassays, and flow cytometry.
- Perform serology laboratory math including: dilutions, sensitivity and specificity determinations and positive and negative predictive values.
- Read and discuss published studies in clinical diagnosis and management of disease by immunological or serological methods.
- Recognize and adhere to applicable professional regulations, ethical standards, and Program's code of conduct.
- Practice applicable laboratory safety rules and regulations while performing immunology lab procedures.
- Demonstrate proficiency in collection handling and processing of a blood specimen for immunological and serological studies.
- Select appropriate statistical procedures to evaluate data.
- Perform immunological laboratory procedures with accuracy and precision.
- Describe and perform experimentation used to evaluate immunological analytes such as ELISA, agglutination, antibody detection and titration.

IMMUNOHEMATOLOGY

Fundamentals of blood group immunology. Pre-transfusion testing of patient blood and donor blood for compatibility. Antigens, antibodies and their properties in clinically significant blood group systems. ABO & Rh typing, compatibility testing and special tests. Antibody screen and identification. Autoimmune Hemolytic Anemia and Hemolytic Disease of the Newborn. Transfusion therapy, hazards of transfusion and investigation of transfusion reactions. Donor selection, collection of donor blood and testing for infectious agents. Preparation, storage and utilization of blood components. Regulations, medico-legal and ethical aspects of transfusion services. Following successful completion of the course, the student will be able to:

- State the principles behind blood grouping, compatibility testing, gel technology and antibody identification. List the most common blood group antigens involved in incompatibilities, and discuss the most frequently encountered alleles within the groups. State the biochemical properties of the corresponding antibodies, with respect to reactions in temperature, enzymes, and enhancement media. State the relative proportions of the

common blood groups in the general population.

- List blood product components, state their customary use, their collection and storage, and inventory mechanisms. Correlate components with patient needs. Identify the mechanisms used to match the correct component to the patient. Discuss patient safety mechanisms in transfusion, including patient identification, pre-transfusion testing and donor testing.
- State the procedure for routine type and crossmatch, incompatible crossmatch, and hemolytic transfusion reaction work up. Perform ABO and Rh testing, and discuss ABO discrepancies. Identify blood group antibodies using antigen panels. Correlate antibodies with antigens. Discuss IgG versus IgM antibodies with respect to formation, methods to identify, and methods to neutralize antibodies.
- Discuss the most common causes of HDN, and modern methods to minimize the risk. Perform a cord blood workup on a baby with hemolytic disease of the newborn. Perform a prenatal and antenatal workup on the mother. Perform and interpret a fetal maternal bleed screen.
- Discuss non-hemolytic transfusion reactions. Discuss blood component therapy, and reasons for incompatibility.
- Integrate the laboratory results with patient history and examination to derive the big picture, in the form of case studies.

MOLECULAR DIAGNOSTICS

This course offers fundamentals of clinical diagnosis and management of disease by molecular biology laboratory methods. Two broad areas in the current state of the art will be addressed: molecular diseases/variants and molecular methods to diagnose and monitor disease. Disorders due to inherited or acquired molecular defects such as errors of metabolism, hemoglobinopathies, leukemia, and cystic fibrosis are discussed. Principles and procedures for the diagnosis and management of infectious diseases by molecular methods are also included. The discussion of molecular approaches to diagnosing and monitoring these diseases will span the conventional methods of PCR, gel electrophoresis and Southern Blotting to semi-automated methods of TMA, LCR and Real-time PCR. A survey of molecular diagnostic methods currently available in various sections of a clinical laboratory is included. Following successful completion of the course, the student will be able to:

- Describe the molecular defects that are associated with a number of diseases using correct genetic terminology. Discuss

and compare the conventional methods when appropriate and correlate them with molecular methods.

- Discuss the ethical issues involved in genetic selection by prenatal testing, using sickle cell anemia and cystic fibrosis as a platform. Analyze the ethical/cost issues faced by state governments in screening newborns for genetic defects. Discuss and interpret paternity/identity testing.
- Utilize the paradigm of HIV testing to give examples of the utility for ELISA, Western Blot, RT-PCR, and viral loads during the detection and monitoring of a disease. Research the current methods in use to screen the nation's blood supply.
- Compare and contrast the following methods: ELISA, Western Blot, Southern Blot, DNA chip, RIBA, LCR, PCR, TMA, LIPA, and dot blot assays. Compare and contrast RFLP and automated STR testing in identity and paternity testing. Discuss the methodology for fluorescent DNA sequencing, and correctly interpret and identify the DNA from a DNA electropherogram.
- State the appropriate methods used in a molecular lab to prevent contamination.
- Accurately perform agarose electrophoresis And utilize calibrated densitometers and labeled probes to calculate product quantity, size and identity and interpretation. Utilize public access data bases to compare unknown DNA sequences to known sequences. Execute a short term project that integrates several molecular methods, and culminates in a professionally written laboratory report.

SPECIAL CLINICAL TOPICS TRADITIONAL TRACK

Fundamentals of clinical laboratory management, supervision and educational methodologies are covered. Students are introduced to clinical laboratory operations in areas of financial and human resource management, marketing of laboratory services, communications with other health care professionals, laboratory information systems and regulatory compliance with applicable regulatory agencies. Other special clinical topics related to education and training, lab safety, HIV/AIDS, prevention of medical errors, professional ethics and career planning are presented. Following successful completion of the course, the student will be able to:

- Describe the basic principles and philosophies of management and explain how they apply to the clinical laboratory.
- Discuss the basic principles of laboratory finance and perform appropriate calculations.

- Describe the basic concepts and principles of education concerning curriculum development, instructional presentation, and evaluation.
- Explain the process of performance Improvement.
- Describe the components of laboratory information systems.
- Discuss ethical and legal issues associated with the healthcare field.
- Discuss the pertinent state regulations governing laboratories and clinical laboratory scientists.
- Explain the role of the agencies which set forth regulations governing accreditation and the requirements for compliance.
- Discuss HIV/AIDS and the role of the laboratory in diagnosis, monitoring, and prevention.
- Describe methods to prevent medical errors in the clinical and laboratory setting.
- Explain the application of Florida state rules and regulations.

CLINICAL MANAGEMENT PORTFOLIO MLT-to-MLS TRACK

Fundamentals of clinical laboratory management, research and educational methodologies. Students are introduced to clinical laboratory operations including financial and human resource management, marketing of laboratory services, communication with other health care professionals, laboratory information systems, research design and compliance with regulatory agencies. The student will provide evidence of adequate training or work experience in Hematology, Clinical Chemistry, Microbiology and Blood Bank equivalent to an MLS clinical internship and produce this in a professionally developed portfolio. The student will produce a professionally written case study that is suitable for publication. Following successful completion of the course, the student will be able to:

- Describe the basic principles and philosophies of management and performance improvement and explain how they apply to the clinical laboratory.
- Describe the basic concepts and principles of education concerning curriculum development, instructional presentation, and evaluation. Utilize Bloom's taxonomy in writing SLO's.
- Describe the components of laboratory Information Systems.
- Discuss ethical and legal Issues associated with the healthcare field. Discuss the pertinent state regulations governing laboratories and Clinical Laboratory Scientists. Describe methods to prevent medical errors in the clinical and laboratory setting.
- Produce an employment/training portfolio that provides evidence of adequate clinical training or work experience in the sections of Hematology, Clinical Chemistry, Microbiology and Blood Bank that is equivalent to an MLS clinical internship.
- Evaluate research studies. Develop and revise a professionally written case study that is suitable for publication.

OBJECTIVES FOR AFFECTIVE DOMAIN

The Clinical Laboratory Sciences program is preparing students to behave as professionals. Affective domain objectives are professional behaviors that are valued in employees and coworkers. While at the university and at the clinical affiliates, students shall demonstrate:

- Punctuality and consistency of attendance in scheduled classes, field trips and clinical rotations.
- Willingness and ability to follow verbal and written instructions.
- Effective communication skills with instructors, patients and other individuals at the work place.
- Initiative to perform approved procedures prior to being requested to perform them.
- Intellectual curiosity and enthusiasm for learning; demonstrated by independent reading, listening and questioning appropriately.
- Ability to accept constructive criticism and good faith effort to improve performance.
- Constructive utilization of time not scheduled for class room instruction or training at the workbench.
- Maintenance of patient confidentiality.
- Ability to recognize errors and discrepancies, and take appropriate corrective measures.
- Exhibit cleanliness and good organization at the work station.
- Adherence to all of the required lab safety precautions and procedures.
- Integrity by reporting only properly quality controlled results.
- Application of previous learning.
- Ability to work independently as expected for student level of expertise
- Honesty in academic work.
- A professional appearance through personal grooming, hygiene and appropriate clothing.
- An appreciation and interest in life-long learning by attending continuing education program.





Department of Medical
Laboratory Sciences
UNIVERSITY *of* WEST FLORIDA

For complete information about a BS degree in Clinical Laboratory Sciences and a personalized academic advisement/degree plan, please contact:

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