Overview of CLS
Clinical laboratory scientists (CLS), also known as medical laboratory scientists (MLS) or medical technologists (MT), play a vital role in the management of patients. They constitute the third largest medical profession (following doctors and nurses) and perform complex testing to detect diseases and monitor treatments in patients. About 75% of medical decisions on patients are based on the interpretations of laboratory test results.

The majority (70%) of clinical laboratory scientists (CLS) will work in hospital laboratories. Typical areas in the laboratories include hematology/coagulation, microbiology, chemistry, urinalysis, transfusion medicine and immunology. The remaining CLS (30%) have been employed in industry, clinics, public health, reference and forensic laboratories, education, sales and service of instrumentation.

Introduction
The CLS Program is designed to prepare students to enter the field of Clinical Laboratory Science or Medical Technology. This is a profession where the theoretical knowledge of biology and chemistry is applied in the diagnosis and treatment of disease and maintenance of health. It requires independent judgement, correlation of test results, and interpretation of findings with respect to normal values.

The program culminates in a baccalaureate degree after three years of undergraduate pre-professional coursework and completion of the 12-month clinical laboratory science program. The professional phase begins with an intensive 4 months ‘on campus’ phase where students receive instruction in clinical chemistry, urinalysis, hematology, microbiology, immunohematology and immunology. The second phase is a combination of half day rotations or experiences at the clinical sites and half days of ‘on campus’ instruction in clinical chemistry, molecular diagnostics and hemostasis. The final phase during the summer is primarily clinical rotations at the facilities coupled with ‘on campus’ training in management, education, research, and case studies. Upon successful completion of the program, students are eligible to take the national certification exam.

Mission Statement
The mission of Clinical Laboratory Science at Texas A&M University-Corpus Christi is to prepare students for a productive career in clinical laboratory science and related fields and to provide students with the intellectual, cultural and ethical foundations necessary to contribute effectively and positively to a changing global community.

Program Goals
The goals of Clinical Laboratory Science at Texas A&M University-Corpus Christi include:
1. Providing the student with a solid foundation of knowledge to build upon through added experience. This foundation should include:
• An in-depth knowledge of techniques, principles, instruments, and their inter-relationships in the clinical laboratory at hospitals as well as in a variety of other settings
• The ability to recognize the interdependency of clinical laboratory tests and interpret the validity of the tests through knowledge of the physiological and pathological conditions which affect the tests
• A sense of pride in the quality of work and in the contribution toward quality patient care
• A continuing interest in expanding their knowledge and in professional advancement
• A basic understanding of leadership skills and techniques as applied to the clinical laboratory
• The educational background necessary to provide the flexibility to adapt to an evolving profession and to accept the challenge of new opportunities

2. Supporting and encouraging intellectual growth of the faculty through applied research and continued education
3. Developing innovative programs, curricula and teaching methods to meet the needs of the diverse student population and the changing profession
4. Providing information, expertise and service to the community

Admission Requirements
Students must complete all prerequisite coursework and any necessary university admission requirements, if applicable, prior to entering the program. The pre-professional curriculum includes core requirements and 16 hrs in biology, including microbiology, immunology, and genetics, and 12 hrs of chemistry, including inorganic, organic, and biochemistry. The professional phase of the program has limited capacity and is competitive. **Students must have an overall GPA of 2.7.** Students must complete an application for the university, provide all transcripts, and a separate application to the CLS program (see website). Students will be accepted in May-August for the Fall semester.

Advanced Placement
Any student may earn credit by examination for CLSC 3200, 3102, 4325, and 4370. Students must enroll in the course and receive permission from the instructor and the program director. The test will be administered by the instructor and must be passed with a grade of 80% or above. A written and practical exam may be given. Students failing the exam must complete the course for a grade.

University Policies
University policies related to student conduct, academic and nonacademic appeals are consistent with those in effect for students enrolled in TAMUCC and are found in the TAMUCC University Handbook 13 STUDENTS ([https://www.tamucc.edu/governance/rules-procedures/index.php#gsc.tab=0](https://www.tamucc.edu/governance/rules-procedures/index.php#gsc.tab=0)).
### Professional Curriculum Sequence

**FALL**
- CLSC 3200 Essentials for Applied Laboratory Sciences 2 SCH
- CLSC 3102 Essentials Laboratory for CLS 1 SCH
- CLSC 4325 Clinical Chemistry I 3 SCH
- CLSC 4420 Hematology 4 SCH
- CLSC 4430 Clinical Immunology 4 SCH
- CLSC 4370 Clinical Microbiology I 3 SCH

**SPRING**
- CLSC 4326 Clinical Chemistry II 3 SCH
- CLSC 4280 Introduction to Clinical Laboratory Science 2 SCH
- CLSC 4382 Advanced Medical Laboratory Procedures 3 SCH
- CLSC 4297 Professional Practicum I 2 SCH
- CLSC 4371 Clinical Microbiology II 3 SCH
- CLSC 4120 Hemostasis 1 SCH

**SUMMER I**
- CLSC 4598 Professional Practicum I 5 SCH
- CLSC 4200 Professional Skills for CLS 2 SCH

**SUMMER II**
- CLSC 4599 Professional Practicum II 5 SCH
- CLSC 4182 Seminar-Clinical Correlations 1 SCH

### Clinical Affiliates
The TAMUCC Clinical Laboratory Program is currently affiliated with twelve healthcare facilities. Students are placed at one or more of these sites for their clinical experiences. Students must adhere to the rules and regulations of the clinical affiliates and there may be some differences as far as courtesy services extended to students. Requests for specific clinical assignment/placements will be considered, but due to scheduling considerations, the program cannot guarantee specific assignment/placements.

All students are responsible for their own travel arrangements to assigned clinical sites. A list of the current affiliates is provided below.

**Christus Spohn Health System:**
- Christus Spohn Shoreline 600 Elizabeth St. Corpus Christi, Tx 78414
- Christus Spohn South 5950 Saratoga Corpus Christi, Tx 78414
- Christus Spohn Kleberg 1311 E. General Cavazos Blvd Kingsville, Tx 78363
- Christus Spohn Beeville 1500 E. Houston St. Beeville, Tx 78102
- Christus Spohn Alice 2606 Hospital Blvd. Alice, Tx 78405

**Citizens Medical Center**
- 2701 Hospital Dr. Victoria, Tx 77901

**Corpus Christi Medical Center:**
- CCMC Bay Area 7101 SPID Corpus Christi, Tx 78412
- CCMC Doctor’s Regional 3315 S. Alameda Corpus Christi, Tx 78411

**Corpus Christi Public Health Dept.**
- 1702 Horne Rd. Corpus Christi, Tx 78416
Student Outcomes
1. Master the Entry Level Curriculum, including interpretation, performance, and application of laboratory testing appropriate for graduates.
2. Develop the proficiency to evaluate and analyze problems efficiently to achieve problem resolution.
3. Communicate laboratory information effectively to patients, health care providers, families and physicians.
4. Cultivate the value of continuing professional development within the CLS scope of practice.

Career Entry Competencies for the Graduate
Graduates of the CLS Program should be prepared to become active functional members of the professional laboratory community while continuing to evolve as a practitioner.

Professionalism
The graduating Clinical Laboratory Scientist is expected to:
- Maintain professional standards in all matters related to the ethics, medical information and job responsibilities.
- Promote public relations for the clinical laboratory by maintaining professional image and conduct.
- Utilize appropriate communication skills for exchanging ideas and information and transmitting laboratory results.
- Recognize the need for continuing education for the application of current scientific/technical knowledge in the clinical laboratory and for participation in professional organizations.
- Demonstrate an awareness of the knowledge/responsibility level of the clinical laboratory scientist and of other laboratory personnel.

Skills
The graduating clinical laboratory scientist is expected to:
- Obtain blood from a patient insuring the comfort and safety of the patient before, during and following blood collection.
- Obtain and process specimens, utilizing appropriate techniques and maintaining integrity of the specimen in relation to the test to be performed.
- Determine the priority of laboratory requests and arrange the workload to provide for optimal patient care and workload efficiency.
- Calibrate and operate instruments and equipment using the appropriate materials and following established protocols.
- Perform preventative maintenance operations on laboratory instruments following established protocols.
• Perform tests according to established methods, utilizing efficient organization and work flow and producing accurate test results.
• Accurately calculate, record, and report test results and associated information, conforming to established procedures and standards.
• Prepare and periodically update procedure manuals.
• Instruct students and/or personnel in the operation and maintenance of instruments and equipment, the performance of methods and procedures and standards.
• Recognize, record and evaluate instrument or equipment malfunctions and discrepancies in test results.
• Prepare and label chemical and biological reagents and materials according to prescribed directions, using proper laboratory techniques and observing safety precautions.
• Monitor acquisition, processing and storage of laboratory supplies.

Knowledge
The graduating clinical laboratory scientist is expected to:
• Recognize correct specimen collection procedures based on test request, analytical system requirements and patient status.
• Identify or state principals of basic laboratory methods.
• Recognize internal and external policies and regulations including medico-legal custodial responsibilities for the acquisition, identification, transport, storage and disposal of specimens.
• Recognize hazardous specimens and materials and process them according to established safety measures.
• Associate basic human physiology and pathophysiology with test results.
• Evaluate the validity of test results by relating them to reference intervals, quality control data, analytical system performance, correlation with other test data and patient status.
• Recognize situations in which additional or confirmation procedures are indicated.
• Demonstrate an awareness of necessity for periodic evaluation of safety manuals, procedure manuals, and instrument maintenance protocols.
• Demonstrate an awareness of the use of basic management principles in the clinical laboratory setting Including:
  • critical pathways and clinical decision making
  • performance improvement
  • dynamics of healthcare delivery systems as they affect laboratory service
  • human resource management to include position description, performance evaluation, utilization of personnel, and analysis of workflow and staffing patterns
  • financial management: profit and loss, cost/benefit, reimbursement requirements, materials/inventory management
• Critically evaluate and review published research.

Synthesis
The graduating clinical laboratory scientist is expected to:
• Establish a patient identification system.
• Select, evaluate and implement laboratory test methods including the selection of reagents.
• Develop and monitor quality assurance systems/quality improvement including an instrument maintenance program
• Establish criteria for evaluating and evaluate the suitability of specimens for the analysis requested.
• Establish a system for providing patients with blood and blood products in accordance with internal and external policies and regulations or standards.
• Establish reference intervals appropriate for the systems utilized and the population served.

Professional Organizations
The American Society for Clinical Laboratory Science (ASCLS) is a national professional association representing laboratory personnel. It is dedicated to serving the educational, economic, legislative and social needs of its members. The organization is open to students enrolled in the Clinical Laboratory Science Program. Student membership is approximately $25.00/year and includes membership in the state and local organizations. Some benefits include discounted fees for workshops and conferences, eligibility for scholarships, and the professional journal, *Clinical Laboratory Science*.

Grading
Each instructor will supply students with a course syllabus which explains the individual course requirements. Students must pass the lecture and lab or clinical portions with a grade of ‘C’ or better.

• If a student earns a grade of D, F, or W, in a CLSC course, that course must be repeated and can only be repeated once.
• If a student earns a grade of D, F, or W in two CLSC courses, or twice in the same CLSC course, the student will be dismissed from the program.
• Students receiving a grade of D, F, W, or I in a CLSC course cannot progress to courses for which that course is a pre-requisite.
• Following dismissal, students may apply for reinstatement to the CLSC program, but reinstatement is competitive and based upon space availability.

Safety
Any accident or injury while participating in a scheduled lab, lecture, or practicum activity should be reported immediately to the supervising instructor. It is the policy of the CLS program to make the lab environment a safe place for students, staff, and faculty. There is a lab safety manual housed in the BSL2 laboratory and available online and Blood Borne Pathogen Exposure SOP within the safety manual.

Outside Employment
Due to the intensive nature of a professional program, students are advised not to work excessive hours and carry a full course load. Students who attempt to work excessive hours (>20 hrs/week) often end up in serious academic difficulty.
Application for Graduation
Students must apply for graduation and pay appropriate fees by the deadline stated in the university catalog. Students are responsible for checking current deadlines for graduation.

Counseling and Health Services
The University Counseling Center offers counseling to students at no cost. Services include both group and individual counseling. All information discussed with the professional counselors is kept in strict confidence. [http://counseling.tamucc.edu/](http://counseling.tamucc.edu/)

The University Health Center is open M, T, Th, Fri from 8:00am-5:00pm and W from 9:00-5:00pm. Various services are available to students at a reasonable cost including physical examinations, vaccinations, drug screens, and minor injuries. [https://www.tamucc.edu/health-center/index.php](https://www.tamucc.edu/health-center/index.php)

Disability Services
Students with disabilities are encouraged to contact the Disability Services office for a confidential discussion of their individual needs for academic accommodation. It is the policy of TAMUCC to provide flexible and individualized accommodations to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Disability Services Office (CCH 116). The office number is 361-825-5816 and contact email is disability.services@tamucc.edu. Additional information can be found at [https://disabilityservices.tamucc.edu/](https://disabilityservices.tamucc.edu/).

Certification
Graduates of the CLS Program at Texas A&M University-Corpus Christi are eligible to take the national examination (Board of Certification through the American Society of Clinical Pathology) for certification as medical laboratory scientists. Most employers require certification for employment. Obtaining the Bachelor of Science degree in CLSC or the post-baccalaureate certification is not contingent on passing a national examination.

American Society of Clinical Pathology (ASCP)
Board of Certification (BOC)
33 W. Monroe St., Suite 1600
Chicago, IL 60603
Main: 312-541-4999
[www.ascp.org/Board-of-certification](http://www.ascp.org/Board-of-certification)

Accreditation
The CLS Clinical Laboratory Science Program at Texas A&M University-Corpus Christi is fully accredited by the National Accrediting Agency for the Clinical Laboratory Sciences (NAACLS).
CLS Faculty and Staff
Jean Sparks, PhD, MT(ASCP), Program Director
Felix Omoruyi, PhD, SC(ASCP), NRCC-CC
Qian Qian Liu, PhD, MLS(ASCP)
Jessica Han, BS, Lab Coordinator
Eulanda Hancock, BS, MLScm(ASCP)

Dress Code
On campus - Laboratory-shorts are not appropriate in the laboratory. Lab coats are worn in the student labs and are not to be removed from the laboratory area. Closed toe shoes are required in the labs. Students must conform to existing safety guidelines when using potentially biohazardous materials.

Clinical practicums - students are expected to wear either scrubs (NO navy or red) or casual business attire with their identification badge (Sandollar card). The student must present a professional appearance.

Clinical Educational Experience
The program strives to ensure that appropriate clinical sites are available to accommodate all students in the program. The program recognizes that unforeseen changes can occur in a facility’s status due to workload constraints, staffing, or other events. The program director will try to locate other clinical sites, but, if no additional slots are available, clinical placement will follow this criteria:

- Students must be in good standing (C or higher in all CLSC courses)
- Eligible students not admitted to clinicals will be admitted to clinicals the following fall semester and will graduate in December

During the Clinical Practicum portion, student schedules may not conform exactly to the University schedule. Students will be evaluated on the psychomotor, cognitive, and affective behaviors and meet passing standards in all three areas. Students in the summer semester will meet once a week for review and exams.

Clinical Schedules
During the spring clinical experience, students will be required to attend rotations on a part-time basis. The typical schedule for clinicals is 7:00am-12:00pm. Some rotations require the students to be present at 6:00 or 6:30am. Summer I and II clinicals will include full-time participation and the typical schedule is 7:00am-2:30pm. Students will be fully informed of these schedules in advance so that arrangements can be made.
Students will not be included in the staffing numbers at the hospitals to meet the service load for the hospital, but will participate in general activities of the clinical laboratories to achieve career entry-level skills.

Clinical rotation schedules are arranged for each student with time allotment as follows:

<table>
<thead>
<tr>
<th>Clinical Chemistry</th>
<th>Routine chemistry</th>
<th>3 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematology</td>
<td>Routine hematology &amp; coagulation</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Differentials</td>
<td>Routine differentials</td>
<td>1 week</td>
</tr>
<tr>
<td>Immunohematology</td>
<td>Routine type, crossmatch, and antibody testing</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Microbiology</td>
<td>Routine microbiology/serology</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Phlebotomy/Special Chemistry</td>
<td>Phlebotomy and techniques in special chemistry</td>
<td>1 week</td>
</tr>
</tbody>
</table>

**Clinical Practicum Requirements**

- Criminal Background Check (Castlebranch)
- Urine Drug Screen (Health Services on Campus)
- Current Immunizations
  - PPD (annual)
  - Flu (annual)
  - Tdap, Chickenpox (history or titer), MMR
  - Hepatitis B
  - COVID immunization may be required
  - Some facilities had additional requirements and paperwork to be completed before student can begin rotations
- All students must wear Sandollar cards for identification during clinical rotations

**Liability Insurance**

Students are required to maintain professional liability insurance during their enrollment in the program. A blanket policy is provided through TAMUCC.

**Attendance**

Students are expected to attend ALL classes and clinical rotation days as assigned during the times scheduled unless prevented from doing so by serious extenuating circumstances. Punctuality and dependability are professional traits that students are expected to exhibit. Students are assigned for a period of 7 hours per day with a break for lunch and other breaks as designated by the facility.

Students will follow the holiday schedule of the Clinical Facility.

In the event of absence from the clinical rotation:

- Call the clinical instructor in the department at the assigned hospital
- Email or text the faculty member responsible for the clinical rotations.

In the event of a late arrival:

- Contact the clinical instructor as early as possible
Follow up with an email or text to the faculty member when practical. Absences in the clinical practicum must be made up at the discretion of the hospital and the CLS Program Director. Remediation will be defined by the clinical instructor.

**Service Work**
Service work performed by a student in a clinical setting must be outside regular academic or clinical training hours, noncompulsory, paid, supervised on site, and subject to employee regulations. Students are not required to perform service work at any clinical affiliate nor will they be used as a substitute for regular laboratory staff.

**Confidentiality**
Students are expected to maintain confidentiality of patient information. It is imperative that patient information remain confidential and patient rights are protected.

**Transportation**
Students are responsible for their own transportation to and from clinical affiliates.
Essential Requirements for CLS Students
The student must be able to meet the following Essential Requirements to be admitted and continue in the CLS program in addition to the academic conduct set forth by the University Student Code of Conduct (http://judicialaffairs.tamucc.edu/studentcofc.html).

Technical Requirements
- Perform laboratory demonstrations in which biologicals (e.g. body fluids, culture materials, and cellular specimens) are tested for their biochemical, hematological, microbiological, and immunologic components
- Characterize the color, odor, clarity, and viscosity of biologicals, reagents, or chemical reaction products
- Employ a clinical grade binocular microscope to discriminate among fine structural differences of microscopic specimens
- Read and comprehend text, numbers, and graphs displayed in print and on a video monitor or other visual aid
- Use an electronic keyboard to operate laboratory instruments and to calculate, record, evaluate, and transmit laboratory information

Movement Requirements
- Move freely and safely about a laboratory
- Reach laboratory bench tops and shelves, patients lying in hospital beds or patients seated in specimen collection furniture
- Travel to numerous clinical laboratory sites for practical experience
- Perform moderately taxing, continuous physical work, often requiring prolonged sitting, over several hours
- Maneuver phlebotomy and culture acquisition equipment to safely collect valid laboratory specimens from patients
- Control laboratory equipment (e.g., pipettes, inoculating loops, test tubes) and adjust instruments to perform laboratory procedures

Communication Requirements
- Read and comprehend technical and professional materials (e.g., textbooks, magazines, journal articles, handbooks, and instruction manuals)
- Follow verbal and written instructions in order to correctly and independently perform laboratory test procedures
- Clearly instruct patients prior to specimen collection
- Effectively, confidentially, and sensitively converse with patients regarding laboratory tests
- Maintain patient confidentiality at all times
- Evaluate the performance of fellow students, staff, and healthcare professionals verbally and in a recorded format (writing, typing, graphics, or telecommunications)
- Use computer software (word processor, spreadsheet, database, information systems) and the internet for communication, education, and professional purposes
- Independently prepare papers, laboratory reports, and take paper, computer, and laboratory practical examinations

Intellectual Requirements
- Possess the intellectual skills of comprehension, measurement, mathematical calculation, reasoning, integration, analysis, comparison, self-expression, and criticism
• Solve problems and think critically
• Exercise sufficient judgment to recognize and correct performance deviations
• Critically evaluate own performance, accept constructive criticism, and look forward to improve (e.g., participate in enriched educational activities)

Behavior and Professional Requirements
• Dress to project a neat, well-groomed, professional appearance
• Conduct oneself in a professional manner toward fellow students, faculty, and patients
• Manage the use of time and systematize actions in order to complete professional and technical tasks within realistic constraints
• Possess the emotional health necessary to effectively employ intellect and exercise appropriate judgment
• Provide professional and technical services while experiencing the stresses of task-related uncertainty (e.g., ambiguous test ordering, ambivalent test interpretation), emergent demands, and a distracting environment (e.g., high noise levels, crowding, complex visual stimuli)
• Be flexible and creative and adapt to professional and technical change
• Recognize potentially hazardous materials, equipment, and situations and proceed safely in order to minimize risk of injury to patients, self, and others nearby
• Adapt to working with potentially offensive specimens, chemicals, and biologicals
• Support and promote the activities of fellow students and health care professionals
• Help foster a team approach to learning, task completion, problem solving, and patient care
• Be honest, compassionate, ethical and responsible
• Be forthright about errors or uncertainty

I feel that I can achieve the standards described above for the Clinical Laboratory Science Program.

_________________________  ____________________
Signature                                      Date