

# CLINICAL LABORATORY SCIENCE, BS

## Program Description

The Bachelor of Science in CLS degree prepares students to function as clinical laboratory scientists in a wide variety of settings including hospital laboratories, clinics, research labs, physician office laboratories, public health laboratories and reference labs. The requirements the first 3 years include courses in biology, chemistry, math, social sciences, and humanities. The senior year includes advanced study in the CLS disciplines along with clinical practice in the clinical facilities.

## Student Learning Outcomes

Students will:

- Possess a broad understanding of science and its in-depth applications, techniques, principles, and instruments used to their specific option within the clinical laboratory sciences major.
- Demonstrate critical thinking skills
- Practice the skills necessary to analyze and interpret test results through knowledge of physiological and pathological conditions that affect testing.

Admission to the CLS program is one time per year. Students must complete an application to the CLS program and submit to the Program Director before June 30. An interview may be requested. Students should consult their Academic Advisor for additional information.

## Clinical Laboratory Science Certification

The clinical laboratory scientist holds a key position in life-and-death matters involving the diagnosis and treatment of patients. Therefore, the practice of clinical laboratory science is regulated both from within the profession and, in some states, by law. In addition to the coursework for the baccalaureate degree, employment as a clinical laboratory scientist requires professional certification. A student may obtain one of three certifications in clinical laboratory science: generalist, clinical chemist, or medical microbiologist. Complete information (and an application for the certification examination in any area) may be obtained from the clinical laboratory science director. To apply for certification, a student must earn a "C" or better in all CLSC courses; and an interview and reference letters also may be required.

Clinical Laboratory Science at Texas A&M University-Corpus Christi is approved through the National Accrediting Agency for Clinical Laboratory Science (NAACLS).

## General Requirements

The Bachelor of Science in Clinical Laboratory Science degree requires a minimum of 120 semester hours: 42 are from designated Core Curriculum Program courses, 20 are from clinical laboratory core courses, 12-14 are required Foundation courses and 44 are Clinical courses. After their sophomore year (60 semester hours), students must have (and maintain) a cumulative GPA of 2.70 or above in their course work, with no course work older than 6 years. No "D" or "F" grades will be accepted as credit within the clinical laboratory core or clinical courses (see Notes).

Requirements	Credit Hours
First-Year Seminars (when applicable) <sup>1</sup> or Professional Skills	0-2
Core Curriculum Program ( <a href="http://catalog.tamucc.edu/undergraduate/university-college/programs/core-curriculum-program/">http://catalog.tamucc.edu/undergraduate/university-college/programs/core-curriculum-program/</a> )	42
Clinical Laboratory Core Courses	20
Required Foundation Courses	12-14
Clinical Courses	44
<b>Total Credit Hours</b>	<b>118-122</b>

<sup>1</sup> Full-time, first time in college students are required to take the first-year seminars.

- UNIV 1101 First-Year Seminar I (1 sch)
- UNIV 1102 First-Year Seminar II (1 sch)

## Program Requirements

Code	Title	Hours
Full-time, First-year Students <sup>1</sup>		
UNIV 1101	First-Year Seminar I *	1
UNIV 1102	First-Year Seminar II *	1
<b>Core Curriculum Program</b>		
University Core Curriculum		42
MATH 1442	Statistics for Life <sup>2</sup>	
<b>Clinical Laboratory Science Core Courses</b>		
BIOL 1406	Biology I	4
BIOL 1407	Biology II	4
BIOL 2416	Genetics	4
BIOL 2421	Microbiology	4
CHEM 1411	General Chemistry I *	4
CHEM 1412	General Chemistry II	4
CHEM 3411	Organic Chemistry I	4
<b>Required Foundation Courses</b>		
Although no specific courses are required, students will find familiarity with anatomy and/or physiology to be extremely beneficial.		
MATH 1442	Statistics for Life (included in University Core) <sup>2,*^A</sup>	1
BIMS 4406	Immunology	4
CHEM 4401	Biochemistry I	4
ELECTIVES - to reach 120		4-6
<b>Clinical Courses</b>		
CLSC 3102	Essentials Laboratory for Clinical Laboratory Science	1
CLSC 3200	Essentials for Applied Laboratory Sciences	2
CLSC 4120	Hemostasis	1
CLSC 4182	Seminar – Clinical Correlations <sup>3</sup>	1
CLSC 4200	Professional Skills for Clinical Laboratory Scientists	2
CLSC 4280	Introduction to the Clinical Laboratory Profession <sup>3</sup>	2
CLSC 4297	Professional Practicum I <sup>3</sup>	2
CLSC 4325	Clinical Chemistry I	3
CLSC 4326	Clinical Chemistry II	3

CLSC 4370	Clinical Microbiology I	3
CLSC 4371	Clinical Microbiology II	3
CLSC 4382	Advanced Medical Laboratory Procedures <sup>3</sup>	3
CLSC 4420	Hematology	4
CLSC 4430	Clinical Immunology	4
CLSC 4598	Professional Practicum II <sup>3</sup>	5
CLSC 4599	Professional Practicum III <sup>3</sup>	5
<b>Total Hours</b>		<b>129-131</b>

<sup>1</sup> Students entering with some college credit may not be required to take one or both of the First-Year Seminar courses (see The First Year Learning Communities Program (<http://catalog.tamucc.edu/undergraduate/university-college/programs/first-year-learning-communities-program/>) for rules and exceptions concerning these courses). Clinical Laboratory Science students must take CLSC 4200 Professional Skills for Clinical Laboratory Scientists (2 sch) whether or not they have taken none, one or both First Year Seminars.

<sup>2</sup> The 3 hours of lecture is included in the University Core of the Math Foundations area, and the 1 hour of lab is included in the Component Area Option.

<sup>3</sup> Admission to these courses is limited to students who have a minimum GPA of 2.7, and who have a "C" or better in all prerequisite Biology, Chemistry, and Biomedical Sciences courses. Full-time students will be given preference for admission to these courses.

\* Online offering

^ Blended offering

#### Notes:

1. If a student earns a grade of D, F or W in a CLSC course, that course must be repeated. A course in which a grade of less than C (i.e., D, F or W-withdrawal) was earned may be repeated only once.
2. A student who has earned a grade of less than C (i.e., D, F or W-withdrawal) in two CLSC courses or who has earned a grade of less than C (D, F or W-withdrawal) twice in the same CLSC course will be dismissed from the CLSC program.
3. Students receiving a grade of D, F or W (withdrawal) or I (Incomplete) in a CLSC course may not progress to courses for which that course is a pre-requisite.
4. Following dismissal, students may apply for reinstatement to the CLSC program. Reinstatement is competitive and is based upon space availability.
5. In order for students to progress through the program, they must be in compliance with immunizations and hospital orientation regulations.

## Courses

### CLSC 3102 Essentials Laboratory for Clinical Laboratory Science

#### 1 Semester Credit Hour (1 Lab Hour)

APPLICATION OF ESSENTIAL PRACTICES FOR CLINICAL LABORATORY SCIENCE.

**Co-requisite:** SMTE 0092.

### CLSC 3200 Essentials for Applied Laboratory Sciences

#### 2 Semester Credit Hours (1 Lecture Hour)

INTRODUCTION TO GENERAL LABORATORY PROCEDURES, LABORATORY SAFETY AND REGULATIONS, QUALITY ASSURANCE, PROFESSIONAL ETHICS, SPECIMEN ACQUISITION, SAMPLE MAINTENANCE AND MICROSCOPY. INCLUDES AN INTRODUCTION TO THE HEALTH CARE, PUBLIC HEALTH AND CRIMINAL INVESTIGATION SYSTEM.

**Prerequisite:** BIOL 1407 and CHEM 1412.

### CLSC 4120 Hemostasis

#### 1 Semester Credit Hour (1 Lecture Hour)

STUDIES OF BLOOD COAGULATION WITH AN EMPHASIS ON THE INTERACTION OF BLOOD VESSELS, PLATELETS, AND CERTAIN PLASMA PROTEINS. DISORDERS OF HEMOSTASIS WILL BE DISCUSSED ALONG WITH DIAGNOSTIC TESTING.

### CLSC 4182 Seminar – Clinical Correlations

#### 1 Semester Credit Hour (1 Lecture Hour)

INFORMAL LECTURES COVERING THE NEWEST DEVELOPMENTS IN LABORATORY MEDICINE. INCLUDES DISCUSSION OF THE PATIENT'S CLINICAL LABORATORY RESULTS, SELECTION AND INTERPRETATION OF LABORATORY TESTS, AND PRESENTATION OF RESEARCH.

### CLSC 4200 Professional Skills for Clinical Laboratory Scientists

#### 2 Semester Credit Hours (2 Lecture Hours)

STUDY OF THE ROLE OF THE MEDICAL LABORATORY PROFESSIONAL IN THE HEALTH CARE SYSTEM. INCLUDES PROFESSIONAL ETHICS, LEGAL RESPONSIBILITY, MEDICAL LABORATORY MANAGEMENT, INSTRUCTIONAL METHODS, EVALUATION OF CLINICAL LABORATORY METHODS, MEDICAL LABORATORY INSTRUMENT SELECTION, CLINICAL RESEARCH AND CURRENT PROFESSIONAL TOPICS. REQUIRES PERMISSION OF INSTRUCTOR AND APPLICATION.

### CLSC 4280 Introduction to the Clinical Laboratory Profession

#### 2 Semester Credit Hours (2 Lecture Hours)

STUDIES OF THE LATEST INSTRUMENTATION, INSTRUMENT SELECTION, BASIC RESEARCH, QUALITY ASSURANCE AND STATISTICS USED IN THE CLINICAL LABORATORY.

**Prerequisite:** (CLSC 3200, CHEM 4401 and MATH 1442).

### CLSC 4297 Professional Practicum I

#### 2 Semester Credit Hours (2 Lecture Hours)

SUPERVISED LEARNING EXPERIENCE IN SELECTED DEPARTMENTS OF THE CLINICAL LABORATORIES.

### CLSC 4325 Clinical Chemistry I

#### 3 Semester Credit Hours (3 Lecture Hours)

PRINCIPLES AND PRACTICE OF PROCEDURES FOUND IN GENERAL CLINICAL CHEMISTRY. INCLUDES THE METHODOLOGY OF DIAGNOSTIC TESTS AND NORMAL AND ABNORMAL HUMAN PHYSIOLOGY AS APPLIED TO DIAGNOSIS OF PATHOLOGICAL CONDITIONS.

**Prerequisite:** CHEM 4401.

**Co-requisite:** SMTE 0092.

### CLSC 4326 Clinical Chemistry II

#### 3 Semester Credit Hours (3 Lecture Hours)

CONTINUATION OF CLSC 4325 - CLINICAL CHEMISTRY I. EMPHASIS ON ADVANCED CLINICAL CHEMISTRY TOPICS AND PROCEDURES.

**Prerequisite:** CLSC 4325.

**CLSC 4370 Clinical Microbiology I****3 Semester Credit Hours (3 Lecture Hours)**

LECTURE AND LABORATORY STUDIES OF COMMON PATHOGENIC BACTERIA. EMPHASIS IS ON STAINING, CULTURAL, AND DIFFERENTIAL BIOCHEMICAL CHARACTERISTICS, METHODS OF ISOLATION FROM BODY FLUIDS AND SUSCEPTIBILITY TO THERAPEUTIC AGENTS.

**Prerequisite:** BIOL 2421.

**Co-requisite:** SMTE 0092.

**CLSC 4371 Clinical Microbiology II****3 Semester Credit Hours (2 Lecture Hours, 3 Lab Hours)**

LECTURE AND LABORATORY STUDIES OF PARASITIC, VIRAL, MYCOLOGICAL AND UNUSUAL BACTERIAL HUMAN PATHOGENS. EMPHASIS ON METHODS OF ISOLATION FROM BODY FLUIDS, IDENTIFICATION METHODS AND CORRELATION WITH PATHOLOGY.

**Prerequisite:** CLSC 4370.

**CLSC 4382 Advanced Medical Laboratory Procedures****3 Semester Credit Hours (3 Lecture Hours)**

LECTURE AND LABORATORY STUDIES OF THE NEWEST DEVELOPMENT IN LABORATORY DIAGNOSTIC MEDICINE. INCLUDES ADVANCED CLINICAL CHEMISTRY, IMMUNOLOGY AND MOLECULAR DIAGNOSTIC PROCEDURES.

**Prerequisite:** CLSC 4325 and BIMS 4406 or BIOL 4406 and CHEM 4401.

**CLSC 4420 Hematology****4 Semester Credit Hours (4 Lecture Hours)**

STUDIES OF THE FORMATION, FUNCTION AND IDENTIFYING CHARACTERISTICS OF THE CELLULAR ELEMENTS OF HUMAN BLOOD AND OTHER BODY FLUIDS IN HEALTH AND DISEASED STATES AND LABORATORY STUDIES ON BLOOD COAGULATION. LECTURE AND LABORATORY EMPHASIZE THE ENUMERATION, MORPHOLOGY AND STAINING CHARACTERISTICS OF NORMAL AND ABNORMAL CELLS AND HEMOSTASIS.

**Prerequisite:** BIOL 2416 and CHEM 4401.

**Co-requisite:** SMTE 0092.

**CLSC 4430 Clinical Immunology****4 Semester Credit Hours (4 Lecture Hours)**

THEORETICAL ASPECTS OF THE IMMUNE RESPONSE AND ITS RELATIONSHIP TO THE DIAGNOSIS OF DISEASE AND CLINICAL IMMUNOHEMATOLOGY. LECTURE AND LABORATORY STRESS THE DETECTION, IDENTIFICATION AND CHARACTERIZATION OF ANTIBODIES, BLOOD GROUPING AND TYPING, COMPATIBILITY TESTING, BLOOD COMPONENT THERAPY, HLA TESTING AND DIAGNOSIS OF PATHOLOGICAL CONDITIONS.

**Prerequisite:** BIMS 4406 or BIOL 4406.

**Co-requisite:** SMTE 0092.

**CLSC 4598 Professional Practicum II****5 Semester Credit Hours (5 Lecture Hours)**

CONTINUATION OF CLSC 4297 - PROFESSIONAL PRACTICUM I. SUPERVISED LEARNING EXPERIENCE IN SELECTED DEPARTMENTS OF THE CLINICAL LABORATORIES.

**Prerequisite:** CLSC 4297.

**CLSC 4599 Professional Practicum III****5 Semester Credit Hours (5 Lecture Hours)**

CONTINUATION OF CLSC 4598 - PROFESSIONAL PRACTICUM II. SUPERVISED LEARNING EXPERIENCE IN SELECTED DEPARTMENTS OF THE CLINICAL LABORATORIES.

**Prerequisite:** CLSC 4598.