

Associate of Applied Science in Cannabis Laboratory Sciences

Length: **20 Months**

Credential: Associate of Applied Science Degree

The Cannabis Laboratory Sciences program is an academic associate of applied science degree that is designed to prepare students for direct entry into clinical testing laboratories. This program consists of curriculum that emphasizes clinical biology and chemistry sciences to provide the core knowledge of clinical laboratory sciences as well as foundational knowledge of cannabis testing. This degree also prepares students for science-related positions in pharmaceuticals, medical manufacturing, clinical chemistry, cannabis cultivation, manufacturing and testing laboratories. Coursework includes clinical chemistry, biology, microbiology, and fundamentals in cannabis extractions and concentrates. The program also provides general education coursework in oral and written communication. In addition to attendance in all courses, students will be required to complete out-of-class assignments. These assignments include but are not limited to reading, exercises and problem solving, projects, research, papers, and presentations. A student can anticipate out-of-class activities that equal about two (2) hours for every one (1) hour of lecture, and about one (1) hour for every one (1) hour of lab. Upon successful completion of the program (see Graduation Requirements section of the catalog), graduates can operate and maintain equipment in the medical laboratory, collect and analyze specimen samples for testing and could seek, or obtain entry-level employment in a laboratory technician related field.

Program Outcomes:

At the completion of this program, students should be able to:

- ✓ Broad core knowledge in clinical chemistry and microbiology
- ✓ Develop a foundational knowledge of cannabis extractions and concentrates
- ✓ Develop a strong and general knowledge base of information through the General Education courses;
- ✓ Develop and demonstrate communication effectively in written, oral formats;

Course Code	Course Title	Contact Hours	Semester Credit Hours
Core Concentration Requirements			
BIO210	Biology	75	4.0
BIO215	Physiology	60	4.0
CHEM240	Chemistry	75	4.0
ML160	Clinical Chemistry I	60	3.0
ML170	Clinical Microbiology I	60	3.0
ML210	Professional Interpening	45	3.0
ML240	Extractions & Concentrates Fundamentals	60	4.0
ML265	Clinical Chemistry II	60	3.0
ML275	Clinical Microbiology II	60	3.0
ZO101	Medical Terminology	45	3.0
ZO201	Pharmacology	45	3.0
	Subtotal	660	37.0
General Education Requirements			
EH102	Speech	45	3.0
EH111	College Composition	45	3.0
HY103	US History 1865 to Present	45	3.0
MS110	College Algebra	45	3.0
PY101	Introduction to Psychology	45	3.0
ZO115	Human Anatomy and Physiology of the Structural Systems	75	4.0
ZO116	Human Anatomy and Physiology of the Organ System	75	4.0
	Subtotal	375	23.0
	Grand Total	1,035	60.0

BIO210 Biology**4 Semester Credit Hours**

Prerequisites: None

Topics covered in the course include: chemistry of life, cell structure and membranes, cellular functions (metabolism, respiration, photosynthesis, communication, and reproduction), genetics (inheritance patterns, DNA structure and function, gene expression, and biotechnology), and evolution. This course involves both lecture and lab components.

BIO215 Physiology**4 Semester Credit Hours**

Prerequisites: ZO115, ZO116

The focus of this course will be the nervous system, muscle physiology, and special senses. Discussions will include ion movement, action potentials, synapses & receptors, the central, peripheral and autonomic nervous systems, excitation-contraction coupling in skeletal muscle and the mechanisms specific to vision, hearing, smell & taste, in addition to the somatosensory system.

CHEM240 Chemistry**4 Semester Credit Hours**

Prerequisites: None

Principles of chemistry dealing with the structure of matter, periodic system, chemical bonding, formulas and equations are studied in this course. Laboratory work provides an opportunity to see the applications of these chemical principles. This course involves both lecture and lab components.

EH102 Speech**3 Semester Credit Hours**

Prerequisite: None

This basic speech course is designed to present the principles and basic skills for effective speaking and to provide an appreciation of the values and uses of spoken communication. Students will learn to present informative and demonstration speeches, and speeches for special occasions.

EH111 College Composition**3 Semester Credit Hours**

Prerequisite: None

This course introduces the essentials of prose writing, generation of ideas, organization and the writing process. Grammatical accuracy, sentence structure and use of supporting details are stressed. Students practice these concepts first by reading and analyzing prose models and then by writing paragraphs and translating to longer essay themes of various lengths using the following strategies: narration, description, definition, process, divide and classify, cause and effect, compare and contrast, and argument. A research paper demonstrating proper referencing and documentation is also included.

HY103 U.S. History 1865 to the Present**3 Semester Credit Hours**

Prerequisite: None

This course explores the major social and cultural trends, demographic and economic shifts, and international alliances, frictions, and conflicts that have characterized the American experience since the Civil War. By tracking critical themes like race, politics, technology, environment, and religion, students will learn to think historically, read critically, and model effective approaches to research, writing, and civic engagement for a digital age.

ML160 Clinical Chemistry I**3 Semester Credit Hours**

Prerequisite: None

An introduction to analytical techniques, instrumentation, and basic principles of clinical chemistry methods. Presents the theory and application of biochemical analytes, including clinical significance and normal reference ranges. This course involves both lecture and lab components.

ML170 Clinical Microbiology I**3 Semester Credit Hours**

Prerequisite: None

This course will include basic concepts of microbiology. Emphasis will be placed on cell structure and function of human, pathogenic microorganisms. Disease, resistance, and immune system function will be included. Methods of microbe control will be introduced. A student laboratory will be utilized for experiences in fundamental microbiology techniques. This course involves both lecture and lab components.

ML210 Professional Interpening**3 Semester Credit Hours**

Prerequisite: None

This course is designed to provide students principles in evaluating cannabis flower for total quality control, psychotropic effects, and variety type designation. The course will focus on cannabis origins and history, speciation controversy, strain name dilemma, cannabis anatomy, chemistry of cannabinoids and terpenes, unacceptable physical and aroma characteristics, aroma perception technique, and predictors of psychotropic effects.

ML240 Extractions & Concentrates Fundamentals

4 Semester Credit Hours

Prerequisite: None

This course will provide understanding of cannabis extraction techniques and the products they produce. Emphasis will be placed on extraction methods including solvent extractions, ethanol, hydrocarbon, CO₂, solventless/mechanical extractions, hash/bubble hash, rosin, post-processing, solvent recovery, decarboxylation, winterization, distillation/isolation. The course will provide further understanding of the types of Concentrates, and flower vs. concentrates.

ML265 Clinical Chemistry II

4 Semester Credit Hours

Prerequisite: ML160

Expanding upon concepts learned in Clinical Chemistry I, this course further examines the principles and procedures of various tests performed in Clinical Chemistry. Integral to this course is continued explanation of the physiological basis for the test, the principle and procedure for the test, and the clinical significance of the test results, including quality control and normal values. This course involves both lecture and lab components.

ML275 Clinical Microbiology II

3 Semester Credit Hours

Prerequisite: ML170

Expanding on concepts learned in Clinical Microbiology I, this course provides further instruction in basic microbiology with emphasis placed on viruses, fungi, and parasites. Epidemiology and infection control will be introduced. A student laboratory will be utilized for experiences in fundamental microbiology techniques. This course involves both lecture and lab components.

MS110 College Algebra

3 Semester Credit Hours

Prerequisite: None

This course includes a study of the fundamental algebraic processes. Topics will include real and rational numbers, radicals, monomials and polynomials, solution of first- and second-degree equations, inequalities, systems of linear equations in two and three unknowns, graphing of functions in Cartesian Coordinates, logarithms, determinants, and word problems.

PY101 Introduction to Psychology

3 Semester Credit Hours

Prerequisites: None

The student, introduced to the nature and objectives of psychology, develops an appreciation of psychological research and findings. This course focuses on individual development--heredity and environment, conditioning processes, conflict and anxiety and defense mechanisms. Consideration is also given to interaction through social processes (group dynamics) in terms of dealing with reality and eventual self-actualization.

ZO101 Medical Terminology

3 Semester Credit Hours

Prerequisites: None

This course is designed to give the student a written and oral vocabulary of the medical language. Emphasis is placed on spelling, speaking, building, and defining medical terms through study of medical root elements, suffixes, prefixes and combining forms. Audiovisual aids, case histories and surgical reports help develop this course. Major body system terminology will be presented, as well as diagnostic procedures and basic pharmacological terminology.

ZO115 Human Anatomy and Physiology of the Structural Systems

4 Semester Credit Hours

Prerequisite: None

In this course, basic bio-organization and six areas of the body structural systems are studied. The gross and microscopic structures and function of integumentary system, skeletal system, muscular system, nervous system, endocrine system and special senses are explored. Emphasis is placed on the diseases and diagnostic procedures related to each of these systems. This course involves both lecture and lab components.

ZO116 Human Anatomy and Physiology of the Organ Systems**4 Semester Credit Hours**

Prerequisite: None

The gross and microscopic structures and function of the blood, the male and female reproductive systems, cardiovascular system, lymphatic system, respiratory system, digestive system, and urinary system are explored. Emphasis is placed on the diseases and diagnostic procedures related to each system. This course involves both lecture and lab components.

ZO201 Pharmacology**3 Semester Credit Hours**

Prerequisites: ZO101

This course presents the student with general concepts of pharmacology and drug administration throughout the life span. Basic information about drug classifications, drug side effects, drug interactions, the use and abuse of drugs and drug reactions is covered. Emphasis is placed on the mechanism of action and effect of commonly prescribed drugs for each body system. The metric and apothecary systems, dosage applications/calculations, prescription translation, and charting will also help develop the course.