

Bachelor of Science in Applied Biochemistry

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PROGRAM DESCRIPTION



Applied Biochemistry focuses on knowledge and techniques in biochemistry that can be applied to solve challenges relating to improving health and nutrition, forensics, increasing agricultural and manufacturing productivity and sustaining the environment. The program focuses on three main areas: Industrial Biochemistry which focuses on application of biological molecules for medical, industrial, environmental, agricultural for analytical purposes; Medical Biochemistry which equips students with knowledge, skills, attitude and understanding of the fundamental importance of biochemistry, with particular reference to the ways in which this relates to health issues, molecular basis of disease, biochemical basis of drug based therapy and an understanding in development of new medical treatments, and Forensic Biochemistry which equips students with knowledge and skills of how to obtain evidence from biological materials for use in law enforcement, criminal justice, homeland security and related fields. program is thus aligned to the University's philosophy as articulated in the mission outcomes of higher order thinking; literacy; global understanding and multicultural perspective; preparedness for career; community service; and leadership and ethics.

The goal of the program is to develop a critical mass of graduates with biochemical knowledge, the state-of-the-art skills, and professional attitude that can match the needs of industries, health care facilities, learning and research institutions.

PROGRAM LEARNING OUTCOMES

Upon completion of the Bachelor of Science in Applied Biochemistry program, students will be able to:

- · Analyze the cellular processes that govern life;
- Use integrated knowledge in biological chemistry to solve biochemical problems;
- Conduct biomedical research and communicate scientific information using set standards for reporting and citation;
- Apply biochemical knowledge and techniques in criminal justice, agriculture, manufacturing and business processes;
- Design innovative biochemical products and services using ethically-sound practices.

DEGREE REQUIREMENTS 187.5 UNITS

GENERAL EDUCATION	39 UNITS
SIGNATURE COURSES	12 UNITS
STRATEGIES FOR UNIVERSITY SUCCESS SUS 1010 Strategies for University Success	3 UNITS
RESEARCH METHODS GRM 2000 Introduction to Research Methods	3 UNITS
COMMUNITY SERVICE OR COMMUNITY PROJECT CMS 3700 Community Service	3 UNITS
THE SENOIR EXPERIENCE SEN 4800 Integrated Seminar	3 UNITS
WRITTEN, ANALYTICAL, CRITICAL THINKING SKILLS	12 UNITS
ENG 1106 Composition I (WI)	6 UNITS

FOREIGN LANGUAGE 6 UNITS

ENG 2206 Composition II (WI)

Student must have a credit transfer for a foreign language or must take up to two- course foreign language sequence of one language. USIU-Africa offers courses in Arabic, French, Japanese, Spanish, Swahili and Chinese.

QUANTITATIVE AND TECHNOLOGICAL SKILLS 6 UNITS

IST 1010 Introduction to Information Systems

MTH 1109 College Algebra

GENERAL EDUCATION ELECTIVES

9 UNITS

(Choose three courses- at least two should be from lower levels)
ENT 1010 Introduction to Entrepreneurship (Lower elective)
SOC 2201 Introduction to Sociology (Lower Elective)
PHL 3310 Ethics and Value Theory (Upper Elective)
BUS 4090 Strategic Management (Upper Elective)

CORE COURSES

154.5 UNITS

CHE 1100	Foundations of Chemistry
BCM 1341	Cellular Biology
BCM 1320	Laboratory Practice and Instrumentation
CHE 140	Fundamentals of Physical Chemistry
CHE 1110	Chemistry of the Main Group Elements
CHE 1300	Fundamentals of Organic Chemistry
CHE 2300	Carbonyl Compounds and Derivatives
BCM 1310	Structure and Function of Biomolecules
BCM 1330	Vitamins, Minerals and Trace Elements
BCM 2105	Enzymology
BCM 2120	Carbohydrate, Lipid Metabolism and
	Associated Disorders
BCM 2110	Membrane Biochemistry and cellular signaling
MIC 2175	Bacteriology
BCM 2140	Introduction to Plant Biochemistry
BCM 2220	Immunochemistry and Hematology
BCM 2250	Protein biochemistry and Nitrogen
	metabolism and Associated Disorders
MIC 2260	Introduction to Parasitology and Disease Vectors
BCM 2280	Molecular Biology
MIC 2380	Principles of Microbiology
BCM 2325	Regulation and Integration of Metabolism
BCM 2330	Biochemical Endocrinology
BCM 2340	Genetics and Evolution
BCM 3325	Quality Control and Quality Analysis
BCM 3110	Microbial Biochemistry
BCM 3120	Basic Chemometrics
BCM 3130	Nutritional Biochemistry
BCM 3140	Biochemistry of Plant Secondary Metabolism
	and Phytohormones
BCM 3150	Bioethics and Biosafety in Biomedical Research
BCM 3200	Medical Genetics

BCM 3210	Gene Technology and Biotechnology
BCM 3230	Industrial Biochemistry
BCM 3250	Principles of Bioinformatics
BCM 3260	Biochemistry of Specialized Organs and Tissues
BCM 3300	Clinical Biochemistry
PHT 3350	Principles of Pharmacognosy
BCM 3330	Integrated Laboratory Skills Workshops
BCM 3360	Comparative Biochemistry
SEN 4800	Integrated Senior Seminar
BCM 4100	Bioremediation and Waste Management
BCM 4120	Principles of Forensic Biochemistry

BCM 4400 Research Project in Biochemistry



ADMISSION REQUIREMENTS

To obtain admission into the program, an applicant must satisfy one of the following requirements:

 Kenya Certificate of Secondary Education (KCSE) or its equivalent with mean grade C+ and attained the minimum grade of C+ in the cluster subjects;

OPTION A

Biology Chemistry Mathematics/Physics English

OPTION B

Biological Sciences /Chemistry Physical Sciences /Mathematics English

- Kenya Advanced Certificate of Education (KACE) with two principal passes in Biology or Chemistry and Mathematics and a subsidiary. or
- Holders of BSc. General from accredited institutions shall undertake selected courses of the program subject to the allowable credit transfer. They must also have taken Chemistry and Biological Science courses.

CAREER OPTIONS

Graduates will venture into careers in research institutions, medical laboratory technicians, food and beverages and quality assurance industries, academia, pharmaceutical companies, nutritional counseling, forensic laboratory technicians and self-employment in a biochemical/ biotechnological entrepreneurship.

CONTACTS

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Accredited in Kenya & the United States of America by the Commission for University Education (CUE) and WASC Senior College and University Commission respectively.