

Bachelor of Science in Medical Biochemistry

Biochemistry is a subject in life sciences that aims at imparting on understanding the Molecular Basis of life in plant and animal health. It is a multi-disciplinary subject that focuses on structure and function of molecules as well as their interplay to create the phenomenon of life. The subject particularly looks at how molecular interplay is translated into metabolisms, energy transduction, defense and physical responses for purposes of health, growth and development.

The Molecular basis of the ongoing struggle between higher organisms and disease is aptly captured in subjects like Medical Biochemistry, Biochemistry of microorganisms, parasitology and tumors as well as Cell and Molecular Immunology. Strategies designed to control disease and improve health for all are adequately addressed in the areas of pharmacology, pharmacognosy, environmental and nutrition Biochemistry. These areas of specialization form part of recent advances in biochemistry and are covered in this programme. This is in line with the vision which is endeavor to be a world class centre of excellence in training, research and innovation and mission which is commitment to offering quality training and research on recent advances in Biochemistry and Biotechnology to both graduates and undergraduates focused towards meeting the needs of the ever changing world.

PROGRAMME OVERVIEW

The degree programme will provide students with basic knowledge in Research Methodologies and computer skills and foundation courses. The Students will acquire practical skills and theoretical understanding of various aspects of Medical, Nutritional and Environmental biochemistry. Other areas included in the programme are Cell and Molecular Immunology, Industrial and Biochemical Pharmacology and Parasitology. These courses are designed to expose students to a wider perspective of the application of Biochemistry in health.

COURSE OBJECTIVES

- 1 The students will be able to describe basic principles of Biochemistry and Biomedical Sciences.

- 2 They will be equipped with practical skills on recent advances on methodologies and practice in Biochemistry and Biomedical Sciences.
- 3 The students will acquire adequate Computer and Research Methodology skills necessary for computing and presenting biological data.

COURSE JUSTIFICATION

Kenya and other developing countries need to develop its scientific base in order to find effective and logically relevant solutions to problems of in the fields of health, industrial development and environmental protection. Biochemistry has advanced to include areas such as Cell and Molecular Immunology, Biochemical Pharmacology, Molecular Parasitology, Medical and Nutritional Biochemistry. All these areas are currently playing a significant role in research directed towards provision of better medicine and health for all. Medical Biochemistry therefore remains an essential discipline and continues to play a catalytic role. Courses addressing the areas mentioned are part of this programme, making it unique among other similar programmes in the country.

Consequently students graduating from this programme are qualified to work in local and international institutions engaged in multi-disciplinary life sciences research and teaching. Others will be able to develop careers in production, quality assurance and technical sales in the pharmaceutical sector, cosmetics industries, hospital diagnostics and environmental health protection departments. The institutions and companies form an important part of Kenya's production and health services sectors.

Regulations for the Degree of Bachelor of Science in Medical Biochemistry

1.0 Entry Requirements

Students wishing to study Medical Biochemistry must satisfy the minimum University requirements and Faculty/School entry requirements. A student to be admitted must satisfy any of the following minimum requirements;

Either

- 1.1 Must have passed Biology or Biological Sciences and chemistry in KCSE at a minimum grade of C+. In addition a student must have passed either

mathematics or physics/Physical Science with a minimum grade of C. A student who has not attained the said grade in mathematics or physics or physical science must undertake and pass the respective bridging course in an institution recognized by the university senate in order to be considered for the degree programme.

1.2 have a minimum of 2 principal passes in biology and chemistry subjects in Kenya Advanced Certificate of Education (KACE) or equivalent,

or

1.3 have a diploma in relevant science subjects and with at least a Contact pass from an Institution recognized by the University Senate,

or

1.4 have a diploma in Applied Sciences with at least a Contact pass in relevant science subjects from an Institution recognized by the University Senate,

or

1.5 have any other qualifications accepted by the University Senate as equivalent to 1.1 to 1.4.

Students who hold any of the qualifications 1.2, 1.3 and 1.4 above may at the discretion of the Faculty/School be admitted directly to the second year of the course in which case they may complete their course in a minimum of three academic years and a maximum of five academic years.

1.6 Students who join first year of study in the Bachelor of Science general programme, must take Chemistry and Biological science courses and other prescribed courses in biochemistry to be eligible for Medical Biochemistry in second year. The students must obtain an average of B in the relevant first year units and admission is subject to availability of facilities and its at the discretion of the department.

2.0 Course Structure

2.1 In each year a student will be required to take twelve (12) core units. In addition each student will be required to take three (3) University units and one (1) Faculty unit in the first year and one (1) University unit in the fourth year of study.

2.2 A student who takes additional unit(s) will have the grade(s) indicated in the transcript but will not count towards classification of the degree.

2.3 Unless otherwise stated each course is one unit.

Course Distribution

First Year

Course code	Unit Title
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First

semester

HRD 2101	Communication skills
SMA 2104	Mathematics for science
SZL 2111	HIV/AIDS
HBB 2100	Structure of Biomolecules
HBB 2104	The Cell and external environment
HBB 2109	Laboratory safety and Procedures
SCH 2100	Atomic structure
SCH 2102	Physical chemistry I

Second	Semester
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HBB 2101	Proteins and enzymes I
HRD 2102	Developmental studies and social ethics
SCH 2101	Chemical bonding and structure
HBB 2103	Basic Metabolism I
SCH 2103	Organic chemistry I
HBB 2102	Medical physiology
SZL 2101	Histology and cytology
SZL 2205	Genetics and cytogenetics

**Second Year
Code****Unit Title****First semester**

HBB 2106	Biochemistry of Microorganisms I
HBB 2202	Biochemical Techniques and Instrumentation I
HBB 2205	Cell and Molecular Biology
HBB 2214	Principles of Laboratory Management and Quality Systems
SCH 2200	S&P Block Elements
SCH 2201	Physical Chemistry I
ICS 2240	Introduction to Computer and Data Processing

Second semester

SCH 2202	Organic Chemistry II
SCH 2203	Nuclear Chemistry and Radio chemistry
HBB 2211	General Pathology
HBB 2212	Molecular Pharmacology
HBB 2213	Diseases of Connective Tissue and Bone
ICS 2241	Introduction to Programming

Third Year**Core Units**

HBB 2200	Basic Metabolism II
HBB 2301	Basic Metabolism III
HBB 2302	Biochemical Techniques and Instrumentation II
HBB 2304	Protein and Enzymes II

HBB 2307 Biostatistics and Research Methodology

HBB 2337 Medical Entomology

HBB 2338 Medical Biotechnology I

Electives

HBB 2208 Biochemistry of Microorganisms II

HBB 2303 Biochemical Endocrinology

HBB 2306 Cell and Molecular Immunology I

HBB 2322 Biochemical Pharmacology I

HBB 2324 Medical Pathogens

HBB 2327 Pharmacognosy

HBB 2335 Clinical Biochemistry I

HBB 2336 Food Toxicology

Fourth Year

Code

Unit Title

Core Units

HRD 2401 Entrepreneurship Skills

HBB 2401 Biochemical Techniques and Instrumentation
III

HBB 2407 Nutritional Biochemistry

HBB 2429 Introduction to Bioinformatics

HBB 2441 Principles of Tissue Culture

HBB 2442 Medical Biotechnology II

HBB 2443 Epidemiology

Elective

HBB 2406 Research Project (2 Units)

HBB 2423 Biochemical Pharmacology II

HBB 2425 Cell and Molecular Immunology II

HBB 2427 Biochemistry of Tumours

HBB 2431	Medical Parasitology
HBB 2432	Medical Industrial Biochemistry
HBB 2436	Therapeutic proteins
HBB 2435	Principles of Forensic Biochemistry