

COURSE STRUCTURE

The M.Sc degree programme involves course work lectures in ten (10) core course units and six (6) elective units in an appropriate area of speciality, in addition to undertaking a project which is equivalent to four (4) course units within the course duration of 24 months.

The PhD Degree is by research in an appropriate area of specialization on submission of a thesis within a period of 36 months.

COURSE DURATION

Master of Science in Biotechnology and Bioinformatics - 24 months
Doctor of Philosophy (PhD) in Biotechnology and Bioinformatics -36 months.

FEE STRUCTURE (PER ANNUM)

- a) Master of Science in Biotechnology and Bioinformatics
Kenyan students : Kshs. 380,000
Foreign students :US\$ 6,500
- b) Doctor of Philosophy (PhD) in Biotechnology and Bioinformatics
Kenyan students : Kshs. 380,000
Foreign students :US\$ 6,500

CAREER PROSPECTS

- Academic Institutions
- Research Institutions
- Industry
- Public and Private Sector
- International Organizations

For further details please contact:

The Director

Centre for Biotechnology and Bioinformatics (CEBIB)
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UNIVERSITY OF NAIROBI

CENTRE FOR BIOTECHNOLOGY AND BIOINFORMATICS

POST GRADUATE DEGREE PROGRAMMES

- Master of Science in Biotechnology
- Master of Science in Bioinformatics
- PhD in Biotechnology

Course Programme Highlights

Biotechnology

Agriculture and Environmental Biotechnology

- Plant and Crop Biotechnology
- Molecular Taxonomy and Phylogenetics
- Food and Feed Safety
- Plant and Animal Breeding
- Molecular Phenotyping and Model Systems
- Biopolicy, Biosafety and Intellectual Property

Health and Environmental Biotechnology

- Pharmacology Drug Delivery and Pharmacogenomics
- Diagnostics and Vaccinology
- Forensic Sciences
- Immunotechnology and Molecular Diagnostics
- Molecular Epidemiology and Dynamics of Diseases

- Emerging infections and Poverty Related Diseases

Industrial and Environmental Biotechnology

- Environmental Microbial Bioremediation
- Food and Fermentation Technologies
- Industrial Enzymes Technologies
- Biomaterial Technologies
- Natural Products and Drug Discovery

Bioinformatics

- Applied Bioinformatics in Breeding, Genomics and Proteomics
- Designs of Microarrays Experiments
- Computational Methods in Biosciences

www.uonbi.ac.ke

1.0 Background

The establishment of Centre for Biotechnology and Bioinformatics (CEBIB) at the College of Biological and Physical Sciences, Chiromo Campus was approved by University of Nairobi, Senate on 17th August 2005. CEBIB is being established as a centre of excellence, a shared research facility, to facilitate capacity building and generate marketable products, through exploitation of Biotechnology and Bioinformatics.

1.1 Overview

The Centre for Biotechnology and Bioinformatics (CEBIB) serves as a shared facility to facilitate and strengthen research and product development in biotechnology and bioinformatics within the University and the region. CEBIB formation underscores the realization that biotechnology/bioinformatics is an interdisciplinary subject with wide ranging applications of scientific and engineering principles in different fields such as agriculture, food & feed, medicine, industry and the environment, which are of profound importance to mankind.

The center's strategy is to facilitate integration of fundamental research into production and product processing while enabling rapid transfer of research innovations into the commercial domain.

1.2 Vision

To be a leading center in Education, Research and Entrepreneurship in Biotechnology and Bioinformatics, guided by sound scientific and ethical principles, and committed to the virtues of quality and relevance and thus contribute to the dynamic socio- economic and cultural development of Kenya, East Africa, Africa and the world at large.

1.3 Mission

To maintain a leadership role in the pursuit of knowledge through quality and relevant teaching, research development, consultancy and community service as well as promoting entrepreneurship in Bioinformatics and Biotechnology.

1.4 CEBIB Objectives

1. To strengthen national capabilities in the field of basic sciences and technology and in the development of research in biotechnology and bioinformatics.
2. To promote and conduct basic research in the areas of molecular biology and biotechnology and bioinformatics.
3. To facilitate the application of biotechnology in research and encourage its use for the development of marketable products.
4. To offer training facilities for manpower development in biotechnology and bioinformatics at the national and regional level.
5. To co-ordinate biotechnology and bioinformatics activities at the University of Nairobi and liaise with government, private sector and international institutions in the promotion and application of biotechnology and bioinformatics in agriculture, livestock medicine, industry and environment. CEBIB postgraduate students in the
6. To institutionalize links between universities, scientific research institutions, and

- Bioactive Natural Products
- Probiotics for Dairy Industry
- Microorganisms for Biocontrol and Management
- Industrial Biocatalysts

Strengthening Regional and International Cooperation and Networks

CEBIB ensures excellence in science and technology through establishment of linkages with other institutions globally. Regional and International Cooperation is essential to ensure that International Standards are achieved and maintained at CEBIB. In addition, the strategy includes participation in appropriate regional and international fora - to promote CEBIB activities. CEBIB creates linkages to maximize on student training and faculty exchange for experience and development.

Administration

The Centre for Biotechnology and Bioinformatics operates under the guidance of Academic and Research Advisory Board and a full-time Director who is the Chief Executive Officer and follows administrative as outlined below:

The set up is as follows:

- Director (Full-time)
- Research Unit Heads
- (Training, Research, Production)
- Research Scientists, Technologists, etc. (Full-time)



Masters students working on their research projects in CEBIB Molecular laboratory. Candidates are required to submit a written project report to CEBIB for examination.

- Industrial Enzyme Technologies
- Biomaterial Technologies
- Natural Products and Drug Discovery

Bioinformatics:

- Applied Bioinformatics in Breeding, Genomics and Proteomics
- Designs of Microarrays experiments
- Computational Methods in biosciences

Eligibility

(a) For Master of Science (MSc) Program

1. Holders of degree of the University of Nairobi in Bachelor of Medicine, Bachelor of Veterinary Medicine, Bachelor of Pharmacy, Bachelor of Dentistry or an equivalent qualification from a University recognized by Senate.
2. Holders of an Upper Second Class degree in Sciences, Engineering or Agriculture or an equivalent qualification from a University recognized by Senate.
3. Holders of Lower Second Class or Pass degree in Sciences, Engineering or Agriculture or an equivalent qualification from a University recognized by Senate plus 3 years relevant research experience.

(b) For Doctor of Philosophy (PhD) Program

Holders of a Master of Science degree in Biological & Physical Sciences, Bioinformatics, Medicine, Veterinary Medicine, Pharmacy, Dentistry or an equivalent qualification from a University recognized by Senate.

CEBIB Training Program Output

CEBIB training program generates human resource (with expertise in all aspects of biotechnology) with the capacity to provide services in all sectors of research and training pertaining to biotechnology. It also provides infrastructure through its state-of-the-art facilities. The trained manpower promotes science industries through technology transfer as well as collaborations with industry.

The graduates also implement biosafety guidelines for genetically modified organisms and recombinant DNA products for societal benefits.

Research Activities

- Strategies for Plant and Crop Improvement
- Strategies for Animal Improvement
- Strategies for Disease Management
- Biomaterials for Industrial Applications
- Technologies for Environmental Bioremediation and Management
- Applications of Bioinformatics

Product Development

- Tissue & Cell Culture Products
- Diagnostics and Vaccines Products

private enterprises.

7. To network with institutions in developed and developing countries as well as the International Centres of Biotechnology and Bioinformatics globally.

CEBIB Training Program

The mission of CEBIB training program is to maintain a leadership role in pursuit of knowledge through quality & relevant teaching, research development, consultancy and community service as well as promote entrepreneurship in biotechnology and Bioinformatics. The CEBIB training program collaborates with other partners such as academic and research institutions, regional and international organizations to deliver on its objectives. CEBIB offers Master of Science (MSc) degrees in Biotechnology and Bioinformatics, as well as research opportunities for students pursuing PhD studies in both fields. In addition, relevant short courses are conducted to strengthen the regular programs.

1.5.1.3 Postgraduate Training Programs

The CEBIB postgraduate training program shall offer the following degree programs:

- Master of Science (MSc) in Bioinformatics (2 years)
- Master of Science (MSc) in Biotechnology (2 years)
- Doctor of Philosophy (PhD) in Bioinformatics (3 years)
- Doctor of Philosophy (PhD) in Biotechnology (3 years)

Some of the major themes and respective application areas under these course programs are:

Agricultural and Environmental Biotechnology

- Plant and Crop Biotechnology
- Molecular Taxonomy and Phylogenetics
- Food and Feed Safety
- Plant and Animal Breeding
- Molecular phenotyping and model systems
- Biopolicy, Biosafety and Intellectual Property

Health and Environmental Biotechnology:

- Pharmacology Drug Delivery and Pharmacogenomics
- Diagnostics and Vaccinology
- Forensic Sciences
- Immunotechnology and Molecular Diagnostics
- Molecular Epidemiology and Dynamics of Diseases
- Emerging infections and poverty related diseases

Industrial and Environmental Biotechnology:

- Environmental Microbial Bioremediation
- Food and Fermentation Technologies