



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF PUBLIC HEALTH BIOMEDICAL SCIENCES AND TECHNOLOGY (SPHBST)

COURSE OUTLINE

Department: Medical Laboratory Science
 Programme: Bachelor of Science in Medical Biotechnology

Course code: BMB 111

Course Title: Foundations of Medical Biotechnology

Year of Study: Year 1 Semester 1

Academic Year 2019/2020

Date: September –December 2019

1. Introduction

This course is designed to introduce the learner to the scope and the potential of Medical Biotechnology.

2. Course Purpose

This course is designed to enable the learner to study and apply biotechnological methods in Medicine and Laboratory Diagnosis. It will enable the learner to acquire the necessary skills, knowledge and attitudes to conduct general procedures done in Medical Biotechnology.

3. Learning outcomes

By the end of the course the learner will be able to:

- i. Explain the potential of Medical Biotechnology in Biomedical research
- ii. Illustrate aspects of Molecular Biology and Genetics application in Medical Biotechnology.
- iii. Explain the role of medical microbiology in Medical Biotechnology.
- iv. Explain the future of Medical Biotechnology in scientific world.

4. Rationale

There is a rapid technological advancement in Medical Biotechnology that would make diagnosis of diseases in Medical Laboratory easier. It is therefore vital to understand their application to enable complementarity with the routine diagnostic techniques, creating a whole round Medical Biotechnologist.

5. TEACHING-LEARNING STRATEGIES

Overview Lectures
 Group work and presentations
 Laboratory practicals
 Small-group Tutorial Discussions
 Individual reading assignments
 Self-directed Learning
 Field trips

6. Topic Outline

Week	Topic	Activities
1	Definition, emergence of Medical Biotechnology and scope.	Lectures, Group work
2	An interdisciplinary pursuit, historical perspective, and applications; mathematics and basic physical and life sciences and their relevance to biomedicine	Lectures, discussions
3	Advanced technology: history and application of genetic engineering, recombinant DNA technology,;	Lectures, discussions
4	Fermentation technology, cloning, transgenic animals and plants, monoclonal antibodies, environmental technology; engineering, computer science and their application in biomedical technology	Lectures, discussions
	Practical: DNA extraction, amplification and gel electrophoresis	Practicals
5	CAT ONE	CAT
6	Human Ecology, Nutrition and their relevance to Medical Biotechnology.	Group work, lectures,

		discussion.
7	Behavioural Sciences and its relevance to Medical Biotechnology.	Lectures, discussions
8	Application of enzymes in genetic and protein engineering ; Introduction to role of enzymes in industrial product synthesis;	Lectures, discussions
9	CAT TWO	CAT
10	Importance of blood parameters and serological tests, blood and cell transfusion practices.	Lectures, discussions
11	Principles of medical microbiology with special reference to common bacterial and viral diseases; principles of chemical analysis of blood and body fluids;	Lectures, discussions
	Practical: Bacterial Cell Culture	Practicals
12	Aspects of Pharmaceuticals and bio-pharmaceuticals , antibiotics, vaccines etc; Introduction to gene therapy and AIDS ; future prospects of biomedicine, medical biotechnology and ethical and moral issues in biomedicine.	Lectures, discussions
13	Revision	
14	CAT THREE	CAT
15	End of Semester Examinations	Exams
16	End of Semester Examinations	Exams

7. Course Requirements

a) Attendance

Attendance of lectures and other scheduled classes/practical/laboratory sessions is mandatory for all students. Any absence will prohibit the student from taking CAT and examinations.

b) Methods of Assessment (For university wide courses; CATs 40%, Exam 60%)

8. Continuous Assessment Tests (CATs):

Written CAT (At least 3 CATs, one of which has to be a sit-in)	20%
Practical CAT (Can be sit-in or practical marked reports)	20%
Final Examination (Written)	60%
Pass Mark	50%

9. Instructional Resources

- Lisa A. Seidman and Cynthia J. Moore (1999) Basic Laboratory Methods for Biotechnology. Prentice Hall. ISBN 0-13-795535-9.
- Susan Barnum (2004) Biotechnology: A Brief Introduction. Wadsworth Publishing. (2nd Edition) ISBN 0-534-49296-7.
- Judith Pongrac Habil and Mary Keen (2009). Medical Biotechnology, 1e. CHURCHILL LIVINGSTONE ELSEVIER. ISBN 978-0-08-045135-0.

10. Signing and Approval

Prepared by Course Lecturer:

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Issued by Curriculum Coordinator:

Name: Dr. Omedo A. Robin Sign.....Date.....

Approved by COD:

Name: George Soway Sign.....Date.....