



## **Course Outline Form**

## **EVEN SEMESTER 2019**

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*Dear Student: Course outlines are intended to provide students with an overall plan for a course to enable them to function efficiently and effectively in the course.*

*Academic Programs  
BSc Biotechnology  
EMEA College  
Kondotty*

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## Course Outline : BTY4BO5 GENETICS (2018-2019)

Name of the Stream	Science
Name of the Programme	BSc Biotechnology
Name of the Course	BTY4BO5 GENETICS
Nature of the Course	Core Course
Semester	Fourth
Lecturer(s)	Ruba Badrudheen
Name of the Coordinator	
Year	2018-2019
No of Credits	3
No of Contact Hours	3
Course Description	Course presents the fundamentals of human genetics. Includes physical basis of inheritance, the mechanics of inheritance, probability, sex chromosomal abnormalities, autosomal anomalies, gene structure and function, molecular genetics, behavioral genetics, twinning and contemporary issues in human genetics.
Course Objectives	Students will understand and practice the ethics surrounding scientific research. students will gain proficiency in basic laboratory techniques in genetics, and be able to apply the scientific method to the processes of experimentation and hypothesis testing.
Course Outcome	students will be able to: Synthesize and incorporate the fundamentals of gene technology in order to understand how such technology impacts humans. Employ the scientific method to generate new knowledge, and to solve problems, regarding human heredity. Apply to real life situations and one's life the principles of human heredity. Access historical and current knowledge regarding human heredity, and understand how such knowledge has influenced law, medicine and society.
Assessment Method	Assignments Class Tests Unit Tests Practical Tests Term Exam Seminars
Teaching Methods Used	
Textbook	Robert J Brooker, 2012, Concepts of Genetics, McGraw-Hill Benjamin A. Pierce, 2012, Genetics, A Conceptual Approach, W. H. Freeman and Company. Principles of genetics: Snustad, Simmons, Jenkins.
References	1. Robert J Brooker, 2012, Concepts of Genetics, McGraw-Hill 2. Benjamin A. Pierce, 2012, Genetics, A Conceptual Approach, W. H. Freeman and Company. 3. Principles of genetics: Snustad, Simmons, Jenkins. 4. Robert H. Tamarin, Principles of Genetics, Seventh Edition, The McGraw-Hill Companies

Internet Resources

### Internal Exam Pattern

Items	Marks/20	Marks/15
Assignment	4	3
Test Paper(s)/Viva voce	8	6
Seminar/Presentation	4	3
Class Room Participation based on Attendance	4	3
<b>Total</b>	<b>20</b>	<b>15</b>

### External Exam Pattern

Question Type	No of Question	Marks/Question	Total Marks
Short Questions(2-3 Sentences)	15	2	Ceiling 25
Paragraph / Problem Type	8	5	Ceiling 35
Essay Type	2 out of 4	10	20
<b>Total</b>			<b>80</b>
<b>Time</b>			<b>2.5 hrs</b>

Graduate Attributes

**Name of the Course:** BTY4BO5 GENETICS

#### **Knowledge**

#### **Academic and Intellectual Skills**

Self Learning

Collaborative Learning

#### **Professional Skills**

Communication Skills

Decision Making

Problem Solving Skills

Research Skills

Entrepreneur Aptitude

#### **Personal Skills**

Creative Thinking

Lifelong Learning

Application Skills

#### **Attitude and Values**

Social Responsibility

Ethical Commitment

Global Citizen

## Course Schedule

Introduction to Genetics: History of genetics,	Week 1
Mendelian genetics and applications- Monohybrid and dihybrid cross, Principle of segregation, Dominance, Independent Assortment	Week 2
Gene Interactions, Penetrance,	Week 3
Multiple Alleles. Assignment	Week 4
Non-Mendelian Inheritance- Extranuclear Inheritance, Maternal Effect,	Week 5
Epigenetic Inheritance,	Week 6
Linkage, Crossing Over;	Week 7
Gene mapping. Pedigree Analysis Unit test 1	Week 8
. Chromosome: Morphology, Structure and Organization of Chromosome,	Week 9
Eu- and heterochromatin,	Week 10
Special chromosomes, Karyotype,	Week 11
Sex Determination, Sex-Linked Characteristics. Variation in Chromosome number and Structure. first internal exam	Week 12
Human Genome, Human Inherited disorders. Genetic counseling. Eugenics and Euphenics.	Week 13
. Bacterial genetic system: Viral genome, Bacterial Chromosomes, Plasmids, Transformation, Conjugation, Transduction, Natural Gene Transfer,	Week 14
Isolation of auxotrophs, Replica plating techniques, Analysis of mutations in biochemical pathways.	Week 15
Quantitative Genetics- Quantitative Traits, Polygenic Inheritance, Types of Heritability. Population Genetics- Genotypic and Allelic Frequencies, Hardy-Weinberg Equilibrium, Factors affecting Genetic equilibrium .second internal exam	Week 16
Genetic Drift. Evolutionary Genetics - Modes of Speciation, Phylogenetic Trees,	Week 17
Molecular Evolution, Molecular Clock. Assignment Model exam	

## Contact Details

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