



Course Outline Form

EVEN SEMESTER 2019

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 Biochemistry
EMEA College
Kondotty*

Course Outline : BCH6B13 Classical Genetics and Molecular Biology (2019-2020)

Name of the Stream	Science
Name of the Programme	BSc Biochemistry
Name of the Course	BCH6B13 Classical Genetics and Molecular Biology
Nature of the Course	Common Course
Semester	Sixth
Lecturer(s)	N K Zaheera Banu
Name of the Coordinator	
Year	2019-2020
No of Credits	4
No of Contact Hours	6
Course Description	An introduction to the principles of genetics, including topics from classical Mendelian concepts to the contemporary molecular biology of the gene
Course Objectives	<ol style="list-style-type: none"> 1. To provide basic knowledge on classical genetics 2. To create detail knowledge on molecular biology
Course Outcome	<p>After completion of the course, an understanding of the central theories and methodologies that define the field of genetics and its various subdisciplines (traditional, molecular, and population genetics) and the ability to use the vocabulary that embodies this knowledge is acquired</p>
Assessment Method	<p>Assignments</p> <p>Homeworks</p> <p>Class Tests</p> <p>Unit Tests</p> <p>Term Exam</p> <p>Seminars</p> <p>Lab Experiments</p>
Teaching Methods Used	
Textbook	
References	<ol style="list-style-type: none"> 1. Genes : Benjamin Lewin, Pearson education Inc. upper Siddle River NJ. ISBN 0-13- 123826-4 2. Molecular Biology of gene: Watson Hopkins, Benjamin Cummings 3. Cell and Molecular biology: Gerald Karp, John Wiley & Son Inc. New York ISBN 0-471-38913-7 4. Lehninger's principles of Biochemistry -: D. L. Nelson and M. M. Cox , Worth Publishers, 41 Madisons Avenue New York, USA ISBN 0-333-94657-X
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
Total	20	15

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
Total			80
Time			2.5 hrs

Name of the Course: BCH6B13 Classical Genetics and Molecular Biology

Knowledge

Academic and Intellectual Skills

Self Learning

Collaborative Learning

Professional Skills

Graduate Attributes

Problem Solving Skills

Research Skills

Personal Skills

Lifelong Learning

Attitude and Values

Social Responsibility

Global Citizen

Course Schedule

Unit I.	Week 1
Mendel's laws of inheritance, gene interaction, Dominance relationship-complete, incomplete and co-dominance, multiple alleles, linkage. Chromosomal aberrations: Monosomy, trisomy.	Week 2
Translocations, inversions, duplications, deletions.	Week 3
Unit II.	Week 4
Preliminary study of gene mapping in haploid and diploids, recombination mapping, complementation analysis, physical mapping and restriction mapping, gene transfer in bacterial conjugation, transformation and transduction. Sex determination in Drosophila and humans, pedigree analysis.	Week 5
	Week 6

Unit III		Week 7
History- DNA as a genetic material Chemical nature of gene, central dogma of molecular biology, Genome organization chromatin organization centromere telomere exons and introns C- value paradox, Prokaryotic transposable elements- IS elements, Composite transposons, Tn-3 elements		Week 8
Modes of transposition		Week 9
Unit IV		Week 10
DNA replication in prokaryotes. Chemistry of DNA synthesis, general principles - bidirectional replication, rolling circle model, Semiconservative, RNA priming Enzymes involved in DNA replication – DNA polymerases, DNA ligase, Primase, and other accessory proteins. Mutation and its types. Mutagens- Physical and chemical. Ames test DNA damage and repair (Direct repair DNA photolyases -Mismatch repair,-base excision repair- nucleotide excision repair).		Week 11
		Week 12
Unit V		Week 13
Transcription in prokaryotes (- promoter sequences- sigma factor-RNA polymerase initiationelongation and termination) inhibitors of transcription -brief mention about post transcriptional processing.		Week 14
Unit VI		Week 15
Genetic code and wobble hypothesis. Translation in prokaryotes, Assembly line of polypeptide synthesis - ribosome structure and assembly, various steps in protein synthesis. Charging of tRNA, aminoacyl tRNA synthetases. Proteins involved in initiation, elongation and termination of polypeptides. Inhibitors of protein synthesis. Brief mention about the opost translational modifications		Week 16
		Week 17
Unit VII.		Week 18
Regulation of gene expression in prokaryotes. Operon concept, Lac operon, tryptophan operon.		

Contact Details

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