Course Outline Form

ODD 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 Biotechnology
EMEA College
Kondotty

Course Outline : BTY5BO7. MOLECULAR BIOLOGY (2018-2019)

Name of the Stream	Science
Name of the Programme	BSc Biotechnology
Name of the Course	BTY5BO7. MOLECULAR BIOLOGY
Nature of the Course	Core Course
Semester	Fifth
Lecturer(s)	Dr K.Mashhoor And Ruba Badrudheen
Name of the Coordinator	Dr K.Mashhoor
Year	2018-2019
No of Credits	4
No of Contact Hours	3
Course Description	Molecular biology covers a detailed analysis of the biochemical mechanisms that control the maintenance, expression, and evolution of prokaryotic and eukaryotic genomes. The topics covered in lectures and readings of relevant literature include gene regulation, DNA replication, genetic recombination, and mRNA translation.
Course Objectives	To Identify and explain the mechanisms leading from DNA to proteins. Objective To Identify and illustrate the components of subcellular infrastructure of a eukaryotic or a prokaryotic cell. To describe a way in which cell communication drives development, behavior, or physiology.To describe the functions of individual cells in a given tissue of a multicellular organism.
Course Outcome	Molecular biology is the basic science that has as its goal an explanation of life processes at the subcellular and molecular level. Recent years have seen explosive advances in the study of DNA and molecular genetics, including gene cloning, sequencing and mapping. Developments in molecular biology have opened new areas of study and provided powerful techniques that are revolutionizing the pharmaceutical, health, and agricultural industries. They have spawned new industries in biotechnology, and opened avenues for answering basic and applied questions in all of the life sciences. Molecular biology students complete a comprehensive curriculum in the fundamentals of science and are prepared to address problems in the biochemical, biological and agricultural sciences. The requirements of the molecular biology major assure competence in the broad scientific theory and application of molecular biology, while allowing flexibility for students to develop strength in their biochemical, biological or agricultural discipline.

Assessment Method	Assignments Class Tests Unit Tests Practical Tests Term Exam Seminars Lab Experiments
Teaching Methods Used	
Textbook	Karp G 2010, Cell and Molecular Biology Concepts and Experiments, John Wiley & Sons, Inc. Watson JD 2007, Molecular Biology of the Gene, Pearson Benjamin Cummings Alberts B 2008, Molecular Biology of the Cell, Garland Science Cooper GM 2009, The Cell A Molecular Approach, ASM Press
References	1. Karp G 2010, Cell and Molecular Biology Concepts and Experiments, John Wiley & Sons, Inc. 2. Watson JD 2007, Molecular Biology of the Gene, Pearson Benjamin Cummings 3. Alberts B 2008, Molecular Biology of the Cell, Garland Science 4. Cooper GM 2009, The Cell A Molecular Approach, ASM Press 5. Weaver RF 2012, Molecular Biology, McGraw-Hill 6. Bolsover SR 2004, Cell biology: a short course, John Wiley & Sons, Inc.
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**

Graduate Attributes	**Name of the Course:** BTY5BO7. MOLECULAR BIOLOGY **Knowledge** **Academic and Intellectual Skills** Self Learning Collaborative Learning **Professional Skills** Communication Skills Team Work and Leadership Decision Making Problem Solving Skills Research Skills **Personal Skills** Application Skills **Attitude and Values** Ethical Commitment Global Citizen

Course Schedule

Genetic material: Discovery of DNA as genetic material,	Week 1
structure and functions of DNA and RNA. DNA topology, nucleosome	Week 2
Regulatstructural organization of chromosomes.ion of chromatin structure. Histones and Non Histones. Morphology, types of chromosome	Week 3
Genome: Structure,composition and Complexity of prokaryotic and eukaryoticgenome	Week 4
Intergenic sequences, pseudogenes,Repeated DNA Sequences	Week 5
Central dogma. Teminism	Week 6
DNA Replication.Chemistry, enzymes involved and salient features of prokaryotic and eukaryotic DNA replication. History of DNA Replication	Week 7
Types of mutation	Week 8
DNA Repair- excision repair, mismatchrepair and double-strand breakage repair.	Week 9
DNA recombination- homologous and site-specific.	Week 10

Mechanism and type of transposition in prokaryotes and eukaryotes.	Week 11
Gene Expression: Details of initiation, elongation and termination of transcription	Week 12
Translation in prokaryotes and eukaryotes	Week 13
Post transcriptional modification of mRNA, rRNAand tRNA, chemistry and pathway of splicing, alternative splicing, properties of the geneticcode	Week 14
Post translational modification of protein. Inteins and Exteins	Week 15
Regulation of genexpression: Gene structure in prokaryotes and eukaryotes, lac, trp and ara operon,	Week 16
Transcriptional, processing and translational level control of eukaryotic gene expression	Week 17
. Enhancers and Silencers. Chaperones and proteasomes.	Week 18

Contact Details

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