



BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
INSTRUCTION DIVISION
SECOND SEMESTER 2015-2016
Course Handout (Part - II)

Course No. : PHA F215
Course Title : Introduction to Molecular Biology
Instructor-in-Charge : Dr. Aniruddha Roy
Instructors : Dr. Aniruddha Roy

1. Scope and Objective of the Course:

This course deals with Basic aspects of cell and molecular biology, DNA replication, transcription, translation and control mechanisms of protein synthesis. Post transcriptional modifications, DNA-protein interactions and regulation of gene expression. Basic aspects of immune system, cell-mediated and humoral immunity.

2. Text Book :

1. G.M. Cooper and R.E. Hausman, The Cell: A Molecular approach, ASM Press, Washington, D.C.4th Edition. 2007.
2. Kuby Immunology by Owen et al., 7th Ed. Freeman press. 2013.

3. Reference Books :

1. B. Albert et al., Molecular Biology of the cell, 5th edition, Taylor & Francis Group, 2008.
2. H. Lodish et al., Molecular Cell Biology, 7th Ed., MacMillan, 2013.
3. Janeway's Immunobiology, Eighth Edition.

4. Course Plan

Lec. No.	Learning Objectives	Topic to be Covered	Ref.
1-6	Introduction to molecular biology	Molecular biology of a cell and its applications. Brief outline of molecular chemistry	TB1, Ch1,2
7-9	Cells	Cellular activities, check points, programmed cell death, cell-cell interactions, molecular basis for human diseases	TB1, Ch3, 11, 12, 14
10-11	Genome	Structures of RNA, DNA	TB1 Ch4, 5
12-14	DNA replication	DNA replication, repair and recombination, genetic disorders and cancer	TB1 Ch6
15-19	Cell cycle	Regulation of cell cycle, proliferation, events of miosis, cytokines, etc,	TB1 Ch16
20-22	RNA and Protein	RNA and protein synthesis, RNA polymerases, transcription, regulation of protein function	TB1 Ch7, 8
23-24	Plasma membrane	Structure of plasma membrane, transport of small molecules, receptors	TB1 Ch13
25-26	Cell signaling	Signaling molecules, receptors and transporters, cell surface proteins, signal transduction and cytoskeleton, protein kinases, signal transduction and oncogenes	TB1 Ch15
27-28	Immune system	Cells, organs and tissues of immunity, receptors and signaling, antigen, antibody,	TB2, Ch1-3





		immunoglobulin genes	
29-33	Innate immunity, MHC and antigen presentation	Infection barriers, phagocytosis, inflammation and adaptive immune responses, Role of MHC and expression patterns, antigen processing and presentation	TB2, Ch5, 8
34-37	Cell-based Immunity	T-cell and B-cell activation, differentiation, memory, effector responses	TB2, Ch11-13
38-40	Immune disorders	Immunodeficiency diseases, autoimmune diseases, allergy and hypersensitivity reactions, etc.	TB2, Ch15-16

5. Evaluation:

Component	Duration	Weightage (%)	Date & Time	Remarks
Mid term	90 mts.	35	18/3 2:00 -3:30 PM	CB
*Continuous Assessment		20		
Compre Exam	3 hrs.	45	13/5 FN	OB + CB

*Continuous assessment will be based on theory covered in class. Topics and number will be announced in the class. It will be in terms of home assignments, tutorials, projects, laboratory, viva- voce and presentation/ seminars.

6. Chamber consultation hours: To be announced in class.

7. Notices: Notices concerning the course will be displayed on the Pharmacy Notice Board.

8. Make-Ups: Make-Ups are not given as a routine. It is solely dependent upon the GENUINENESS OF THE CIRCUMSTANCES under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge.

Instructor-in -Charge

PHA F215

