BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
INSTRUCTION DIVISION
FIRST SEMESTER 2016-2017
Course Handout (Part - II)

01-08-2016

Course No. : **PHA F215**
Course Title : **Introduction to Molecular Biology**
Instructor-in-Charge : **Arti Dhar**
Instructors : **Arti Dhar**

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. L. Picorina, Molecular Biology of Cancer: Mechanisms, Targets and Therapeutics, 3rd Ed., Oxford University Press, 2012

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, 7
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 meiosis, 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	TB1 Ch15

		transporters, cell surface proteins, signal transduction and cytoskeleton, protein kinases, signal transduction and oncogenes	
27-28	Immune system	Cells, organs and tissues of immunity, receptors and signaling, antigen, antibody, immunoglobulin genes	TB2, Ch1-3
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
Test I	50 mts.	15	13/9, 4.00--5.00 PM	CB
Test II	50 mts.	15	21/10, 4.00--5.00 PM	CB
Surprise quiz		15		
Seminars, presentations and Assignments		20		OB
Compre Exam	3 hrs.	35	13/12 FN	CB(25)+OB(10)

6. **Chamber consultation hours**: To be announced in class.
7. **Notices**: Notices concerning the course will be displayed on the pharmacy group notice board only.

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**

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