FIRST SEMESTER 2019 - 2020

Course Handout (Part-II)

01.08.19

In addition to part I (General Handout for all courses appended to the Time Table) this portion gives further specific details regarding the course.

Course No. : **BIO F213**
Course Title : **CELL BIOLOGY**
Instructor-in-Charge : **JAYATI RAY DUTTA**
Instructors : **JAYATI RAY DUTTA**

1. **Course Description:** The course deals with fundamental processes of life at cellular and sub-cellular levels, cell environments, membrane transport, cell movements, division and control mechanisms.

2. **Scope and Objective of the Course:**

The field of cell biology is both dynamic and evolving constantly. It is an academic discipline that studies cells at microscopic and molecular levels – their physiological properties, their structure, the organelles they contain, interactions with their environment and their life cycle. Today the basic knowledge of '*the cell*' is must for biology students. This course imparts the vast knowledge of the cell and cellular processes to prepare students to pursue their enquiry into the fundamentals of life.

3. **Text Books (TB):** *Cell and Molecular Biology* by De Robertis & De Robertis, Lippincott Williams and Wilkins, (8th Ed), 5th Indian reprint, 2017.

4. **Reference Books (RB):**

RB1: *The World of Cell* by W.M Becker, L.J. Kleinsmith and J. Hardin. Pearson Education (6th Ed), 2007.

RB2: *Molecular Biology of the Cell* by Bruce Albert et al., Garland Science (5th Ed), 2008.

RB3: *Cell and Molecular Biology* by P. Sheeler and D. Bianchi, John Wiley & Sons, Inc. (3rd Ed), 2009.

5. **Course Plan:**

Lecture No.	Learning Objectives	Topics to be covered	Chapter in the Text Book
1- 4	Preview of Cell	Brief introduction, Cell structure and overview of cell organelles, The composite Animal, Plant, Bacterial, Mycoplasma cells Viruses and Microscopy	Ch.1 & Ch. 3 (TB) Ch. 1 (RB3)
5-9	Cell Membrane – organization, constituents, cell junctions	Structure and chemical organization of plasma membrane. Lipids, Carbohydrates and Proteins in the membrane. Origin of plasma membrane and its protein and lipid asymmetry, Cell-cell junctions and other specialized structures	Ch. 4 & Ch. 5 (TB) Ch. 15 (RB3)
10-12	Transport across cell	Passive movement through cell membrane,	Ch. 4 (TB)

	membrane	Facilitated diffusion, Active transport, Bulk transport, Endo- and Exocytosis	Ch. 15 (RB3)
13-16	Major Cell Organelles – Mitochondria, Chloroplast	Energy transducing organelles: Structure and functions of Mitochondria and Chloroplast	Ch. 11 & 12 (TB) Ch. 16 & 17 (RB3)
17-18	Structural & functional aspects of Lysozymes & Microbodies	Lysosomes and Microbodies	Ch.10 (TB) Ch. 19 (RB3)
19-21	Structure & function of Endoplasmic reticulum & Golgi	Endoplasmic reticulum: Structure, functions and association with Golgi apparatus	Ch. 8 & 9 (TB) Ch. 12 (RB1)
22-24	Structural & functional aspects of Golgi	Golgi apparatus: origin, development, structure and functions	Ch. 9 (TB)
25-27	Structure & function of ribosomes	Ribosomes: Composition, structure and functions. Eukaryotic and Prokaryotic ribosomes.	Ch. 21 (TB)
28-29	Structural & functional aspects of nucleus & cell division	Nucleus: Organization and Division	Ch. 13, 15 & 16 (TB) Ch. 20 (RB3)
30-31	Microtrabecular lattice & its constitution	Microtrabecular lattice, cytoplasmic filaments, microtubules, spindle fibers and centrioles	Ch. 6 (TB) Ch. 23 (RB3)
32-34	Cell Growth	Growth curve. Quantitation of cells. Continuous culture of cells. Synchronous cell cultures	Ch. 2 (RB3)
35-36	Cell cycle & its regulatory mechanism	Regulation of Cell cycle	Ch. 19 (RB1)
37-39	Cancer & Apoptosis	Cancer and Programmed cell death/Apoptosis	Ch. 24 (RB1)
40-42	Cell Communication	General principle. Signaling molecules. Receptor-mediated signaling	Ch. 15 (RB2)

6. Evaluation Scheme:

Components	Duration	Weightage (%)	Date Time	Nature of the Component
Mid-semester exam	1.5 hrs	30	01.10.19 9.00 -- 10.30 AM	**CB**
Continuous evaluation – multiple quizzes, assignments		30	TBA	**OB**
Comprehensive exam	3 hrs	40	06.12.19 (FN)	**CB**

7. Chamber Consultation Hour: To be announced in the class.

8. Notices: Notices concerning the course will be displayed on the Notice Board at **Biological Sciences Group.**

9. Make-up policy: As per the **clause 4.07 in the Academic regulations booklet.**

10. Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

INSTRUCTOR-IN-CHARGE
BIO F213