

Subject Code: 02MB0154

Subject Name: Cell Biology

B. Sc. Semester - II

Objective: To provide fundamental insight of cellular architecture and functional aspects of cellular organelles.

Credits Earned: 4 Credits

Course Outcomes: After completion of this course, student will be able to

- > Distinguish between Prokaryotic and Eukaryotic organization.
- Distinguish between Plant and Animal cells.
- Understand the structures and functions of various cellular organelles and its importance.
- > Explain the cell division and cell cycle regulation.

Pre-requisite of course: Fundamental knowledge of prokaryotic and eukaryotic cells.

Teaching Scheme (Hours)				Theory Marks			Tutorial/ Practical Marks		Tatal
Theory	Tutorial	Practical	Credits	ESE (E)	Mid Sem (M)	Internal (I)	Viva (V)	Practical	Marks
4	0	0	4	50	30	20	0	0	100

Teaching and Examination Scheme



Contents:

Unit	Topics	Contact Hours			
1	Fundamentals of Cell Structure. Structural organization of cell: difference between plant and animal cell:				
	prokaryote and eukaryote cell; specialized plant cell types. Cell wall: Basic				
	architecture of cell wall and biogenesis. Plasma membrane: Structure, models, functions; ion carriers, channels and pumps.				
2	Ultrastructure of Cell Organelles and function.	20			
	Chloroplast: Structure; biogenesis; genome organization and				
	nucleochloroplastic interactions. Mitochondria: Structure; genome				
	organization and biogenesis. Structure and Functions of Intracellular				
	Junctions in plants and animals. Vacuoles in plant and animal: vacuoles as				
	multifunctional compartments; vacuoles as storage organelle.				
	Ribosomes: Structure; functions. Nucleus: Structure; nuclear pore complex;				
	apparatus: lysosomes: endoplasmic reticulum: microbodies				
3	Cytoskeleton and Protein sorting	15			
	The cytoskeleton: organization of microtubules, microfilaments and				
	intermediate filaments, cytoskeletal accessory proteins. Basics of Protein				
	sorting and Targeting: Targeting of proteins into different organelles,				
	bacterial protein sorting				
4	Cell Division	10			
	Mitosis and Meiosis, Introduction to cell cycle, Regulation of cell cycle; role				
	of cyclins and cyclin dependent proteins				
	Total Hours	60			

References:

- 1. Cell Biology, Genetic, Molecular biology, Evolution and Ecology by P.S.Verma, 14th Edition by S. Chand and company
- 2. Becker's World of the cell by : Gregory Paul Berto, 8th edition, Publisher: Benjamin Cummings
- 3. Molecular Biology of the Cell by Bruce Albert, 5th Edition, Publisher: Garland Science
- 4. Basic cell biology, Abhilash Jain, Cumpus Books International
- 5. Cell Biology, T Devasena, Oxford University Press.
- 6. The Cell: A molecular approach, Cooper, G. M. and Hausman, R. E. Sinauer Associates.
- 7. Cossart et al., 2000 Cellular Microbiology
- 8. Phillip Sheeler and Donald E.Blanch Cell & Molecular Biology 3rd ED John Willey Pub.
- 9. De Roberts and De Roberts, 1998 Cell and Molecular Biology. Wavely Pvt. Ltd.



Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation								
Remember	Understand	Apply	Analyze	Evaluate	Create			
20%	20%	30%	15%	15%	0%			

Instructional Method:

- a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by white board may also use any of tools such as demonstration, role play, Quiz, brainstorming, etc.
- b. The internal evaluation will be done based on continuous evaluation of students in the classroom in the form of attendance, assignments, presentations, verbal interactions etc.
- c. Students will use supplementary resources such as online videos, ebooks, ppts etc.