INSTITUTE	**FACULTY OF SCIENCE**
PROGRAM	**BACHELOR OF SCIENCE (CHEMISTRY)**
SEMESTER	**2**
COURSE TITLE	**CELL BIOLOGY**
COURSE CODE	**02MB0154**
COURSE CREDITS	**4**

Objective:

1 To provide fundamental insight of cellular architecture and functional aspects of cellular organelles

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

1 Distinguish between Prokaryotic and Eukaryotic organization
2 Distinguish between Plant and Animal cells
3 Understand the structures and functions of various cellular organelles and its importance
4 Explain the cell division and cell cycle regulation

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

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	50	30	20	0	0

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.	15
2	**Ultrastructure of Cell Organelles and function** 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; nucleolus. Other cellular organelles: Structure and functions of Golgi apparatus: lysosomes; endoplasmic reticulum; microbodies.	20

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Contents : Unit	Topics	Contact Hours
3	**Cytoskeleton and Protein sorting** 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	15
4	**Cell Division** Mitosis and Meiosis, Introduction to cell cycle, Regulation of cell cycle; role of cyclins and cyclin dependent proteins	10
Total Hours		**60**

Textbook :

1 Cell Biology, Genetic, Molecular biology, Evolution and Ecology, P.S.Verma, S. Chand and company, 2022

2 Basic cell biology, Abhilash Jain, Campus Books International, 2012

References:

1 Cell and Molecular Biology. , Cell and Molecular Biology. , De Roberts and De Roberts, John Willey Pub., 1998

2 The Cell: A molecular approach, The Cell: A molecular approach, Cooper, G. M. and Hausman, R. E. , Sinauer Associates, 2000

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as 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 / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
20.00	20.00	30.00	15.00	15.00	0.00

Instructional Method:

1 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.

2 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.

3 Students will use supplementary resources such as online videos, ebooks, ppts etc.

Supplementary Resources:

1 https://www.ncbi.nlm.nih.gov/books/NBK9839/

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Supplementary Resources:

2 https://www.ncbi.nlm.nih.gov/books/NBK21054/

3 https://www.ncbi.nlm.nih.gov/books/NBK217813/

4 https://www.ncbi.nlm.nih.gov/books/NBK588363/

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