INSTITUTE	**FACULTY OF PHARMACY**
PROGRAM	**BACHELOR OF PHARMACY**
SEMESTER	**8**
COURSE TITLE	**CELL AND MOLECULAR BIOLOGY**
COURSE CODE	**13PH0808**
COURSE CREDITS	**4**

Objective:

1 Cell biology is a branch of biology that studies cell-their physiological properties, their structure, the organelles they contain, interactions with their environment, their life cycle, division, death and cell function. This is done both on a microscopic and molecular level. Cell biology research encompasses both the great diversity of single-celled organisms like bacteria and protozoa, as well as the many specialized cells in multi-cellular organisms such as humans, plants, and sponges.

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

1 Summarize cell and molecular biology history.
2 Summarize cellular functioning and composition.
3 Describe the chemical foundations of cell biology.
4 Summarize the DNA properties of cell biology.
5 Describe protein structure and function.
6 Describe basic molecular genetic mechanisms. Summarize the cell cycle.

Pre-requisite of course: Cell biology is a branch of biology that studies cell-their physiological properties, their structure, the organelles they contain, interactions with their environment, their life cycle, division, death and cell function. This is done both on a microscopic and molecular level. Cell biology research encompasses both the great diversity of single-celled organisms like bacteria and protozoa, as well as the many specialized cells in multi-cellular organisms such as humans, plants, and sponges.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	1	0	75	15	10	0	0

Contents : Unit	Topics	Contact Hours
1	**Cell and molecular biology** a) Cell and molecular biology: Definitions theory and basics and Applications. b) Cell and Molecular Biology: History and Summation. c) Properties of cells and cell membrane. d) Prokaryotic versus Eukaryotic e) Cellular Reproduction f) Chemical Foundations – an Introduction and Reactions (Types).	10

DR. RAMESH BHANAJIBHAI PARMAR
Digitally signed by (Name of HOD)

DR. LALJI HAKUBHAI BALDANIYA
Digitally signed by (Name of Dean/ Principal)

Contents : Unit	Topics	Contact Hours
2	**DNA and the flow of molecular information** DNA and the flow of molecular information b) DNA Functioning c) DNA and RNA d) Types of RNA e) Transcription and Translation.	10
3	**Proteins** Proteins: Defined and Amino Acids b) Protein Structure 173 c) Regularities in Protein Pathways d) Cellular Processes e) Positive Control and significance of Protein Synthesis.	10
4	**Science of genetics** Science of genetics b) Transgenics and Genomic Analysis c) Cell Cycle analysis d) Mitosis and Meiosis e) Cellular Activities and Checkpoints.	8
5	**Cell signals** Cell signals: Introduction b) Receptors for Cell Signals c) Signaling Pathways: Overview d) Misregulation of Signaling Pathways e) Protein-Kinases: Functioning.	7
Total Hours		**45**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Turorials** Tutorial 1, Tutorial 2, Tutorial 3, Tutorial 4, Tutorial 5, Tutorial 6, Tutorial 7, Tutorial 8, Tutorial 9, Tutorial 10, Tutorial 11, Tutorial 12, Tutorial 13, Tutorial 14, Tutorial 15	15
Total Hours		**15**

Textbook :

1 W.B. Hugo and A.D. Russel: Pharmaceutical Microbiology,, Blackwell, Scientific publications, Oxford London., 1999

References:

1 Prescott and Dunn., Industrial Microbiology, 4th edition, CBS Publishers & Distributors, Delhi.

2 Pelczar, Chan Kreig, Microbiology, Tata McGraw Hill ed.

3 Malcolm Harris, Balliere Tindall and Cox: Pharmaceutical Microbiology.

4 Rose: Industrial Microbiology.

5 Frobisher, Hinsdill et al: Fundamentals of Microbiology, 9th ed. Japan

6 Cooper and Gunn's: Tutorial Pharmacy, CBS Publisher and Distribution.

7 Peppler: Microbial Technology.

8 Edward: Fundamentals of Microbiology.

9 N.K.Jain: Pharmaceutical Microbiology, Vallabh Prakashan, Delhi

10 Bergey's manual of systematic bacteriology, Williams and Wilkins- A Waverly company

References:

11 B. R. Glick and J. J. Pasternak: Molecular Biotechnology: Principles and Applications of RecombinantDNA: ASM Press Washington D.C.

12 RA Goldshy et. al., Kuby Immunology.

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					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	30.00	25.00	15.00	10.00	0.00

Instructional Method:

1 The course delivery method will depend upon the requirement of content and the need of students. The teacher in addition to the conventional teaching method by the blackboard may also use any tools such as demonstration, role play, quiz, brainstorming, MOOCs etc.

2 The internal evaluation will be done based on continuous evaluation of students in the laboratory and classroom.

3 Students will use supplementary resources such as online videos, NPTEL videos, MOOCs/ e-courses, virtual laboratories.

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