



**Gyanmanjari**  
Innovative University

Course Syllabus

Gyanmanjari science college

Semester-1(M.Sc.)

**Subject:** Cell Biology-MSCZO11503

**Type of course:** Major

**Prerequisite:** Understanding basic biological concept, including cell structure and function.

**Rationale:** To communicate new findings about structure and function, and dynamics of cells. Cell biology is a vast and complex field, and there is always more to learn about how cells work.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P		C	Theory Marks		Practical Marks		
					ESE	MSE	V	P	ALA
4	0	0	4	60	30	10	00	50	150

*Legends: CI-Classroom Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.*

**Continuous Assessment:**

Sr. No	Active Learning Activities	Marks
1	<b>Cell observation and model Creation</b> Each student creates a 3D model of an animal cell using construction paper or modeling clay. Then submit a photo to the GMIU web portal.	10
2	<b>Label the diagram</b> A diagram will be provided by the faculty will have to be labeled by the student and then submitted to the GMIU web portal.	10
3	<b>Chose the Organelle</b> If there is new research about that organelle according to the current situation, submit it to the GMI web portal.	10



4	<b>Review on cell signaling</b> The student has to give a review on the research paper on cell signaling and submit it on the GMIU web portal.	10
5	<b>Quiz</b> Faculty will conduct quiz session in classroom per unit of their respective subject.	10
Total		50

**Course Content:**

Unit No.	Course content	Hrs	% Weightage
1	<b>Chapter-1 Chapter: 1 Cell Theory</b> General Cellular Status of prokaryotic and eukaryotic cells. Cell wall and cell membrane and its function. Cell cycle: Cell division and its types (somatic and reduction division). Regulation and control of cell cycle. Apoptosis.	15	25
2	<b>Chapter-2 Cell Organelles</b> Ribosome- structure and functions, Endoplasmic reticulum – protein insertion, protein folding, Golgi complex-protein glycosylation and protein sorting, mechanism of vesicular transport, Mitochondria-structure and functions, Lysosomes, Peroxisomes, Glyoxysomes. Nucleus and Nuclear membrane.	15	25
3	<b>Chapter-3 Cell organization and Cell movement</b> Structure and organization of Microtubules, Intermediate filaments & Microfilaments, Molecular motors	15	25
4	<b>Chapter-4 Cell Signaling</b> Basic principles of cell communication. Extracellular messengers (signaling molecules), role of Calcium and Nitric oxide (NO) as intracellular and intercellular messengers. Receptors: G-Protein coupled receptors, Receptor tyrosine kinases (RTK), Ion channel receptors, Cytokine receptors (Tyrosine kinase linked receptors). Second messengers: Cyclic-AMP, Cyclic-GMP, Inositol-1,4,5- trisphosphate (IP3).	15	25

**Suggested Specification table with Marks (Theory):**

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	30	50	20	0	0	0

**Course Outcome:** Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

After learning the course the students should be able to:	
CO1	Gain Knowledge on Cellular analysis of prokaryotic and eukaryotic cells.
CO2	Learn about organelles present in plant, animal and microbial cells.
CO3	Pursue knowledge of Cell organization and Cell movement.
CO4	Summarize the mechanisms of cell - cell interaction and signal transduction.

**Instructional Method:**

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

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment



Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

### Reference Books:

1. Becker, W. M., Kleinsmith, L. J., & Hardin, J. (2007). The World of the Cell. Pearson, New Delhi.
2. Cooper, G. M., & Hausman, R. E. (2018). The cell: Molecular approach. (8th edn). Oxford University Press
3. Karp, G. (2015). Cell and molecular biology: concepts and experiments. (8th edn). John Wiley & Sons.
4. Krebs, J. E., Goldstein, E. S., & Kilpatrick, S. T. (2009). Lewin's genes X. Jones & Bartlett Publishers.
5. Palladino, M. A., Spencer, C. A., Cummings, M. R., & Klug, W. S. (2015). Concepts of Genetics. Pearson Higher Ed.: A
6. Pierce, B. A. (2012). Genetics conceptual approach. Macmillan.
7. Pollard, T. D. & Earnshaw, W.C. (2008). Cell Biology. Saunders Elsevier.
8. Snustad, D. P., & Simmons, M. J. (2015). Principles of genetics. John Wiley & Sons.

