ORIENTAL COLLEGE (AUTONOMOUS), TAKYEL, IMPHAL
TEACHING PLAN
(B.A/B.Sc.)
Name of Department: Zoology
Semester – 2nd Semester 2022- 23
Paper Name: Cell Biology Paper Code: Zoo HC 504

No. of Hours per Week	Credits	Total No. of Hours	Marks
4	4	60	75

Course Objectives:

- **Cell Biology deals with the detailed study of a cell including cell structure, cellcomposition, cell organelles and the interaction of cells with other cells and the larger environment in which they exist.**

Learning outcomes:

- **The students will understand the importance of cell as a structural and functional unit of life.**
- **The students understand and compare between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development.**
- **The dynamism of bio membranes indicates the dynamism of life. Its working mechanism and precision are responsible for our performance in life.**
- **The cellular mechanisms and its functioning depends on endo-membranes and structures. They are best studied with microscopy.**

Unit	Section	Topic Lecture	Hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I	**Overview of cells and plasma**					
	1	Prokaryotic and Eukaryotic cells	3	Learnt about the two basic type of cells	Lecture, PPT, Diagram	MCQ, Oral test, Assignment, Seminar presentation.
	2	Virus, Viroids, Mycoplasma, Prions	3	Studies the different agents which cause disease to living organisms		
	3	Various models of plasma membrane structure Transport across membranes structure	4	Explored the different models of plasma membrane		
	4	Transport across membrane- Active and Passive transport, Facilitated transport	4	Understand how molecules, ions and other substances are transported through the cell membranes		
	5	Cell junctions: Tight junctions, Desmosomes, Gap junctions	3	Learnt that the cells in multi-cellular organisms remain intact and co-ordinate due to the presence of various membrane proteins		
II	**Endo-membrane system**					
	1	Structure and function of Endoplasmic reticulum	3	Understand the structure of the membrane bound organelle and its role in intracellular transport,	Lecture, PPT	Objective Q, Very short Q, Short answer, Assignment, Seminar

				protein synthesis, lipid synthesis		
	2	Structure and function of Golgi Apparatus	2	Knowledge about the structure of Golgi body. The students understood that protein and lipids received from the ER are further processed and sorted for transport to different organelles like lysosome, plasma membrane etc.		
	3	Structure and function of Lysosomes	3	Learnt that this membrane bound organelle contain digestive enzymes and these enzymes are used to break down worn out cell parts and also used to destroy invading viruses and bacteria.	Lecture, PPT	
3	**Mitochondria and Peroxisomes**					
	1	Structure and function of mitochondria	3	Learnt that mitochondria is a double membrane structure and it's the site of aerobic respiration where chemical energy ATP is generated to be used by the living organisms	PPT, Lecture	MCQ, Short answer, Assignment, Quiz

	2	Semi-autonomous nature, Endo-symbiotic hypothesis, Chemi-osmotic hypothesis of mitochondria	6	Understand the semi autonomous nature of mitochondria. Discussed theories for the origin of mitochondria and generation ATP		
	3	Structure and function of Peroxisomes	3	Learnt the structure of peroxisomes and they are evolved energy metabolism and lipid biosysnthesis.		
4	**Cytoskeleton and Nucleus**					
	1	Structure and Functions: Microtubules, Microfilaments and Intermediate filaments	5	Studied the different types of cytoskeleton in Eukaryotes. Learnt that it connects the cell physically and biochemically to external environment and also arranged the content of the cell	Lecture, PPT, Picture	Objective Q, Short answer, Oral test.
		Structure Nucleus: Nuclear envelope, Nuclear pore complex, Nucleolus	5	Studied the ultra structure of nucleus and its constituents. Understand the composition of chromosome – chromatin; types of chromatin		
		Chromatin: Euchromatin and Heterochromatin and packaging	5	Understand the composition of chromosome – chromatin; types of chromatin		

		(nucleosome).				
5	**Cell division and cell signaling**					
		Meiosis, Cell cycle and its regulation	4	Recalled the basic types of cedll division. Learnt in detail about cell division and cell cycle	Diagram, PPT, Lecture	MCQ, Assignment, Short answer
		GPCR and Role of second messenger (cAMP)	4	Understood the role of GPCR and CAMP in the process of cell signalling		

SUGGESTED READINGS

• Karp, G. (2010). Cell and Molecular Biology: Concepts and Experiments. VI Edition. John Wiley and Sons. Inc.

• De Robertis, E.D.P. and De Robertis, E.M.F. (2006). Cell and Molecular Biology. VIII Edition. Lippincott Williams and Wilkins, Philadelphia.

• Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. V Edition. ASM Press and Sunderland, Washington, D.C.; Sinauer Associates, MA.

• Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. (2009). The World of the Cell. VII Edition. Pearson Benjamin Cummings Publishing, San Francisco.

• Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008). Molecular Biology of the Cell, V Edition, Garland publishing Inc., New York and London.

Name of teachers :

1) Prof. R. K. Rajeshwari Devi
2) K. Uma Devi
3) Dr. Chitra Devi
4) Dr. H. Binota Devi