

Programme	BS Biotechnology	Course Code	BCBT.101	Credit Hours	2+1
Course Title	Cell Biology				
Course Introduction					
This course will provide fundamental concepts in cell biology. understanding of structures and biological functions of cell organelles along with basic laboratory skills. This foundation in cellular biology is essential for understanding the complex functions of living organisms.					
Learning Outcomes					
On the completion of the course, the students will:					
<ul style="list-style-type: none">• Describe the structure and function of cellular organelles.• Explain the processes of cell division, differentiation and signaling.• Analyze the mechanisms of cellular communication and transport.					
Course Content					
<ul style="list-style-type: none">• Introduction to cell theory, What are cells? Discovery of cells, Basic properties of cells• Cell classification, Difference between eukaryotic and prokaryotic cells• Types and prokaryotic cells, Types of eukaryotic cells• Cell sizes and their components, Cellular components• The structure and function of biological molecules• Classification of biological molecules, Carbohydrate and Protein and nucleic acid• Membranes: Functions of membranes, Models of membrane structure• Membrane Lipids; Phospholipids, glycolipids, sterols• Fluidity of the membrane• Membrane proteins; integral proteins, peripheral proteins, lipid anchored membrane proteins• Glycosylated membrane proteins• Membrane receptors and transport mechanisms• Differences in prokaryotic and eukaryotic cell membranes• Nucleus; nuclear membrane and its organization, Nucleolus, Chromatin material; type of chromatin• Endoplasmic reticulum, Structure, function and its composition• Golgi apparatus, Structure, function and its composition• Ribosomes, Structure, function and its composition• Lysosome, Structure, function and its composition• Mitochondria, Structure, function and its composition• Chloroplast, Structure, function and its composition• Cell cycle, cell death• Mitosis and meiosis					
Practical Unit					
<ul style="list-style-type: none">• Microscopy,• Staining techniques,• Study of prokaryotic and eukaryotic cells,• Study of plant and animal cells• Cell structure in the staminal hair of <i>Tradescantia</i>• Study of different types of plastids• Cellular Reproduction in prokaryotic and eukaryotic cells					

<ul style="list-style-type: none"> • Mitosis • Smear/squash, staining and microscopy study and evaluation of onion roots 			
Textbooks and Reading Materials			
<ul style="list-style-type: none"> • Alberts B and Johnson A, Molecular Biology of the Cell, 6th Edition • Becker, Kleinsmith and Hardin, The World of the Cell, 6th Edition, Pearson Education. • Gerald Karp, Cell Biology, 7th Edition, Wiley Publishers. • Lodish et al, Molecular Cell Biology, 6th Edition, Freeman and Company, New York. • Cooper GM and Hausman RE, The Cell, a molecular Approach, 5th Edition 			
Teaching Learning Strategies			
<ul style="list-style-type: none"> • Lectures • Assignments and Presentations • Group discussions • Interactive sessions 			
Assignments: Types and Number with Calendar			
<ul style="list-style-type: none"> • Quiz in 4th week of 5 marks • Assignments in 8th week of 10 marks • Presentations in 12th week of 10 marks 			
Assessment			
Sr. No.	Elements	Weightage	Details
1	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.