



# CLUSTER UNIVERSITY SRINAGAR

SYLLABUS (FYUP UNDER NEP 2020)

**Offered By Department Of BIO-CHEMISTRY**

**Semester 2<sup>nd</sup> (Major Course)**

## ***Course Title: Cell Biology***

Course Code: UGBCH22J201

Credits: 4 (Theory: 3, Practical: 1)

Contact Hrs: 75 (Theory: 45, Practical: 30)

Max. Marks 100

Theory External: 60; Min Marks: 24

Theory Internal (Continuous Assessment): 15 Marks, Min Marks: 06

Practical Experimental Basis= 15, Min. Marks: 06

Practical Experimental (Continuous assessment) = 10, Min. Marks: 04

**Learning Objectives:** Introduction to basic components of prokaryotic and eukaryotic cells, cell membranes, cellular organelles, and their functions.

### **Learning Outcomes:**

After successful completion of the course, the students will be able to understand the basics of cell structure, differentiate between cell types including prokaryotic and eukaryotic cells and the various cellular organelles and their function.

### **Unit I: Cell wall and membranes**

**15 Hrs**

Structure of prokaryotic and eukaryotic cells. Overview of plant and animal cells, Composition, structure and functions of cell wall. Structure and composition of cell membranes, Fluid Mosaic Model, Membrane transport (Active and passive), Membrane channels, carriers, and transporters.

### **Unit II: Cell organelles I**

**15 Hrs**

Structure and functions of Nucleus: nuclear envelope, nuclear pore complex, nucleolus, Concept of chromatin and chromosome.

Endoplasmic Reticulum: RER structure and function- Brief overview of co-translational and posttranslational modifications of proteins; SER structure and function, brief overview of export of proteins from ER to Golgi

Golgi apparatus: organization, functions (role in protein secretion) brief overview of glycosylation of proteins within Golgi.

### **Unit III: Cell organelles II**

**15 Hrs**

Mitochondria: Structure and Function, Ribosomes- Structure and Function, Structure and function of lysosomes and peroxisomes, Cytoskeleton- Structure, assembly and function of Microtubules, Microfilaments and intermediate Filaments

### **Unit IV: PRACTICAL (Lab Course)**

**30 Hrs**

- 1) Microscopic observation of plant and animal cells
- 2) Bacterial Staining (Gram's staining)
- 3) Observation of cellular Morphology-Eukaryotic and Prokaryotic.
- 4) Blood group typing

### **SUGGESTED READINGS:**

- Molecular Biology of the Cell (2008) 5th ed., Alberts, B., Johnson, A., Lewis, J., and Enlarge, M., Garland Science (Princeton), ISBN: 0-8153-1619-4 / ISBN: 0-8153-1620-8.
- Cell and Molecular Biology: Concepts and Experiments. (2010). Karp, G., 6th ed. John Wiley and Sons. Inc. ISBN: 978-1-118-65322-7
- Essential Cell Biology (4th Edition) by Alberts et al.
- The Cell: A Molecular Approach (2013) 6th ed., Cooper, G.M. and Hausman, R.E., ASM Press & Sunderland (Washington DC), Sinauer Associates, MA, ISBN: 978-0-87893-30