

**Course Objectives:**

The objectives of the course are:-

1. To develop an advanced understanding of cell biology.
2. Focusing on the major processes within cells, including: cell signaling, regulation of cell shape, cell division, apoptosis and the functions of the endomembrane system.
3. To learning about how all living organisms develop, survive, evolve and work.

**Course Learning Outcomes:**

Upon successful completion of the course, the student will be able to:

1. Explain the main processes that occur within a eukaryotic cell.
2. Develop an ability to summarize, integrate and organize information.
3. Describe the tools with which cells are studied.
4. Describe research problems in other disciplines such as genetics, oncology and in terms of molecular biology.

**Course Contents:**

Introduction, surfaces and interfaces, chemical compositions. Structure of membranes. Isolation of membrane bound proteins, morphology and function of different biological membranes (plasma

membrane, mitochondrion, chloroplast, mesosome, endoplasmic reticulum, Golgi apparatus, lysosomes, tonoplast, nucleus). Membrane transport: active and passive transport. Membrane receptor-ligand interactions and pathways.

### **Teaching-Learning Strategies**

Teaching will be a combination of class lectures, class discussions, and group work. Short videos /films will be shown on occasion.

### **Assignments**

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

### **Assessments and Examination**

Sessional Work: 25 marks

Midterm Exam: 35 marks

Final term Exam: 40 marks

### **Text book**

1. Molecular Cell Biology (2007) 6<sup>th</sup> Ed.. H. Lodish, C.A. Kaiser, M.Krieger. M.P. Scott, A. Bretscher, H. Ploegh, and P. Matsudaira, W.H. Freeman.

### **Books Recommended:**

2. Biochemistry (2007) 6<sup>th</sup> Ed. by J.M. Berg, J.L. Tymoczko and L. Stryer W.H. Freeman and Co.
3. Molecular Biology of the Cell, (2008) 5<sup>th</sup> Edition .B. Alberts, A. Johnson, J. Lewis, M. Raff, K. Roberts and P. Walter 5<sup>th</sup> Ed. Garland Sciences, Taylor and Francis
4. Molecular Cell Biology (2007) 6<sup>th</sup> Ed.. H. Lodish, C.A. Kaiser, M.Krieger. M.P. Scott, A. Bretscher, H. Ploegh, and P. Matsudaira, W.H. Freeman.
5. Cell and Molecular Biology: Concepts and Experiments (2008) by G. Karp John Wiley and Sons

**UZO-582**

**Signal Transduction and Biomembranes (Lab.)**

**Cr. (1)**

### **Course Objectives:**

The objectives of the course are:-

1. To develop an advanced understanding of cell biology.
2. Focusing on the major processes within cells, including: cell signaling, regulation of cell shape, cell division, apoptosis and the functions of the endomembrane system.
3. To learning about how all living organisms develop, survive, evolve and work.

### **Course Learning Outcomes:**

Upon successful completion of the course, the student will be able to:

1. Explain the main processes that occur within a eukaryotic cell.
2. Develop an ability to summarize, integrate and organize information.
3. Describe the tools with which cells are studied.
4. Describe research problems in other disciplines such as genetics, oncology and in terms of molecular biology.

### **Course Contents:**

Introduction, surfaces and interfaces, chemical compositions. Structure of membranes. Isolation of membrane bound proteins, morphology and function of different biological membranes (plasma membrane, mitochondrion, chloroplast, mesosome, endoplasmic reticulum, Golgi apparatus, lysosomes, tonoplast, nucleus). Membrane transport: active and passive transport. Membrane receptor-ligand interactions and pathways.

## **Teaching-Learning Strategies**

Teaching will be a combination of class lectures, class discussions, and group work. Short videos /films will be shown on occasion.

## **Assignments**

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

## **Assessments and Examination**

Sessional Work: 25 marks

Midterm Exam: 35 marks

Final term Exam: 40 marks