

# Postgraduate Course Book

**Department: Biology** 

**College: Education** 

**University: Salahaddin University** 

Subject: Advanced Cell Biology

Course Book Level: MSc Students; First semester

Lecturer's name: Treefa Farouq Ismail

Academic Year: 2023/2024

# **Course Book**

1. Course name	Advanced Cell Biology
2. Lecturer in charge	Dr. Treefa Farouq Ismail
3. Department/ College	Biology/ Education
4. Contact	07504821149
5. Time (in hours) per	Theory: 2 hrs
week	Practical:
6. Office hours	
7. Course code	
8. Teacher's academic	Education:
profile	<ul> <li>BSc in Biology (1993–1994), College of Education, Salahaddin University-Erbil</li> <li>MSc in Histology (2003-2004), College of Education, Salahaddin University- Erbil</li> <li>PhD in Cell Biology (2013-2014), College of Education, Salahaddin University-Erbil</li> </ul>
	Teaching experience:
	<ul> <li>Histology and Embryology (2nd Class, Department of Biology, College of Education)</li> <li>Cell Biology (4th Class Department of Biology, College of Education)</li> </ul>
	- General Biology (M.Sc. students, Department of General Science, College of Basic Education)
	<ul> <li>Advance Cell Biology (M.Sc. students, Department of Biology, College of Education)</li> <li>Advance Cell Biology (Ph.D. students, Department of Biology, College of Education)</li> </ul>
9. Keywords	Cell Structure and Function, Cellular Receptors, Signaling Molecules,
	Cancer Cell, Stem Cells

## **10.** Course overview:

The focus of Cell Biology is the study of the structure and function of the cell. In this course we will focus on Eukaryotic cell biology and will cover topics such as membrane structure and composition, transport, and trafficking; the cytoskeleton and cell movement; cell receptors and the integration of cells into tissues. We will also cover important cellular processes such as cell cycle regulation, signal transduction, apoptosis (programmed cell death), stem cell and cancer cell biology. Throughout the semester we will attempt to relate defects in these various cellular processes to human diseases to help gain a better understanding for what happens when cells don't work as they should.

## 11. Course objective:

1- To increase each student's knowledge of basic cell structure and function.

2- To understand more advanced cellular functions, such as regulation of membrane transport, cell signalling, cell death and cellular differentiation.

3- To understand the importance of the cell in biology, and to be able to fit prior knowledge of biology into the context of cell function.

4- To gain experience and understanding of microscopy (light and electron microscopy), basic histological techniques, and other methods of cell visualization.

5- To study some pathological conformational features of the cell.

12. Student's obligation The role of student and their obligation throughout the academic year include: Quizzes Seminar

Monthly Examination

Final Examination

## **13.** Forms of teaching

Lectures, Presentation, Seminar, Exam

# 14. Assessment scheme

#### **15. Student learning outcome:**

# Identify and explain a variety of cellular components

Understand why and how the light microscope and electron microscope are used in biology Identify membrane-bound organelles found in eukaryotic cells

Demonstrate familiarity with various components of the cytoskeleton.

Demonstrate familiarity with various cell surface specializations

## Describe and explain the structure and function of membranes

Describe the structure and function of membranes, especially the phospholipid bilayer Distinguish between passive and active transport; explain how substances are directly transported across a membrane

Describe the primary mechanisms by which cells import and export macromolecules

# Identify the main components of a signal transduction pathway

Differentiate between different types of signals

Describe how a cell propagates a signal

Describe how a cell responds to a signal

Describe how a cell responds to a signal

## 16. Course Reading List and References:

1- Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K. and Walter, P. (2002) Molecular Biology of the Cell (4th edn), Garland Science, New York.

2- Alberts B, Bray D, Johnson A et al. (1997) Essential Cell Biology. London: Garland Publishing.
3- General · Celis JE (ed) (1998) Cell Biology: A Laboratory Handbook, 2nd edn. · Lacey AJ (ed) (1999) Light Microscopy in Biology: A Practical Approach, 2nd edn.

17. Topics Program		
	Lecture's	
	Name	
Week 1: Introduction to Cell Biology		
Week 2: Cell Organelle Structure and Function		
Week 3: Transport Across Cell Membrane		
Week 4: Cell Connection		

Week 5: Cell Cycle and Division	
Week 6: Signalling Molecules	
Week 7: Cellular Receptors	
Week 8: Cells in Motion	
Week 9: Cellular change and adaptation	
Week 10: Cell Death	
Week 11: Stem cells	
Week 12: Cancer Cells	
18. Grading procedure	
Seminar Presentation= 10 Scientific Report= 10 Quiz= 5 Activity= 5 Midterm Examination= 20 Final Examination= 50 Total Score= 100	
<b>Quiz</b> Midterm Examination Final Examination	

21. Peer review \*

20. Extra notes:

\* Must have permission of the Scientific and Higher Education Committee