



Course Specification

— (Bachelor)

Course Title:	Cell Biology
Course Code:	MLS26393
Program:	Medical Physics
Department:	Physics
College:	Science
Institution:	University of Bisha
Version:	1
Last Revision Date:	5 September 2023



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A. General information about the course:

1. Course Identification

1. Credit hours:	2 (2+0)				
2. Course type					
A.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>	Track <input type="checkbox"/>	Others <input type="checkbox"/>
B.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>				
3. Level/year at which this course is offered:	5 th Level / 3 rd year				
4. Course general Description					
This course explores the intricate machinery and dynamic processes of cells with an emphasis on the biophysical principles underlying cellular structure, mechanics, and function.					
5. Pre-requirements for this course (if any):					
NA					
6. Co- requirements for this course (if any):					
NA					
7. Course Main Objective(s)					
<ul style="list-style-type: none"> • Understand the fundamental concepts of cell structure and dynamics. • Apply biophysical methods to analyze cellular components and processes. • Critically evaluate recent research in cell biology from a biophysical perspective. • Develop experimental and quantitative skills relevant to biophysical investigations of cells 					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	10	33%
2.	Interactive lectures	10	33%
3.	Seminars & journal club	6	20
4.	E-learning: Discussion forum	4	14%

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	20
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others: Seminars, Journal club and discussion forum	10



Total	30
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B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Explain the cellular mechanisms and biophysical principles that drive the complex processes within cells, integrating concepts from classical and modern physics.	K1	Traditional classroom & Interactive lectures	Written exam, Assignments, Case study analysis
1.2	Identify and describe advanced research techniques in cell biology, including microscopy, spectroscopy, and computational modeling, and understand their role in advancing medical biophysics	K2		
2.0	Skills			
2.1	Utilize critical thinking to apply theoretical biophysical concepts to cellular systems, analyzing and interpreting experimental data to develop new hypotheses.	S1	Interactive lectures, Traditional classroom, Seminars and journal clubs,	Case study analysis, Seminar assessment rubric, Journal club assessment rubric
2.2	Develop communication skills to effectively discuss cell biology concepts and research findings	S3		





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	both with peers and in interdisciplinary settings.			
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate academic integrity and adhere to ethical standards in conducting and presenting biophysical research on cellular systems.	V1	Seminars & journal club, Interactive lectures, online discussion forum	Assignments, Seminar assessment rubric, forum assessment rubric, Peer assessment
3.2	Independently design and execute cell biology experiments, reflecting on continuous self-improvement and professional growth within the field of biophysics.	V2		
3.3	Engage in collaborative projects, appreciating the role of cell biology in broader medical and societal challenges, to contribute constructively to scientific and societal progress	V3		

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Cell Biology	2
2.	Chemical Foundations of Cells	2
3.	Biophysics of Cell Membrane	2
4.	Protein Structure and Dynamics	2
5.	Cytoskeleton Mechanics	2
6.	Motor Proteins and Cellular Movement	2
7.	Cellular Adhesion and Extracellular Matrix	2





8.	Mechanotransduction	2
9.	Biophysics of Cellular Organelles	2
10.	Signal Transduction	2
11.	Cell Cycle and Division	2
12.	Apoptosis and Cell Death Mechanisms	2
13.	Biophysical Techniques in Cell Biology	2
14.	Quantitative and Computational Approaches	2
15.	Current Trends and Advanced Topics in Cell Biology	2
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments.	3, 5	10 %
2.	Seminars / Journal clubs	4, 7	10 %
3.	Online discussion forum	6, 9	10%
4.	First term exam	8	15 %
5.	In-class activities	All through	5%
6.	Final exam	End of Semester	50 %

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	- Molecular Biology of the Cell" by Alberts et al
Supportive References	Physical Biology of the Cell" by Phillips, Kondev, and Theriot
Electronic Materials	Current articles and reviews from scientific journals
Other Learning Materials	SDL

2. Required Facilities and equipment

Items	Resources
facilities	Classrooms





Items	Resources
(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	
Technology equipment (projector, smart board, software)	Projector or smart board
Other equipment (depending on the nature of the specialty)	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Extent of achievement of course learning outcomes.	Teachers, students.	Direct (Final exams), Indirect (Questionnaire).
Effectiveness of teaching.	Teachers, students.	Indirect (Questionnaire)
Effectiveness of assessment.	Teachers, students.	Indirect (Questionnaire)
Quality of learning resources	Teachers, students.	Indirect (Questionnaire)
Quality of facilities available	Teachers, students.	Indirect (Questionnaire)
Fairness of evaluation	Peer reviewer.	Direct (Final exams reevaluation).

G. Specification Approval Data

COUNCIL /COMMITTEE	College of Science Council
REFERENCE NO.	1
DATE	5 September 2023

