BCH 601 (Advances in applied biochemistry)

This course covers an introduction to secondary metabolites and their chemical structure, properties and function. It also covers the classification of antibiotics, usage, isolation and purification, characterization, structural and functional properties, mode of action and resistance from the chemical and biochemical point of view.

Main Objective

1. Equip students with in-depth knowledge of advanced methods and techniques for separating and purifying biomolecules.
2. Develop expertise in designing and applying biochemical sensors for analytical and diagnostic purposes.
3. To learn biochemical fuel cells' principles and practical applications in energy and healthcare systems.
4. To understand bioremediation and biodegradation strategies for environmental sustainability.
5. To learn about industrial carbohydrate applications, including their use in food, pharmaceuticals, and materials science.
6. Provide insights into the biochemical roles and identification of eicosanoids, heat shock proteins, and interferons.
7. To study the principles and applications of enzyme immobilization in bioprocessing and industrial catalysis.
8. To foster expertise in biochemistry's practical and industrial applications, preparing students to address real-world challenges in research and industry.

Course Learning Outcomes

1.0 Knowledge and understanding

1.1	To understand bioremediation and biodegradation strategies for environmental sustainability.
1.2	To learn about the industrial carbohydrate applications, including their use in food, pharmaceuticals, and materials science.
1.3	Provide insights into the biochemical roles and identification of eicosanoids, heat shock proteins, and interferons.
1.4	To studied the principles and applications of enzyme immobilization in bioprocessing and industrial catalysis.
1.5	Advance the understanding of biomolecular electrode technology for biosensors and bioenergy systems.

2.0 Skills

2.1	Literature Survey
2.2	Data analysis and interpretation
2.3	Oral presentation skills

3.0 Values, autonomy, and responsibility

3.1	Recognize the importance of academic integrity and various modern techniques necessary for developing the field of applied biochemistry
3.2	Develop scientific communication and interaction abilities
3.3	Gain knowledge of current research in biochemistry

Course Content

No	List of Topics	Contact Hours
1.	Principles and techniques for the separation and purification of biomolecules.	3
2.	Biochemical sensors for diagnostic and industrial purposes.	3
3.	Biochemical fuel cells, including their mechanisms, designs, and potential for sustainable energy applications.	3
4.	Biochemical basis of bioremediation and biodegradation for environmental applications.	4
5.	The industrial applications of carbohydrates in food, pharmaceuticals, and material science.	3
6.	Eicosanoids, heat shock proteins, and interferon identification.	4
7.	Applications of enzyme immobilization.	3
8.	Biomolecular electrode technology.	3
9	Presentation skills	4
Total		**30**

Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	1st Assessment exam		20
2.	2nd Assessment exam		20
3.	Homework (S2)		20
4.	Oral Presentation (S4)		20
5	Final exam		20

Essential References	Access to a wide range of academic journals, books, and research papers relevant to various disciplines