

ENF106 BIOCHEMISTRY

Semester Credits:	4
In-class Hours:	96
Out-of-Class Hours:	48
Level:	2 nd year

OVERVIEW

What is it?

Biochemistry is a science that studies the chemistry of living things, especially proteins, carbohydrates, lipids and nucleic acids. It is the science that studies the chemical basis of life: the molecules that compose the cells and tissues, which catalyze chemical reactions, cellular metabolism and digestion, photosynthesis and immunity, among other things.

What problems are addressed?

Biochemistry is a fundamental pillar of biotechnology, and has become an essential discipline to address major disease problems both current and future, such as climate change, scarcity of agricultural resources to global population growth, depletion of fossil fuel reserves, the emergence of new forms of allergies, increased cancer, genetic diseases, obesity, etc..

What is the end goal?

Train professionals to possess high scientific and technical skills, to be able to conduct investigations, experiments, tests and analyzes of the composition, functions and chemical processes of living organisms, both to increase the knowledge in this field, such as for use in industry, medicine and public health.

Purpose?

Not only does it deal with the transmitting of knowledge or how to generate knowledge but also with the transforming of society and answering their needs and also in the integral formation of their students as professionals and citizens.

Why does it matter?

It is closely related to the morphological sciences such as cytology, plus there is a close relationship with biology and physics.

OBJECTIVES

Know and explain the different biochemical reactions, biochemical phenomena, the regulating interactions and relationships and mechanisms of different metabolic pathways that make life possible, social responsibility and commitment and the alternative pathology that occur in professional life.

1. Provide insightful and an updated methodology in the field of Biochemistry and Molecular Biology, especially in the study of nucleic acids and proteins.
2. Update students on relevant developments and technologies in Biochemistry and Molecular Biology of Plants.
3. Provide solid information of the molecular mechanisms of disease.
4. Present recent advances in the design of therapeutic approaches.

CONTENT

Identify the different mechanisms that regulate life and cellular composition and biochemical phenomena that govern life for the student to be master of this knowledge.

KNOWLEDGE	SKILLS	VALUES
UNIT I: OVERVIEW		
Learn and analyze the terminology of biochemical.	Knowing biochemical terminology	Human Ethical Responsible Moral Just
Concepts and history of biochemistry as a science including mass, atom, state of matter of the elements, and elements	Express concepts, classify and name	
Chemical bonds, chemical composition of living matter. Cells generalities.		
UNIT II: ORGANIC CHEMICALS		
Meet, explains, predicts and lists the main functions of the organic chemicals, its importance, and characteristics.	Know and differentiate the bioelements that are a part of living beings.	
PROTEINS: Concept, importance Amino fundamental components: concept and importance, properties. Essential and nonessential amino acids: functions enzymes: concept, classification and importance.	Express concepts, importance, and amino acid properties	
LIPIDS: concept lipid metabolism function digestion absorption role of lipoproteins metabolism of triglycerides and cholesterol	Express concepts and importance and properties of Carbohydrates Lipids	
CARBOHYDRATES: concept importance classification Krebs cycle glucose metabolism		

UNIT III BLOOD AND BLOOD COMPONENTS:	Express concepts and important properties of Carbohydrates	Identify blood components, and their values
Learn and analyzes biochemical terminology.		
BLOOD: components functions of plasma proteins, clotting factors fetal maternal incompatibility blood group		
UNIT IV: METABOLISM & ELECTROLYTES		
Differentiate water components and major body electrolytes	Know and differentiate the components of water and electrolytes in the body	
Learning Cycle		
properties, distribution, function, water balance, exchange fluid, electrolyte, electrolyte disturbances... bodily fluids, bile, urine	To develop skills in the use of laboratory instruments	
UNIT V: IMMUNE SYSTEM		
Learn the components	Learn the components of the immune system and their roles in the defense of health maintenance.	
Immunity: definitions, Immunoglobulin classes. Hypersensitivity cytokines, to Vaccines		

EVALUATION SYSTEM

TECHNICAL:	INSTRUMENTS	OPERATIONAL INDICATORS	QUALITY STANDARDS
Observation Interview Survey Evidence	Guided observation Guided written questionnaire interview, oral or practical	Level results level responses Level analysis level of knowledge, skills and values	Effectiveness Efficiency Relevance Impact Optimization

INITIAL EVALUATION:

Lessons oral, written, workshops, exhibitions. Each activity is worth 15pts, leading to a cumulative final test 60 pts which added to the final exam worth 40pts equals 100pts

BIBLIOGRAPHY

AUTHOR	TITLE	YEAR	VOL
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Murray, R.K. et al.	Harper's Illustrated Biochemistry	2004	El Manual Moderno, Mexico
Laguna, J.	Biochemistry	1993	3rd. ed. La Prensa Medica Mexicana, Mexico.
Mcgilber, R.	Biochemical Applications. Clinics	1996	3ra. ed. Edit. Interamericana, México. 1986.
Díaz Portillo, Jacobo.	Basics of Clinical Biochemistry	2007	Ediciones Díaz De Santos. 2007.
Lehninger, D.	Biochemistry	1979	2da. ed. Edit. Omega; España