

THOMAS ADEWUMI UNIVERSITY**COURSE OUTLINE**

Faculty	Computing and Applied Sciences
Department	Biological Science
Course Title	GENERAL BIOCHEMISTRY I
Year of Study	2
Course Code	BCH 201
Credit Hours	2
Contact Hours	30
Mode of Delivery	Classroom Lectures
Mode of Assessment	Weight%
Continuous Assessment	40%
Final Examination	60%
Total	100%
Course Lecturer and Instructor(s)	Dr A.T. Bamigbade
Course Description	<p>Biochemistry involves the study of life. The three (3) known domains of life such as archaea, prokaryote, and eukaryote are composed of cells classified. All cells are composed of five (5) basic chemical elements abbreviated as C, H, O, N, and P; based on those elements identified in the four (4) biomacromolecules viz: protein, lipid, carbohydrate, and nucleic acids. Some cells are composed of organelles such as nucleus, mitochondria and many more and they are studied by cell fractionation using ultracentrifuges. According to literature, water occupies larger percentage of a cell and water molecules interact through formation of hydrogen bonds.</p> <p>For a biochemistry student, it is important to be familiar with all the above at the introductory stage.</p>
Course Objective and	<p>This course would enable the understanding of the following:</p> <ol style="list-style-type: none">1. The fundamental meaning of domains of life, cell and overall molecular descriptions and composition of cell2. Ultracentrifugation as the basic methodology used in cell fractionation3. Introductory chemistry of elements comprising biomacromolecules and chemistry of water
Learning Outcomes	<p>By the end of the course, students will be able to:</p> <ol style="list-style-type: none">1. List the three domains of life2. Understand cell as the basic unit of life

	<ol style="list-style-type: none"> 3. Comprehend to a greater extent the fine line between the three (3) domains of life 4. Understand what organelles are and how they can be isolated using a typical ubiquitous organelle such as lipid droplet as an example 5. Highlight the various percentages of water present across the three (3) domains of life 6. Comprehend how molecular water aggregate and chemical principle (majorly hydrogen bond) underlying this condensation 7. Give an overview of life with a better level of insight 	
Teaching and Learning	The class will meet for 2 hours each week. Class time will be used for a combination of lecture, classwork and tutorials	
Detailed Course Content	The Cell Theory: Cell Types; Constancy and diversity. Cell Organelles: Structure and Functions of major cell components. Prokaryotes versus Eukaryotes. Chemical composition of cells: centrifugation, methods of cell fractionation; structure; function and fractionation of intra-cellular organelles. Water: Structure; Physical and solvent properties and hydrogen bonding of water; hydrophilic interactions; ionization and ion products of water	
Course Content Sequencing		
Weeks	Detailed Course Outline	Allowed Time
Week1	<ol style="list-style-type: none"> 1. The three (3) domains of life <ul style="list-style-type: none"> • archaea • prokaryote • eukaryote 	2 Hours
Week2,3,4	<ol style="list-style-type: none"> 2. Cell as the basic unit of life <ul style="list-style-type: none"> • Cell types across the domains of life • Structure function of major cell component such as membrane, organelles and cytosol 3. Distinction between prokaryote and eukaryote <ul style="list-style-type: none"> • Based on lack of well a defined nucleus and intracellular organelle although this Is changing with the discovery of ubiquitous organelle called lipid droplets • Unicellular as opposed to complex multicellular attribute and many more 4. Continuous assessment I 	8 Hours
Week 5,6,	5. Chemical composition of cells	4 Hours
Weeks7,8,9	6. Cell fractionation to identify various intracellula compartments / organelles	10 Hours

Week 10,11,12	7. Properties of water 8. Continuous Assessment II	6 Hours
After Week 12	9. Examinations	
Recommended Reading Material <ol style="list-style-type: none"> 1. Reginald Garrett and Charles Grisham (2010). <u>Biochemistry</u>. Brooks/Cole, Cengage Learning 2. David Nelson and Michael Cox (2016). <u>Principles of Biochemistry</u>. McGrawHill education 3. Victor Rodwell, David Bender, Kathleen Botham, Peter Kennelly, and Anthony Weil (2018). <u>Harper's Illustrated Biochemistry</u>. McGrawHill education lange 		

Course Code: BCH 201

Course Title: General Biochemistry I

Preamble: Biochemistry involves the study of life. The three (3) known domains of life such as archaea, prokaryote, and eukaryote are composed of cells classified. All cells are composed of five (5) basic chemical elements abbreviated as C, H, O, N, and P; based on those element identified in the four (4) biomacromolecules viz: protein, lipid. carbohydrate, and nucleic acids. Some cells are composed of organelles such as nucleus, mitochondria and many more and they are studied by cell fractionation using ultracentrifuges. According to literature, water occupies larger percentage of a cell and water molecules interact through formation of hydrogen bonds.

For a biochemistry student, it is important to be familiar with all the above at the introductory stage. **Specific Course Objective/Learning Outcomes**

This course would enable the understanding of the following:

1. The fundamental meaning of domains of life, cell and overall molecular descriptions and composition of cell
2. Ultracentrifugation as the basic methodology used in cell fractionation
3. Introductory chemistry of element comprising biomacromolecules and chemistry of water.

A. Learning Activities/ Course Delivery Methods

1. **Lectures: Detailed content of course are taught in class**

Course Content: The Cell Theory: Cell Types; Constancy and diversity. Cell Organelles: Structure and Functions of major cell components. Prokaryotes versus Eukaryotes. Chemical composition of cells: centrifugation, methods of cell fractionation; structure; function and fractionation of intra-cellular organelles. Water: Structure; Physical and solvent properties and hydrogen bonding of water; hydrophilic interactions; ionization and ion products of water.