

SEMESTER ONE (SB016)
CELL STRUCTURE, GENETICS AND DEVELOPMENT

TOPIC	LEARNING OUTCOMES	REMARKS	HOUR
1.0 MOLECULES OF LIFE	At the end of this topic, students should be able to:		7
1.1 Water	(a) Explain the structure of water molecule. (b) Describe the properties of water and its importance: universal solvent, low viscosity, high specific heat capacity, high latent heat of vaporization, high surface tension, maximum density at 4°C.	Emphasize on the polarity and the formation of the hydrogen bond. Adhesive and cohesive forces should be explained for surface tension.	1
1.2 Carbohydrate	(a) Describe various forms and classes of carbohydrates such as monosaccharides, disaccharides and polysaccharides. (b) Describe the formation and breakdown of maltose. (c) Describe the structures and functions of starch, glycogen and cellulose.	Describe the formation of α-1,4 glycosidic bond. State the types of glycosidic bonds found.	1½
1.3 Lipids	(a) State the types of lipid: fat, oil, phospholipids and steroids. (b) Describe the structure of fatty acids and glycerols. (c) Describe the formation and breakdown of triglycerides.		1
1.4 Proteins	Describe the basic structure and classes of amino acids (a) Explain how amino acids are grouped. (b) Describe the formation and breakdown of dipeptide. (c) Explain primary (1°), secondary (2°), tertiary (3°) and quaternary (4°) levels of proteins and the types of bonds involved. (d) Explain the effect of pH and temperature on the structure of protein. (e) Classify proteins according to their structure.	4 groups (polar, non-polar, acidic and basic) e.g.: tertiary (myoglobin), quaternary (haemoglobin). Classes of protein should be limited to conjugated, fibrous and globular.	2
1.5 Nucleic acids	(a) Describe the structure of nucleotide as the basic composition of nucleic acid (DNA and RNA). (b) Describe the structure of DNA based on the Watson and Crick Model. (c) State the types and function of RNA. (d) State the differences of DNA and RNA.	Emphasise the importance of 3' and 5' ends (antiparallel). State the bonds involved.	1½