

## CHAPTER OUTLINES

TOPIC	LEARNING OUTCOMES	HOUR
<b>6.0 EXPRESSION OF BIOLOGICAL INFORMATION</b>	<b>At the end of this topic student should be able to :</b>	<b>5</b>
6.1 DNA and genetic Information	(a) explain DNA as the carrier of genetic information  (b) explain the concept of one gene one polypeptide	½
6.2 DNA replication	(a) Describe the semi-conservative replication of DNA	1 ½
	(b) Describe DNA replication during cell division.  i. Overview of DNA strand ii. Unwinding of strand iii. Replication: semi-conservative iv. Each strand act as template v. Free DNA nucleotide join up to the exposed bases by specific base pairing vi. Formation of leading and lagging strands (Okazaki fragments) vii. Formation of new strand is from 5' to 3' viii. Formation of 2 identical copies of the original DNA	
6.3 Protein synthesis : Transcription and translation	(a) Overview the roles of transcription and translation in the flow of genetic information.  (b) Explain transcription.  (c) Describe the stages involved: i. initiation ii. elongation iii. termination	2

	<p>(d) State the formation of mRNA strand from 5' to 3'.</p> <p>(e) Describe the relationship between base sequences in codons with specific amino acids using genetic code table</p> <p>(f) Explain translation in protein synthesis.</p> <p>(g) Describe the stages involved:</p> <ol style="list-style-type: none"> <li>i. initiation</li> <li>ii. elongation (codon recognition, peptide bond)</li> <li>iii. formation and translocation)</li> <li>iv. termination</li> </ol>	
<p>6.4 Gene regulation and expression –<i>lac Operon</i></p>	<p>(a) Explain the concept of Operon and gene regulation</p> <p>(b) Describe the components of <i>lac</i> operon and its function in <i>E. coli</i>.</p> <p>(c) Describe the mechanism of the operon in the absence and presence of lactose</p>	<p>1</p>