

Module code	SB-4340		
Module Title	Nutritional Biochemistry		
Degree/Diploma	Bachelor of Science (Biology)		
Type of Module	Major Option		
Modular Credits	4	Total student workload	8 hours/week
		Contact hours	6 hours/week
Prerequisite	None		
Anti-requisite	None		
Aims			
This module will highlight the contribution of nutrition in regulating biological processes vital for life. Interaction of dietary components at the molecular level and the subsequent biochemical changes will be discussed. Gene-nutrients interaction and signal transduction induced by nutrients will be explained to demonstrate the role of nutrition in maintaining proper growth, development and physiological function.			
Learning Outcomes:			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order :	20%	<ul style="list-style-type: none"> - Understand the mechanisms by which nutrients regulate chromatid remodelling. - Demonstrate the mechanisms of gene transcription and translation affected by nutrients. - Describe the experimental methodologies applied to assess how nutrients influence gene expression. 	
Middle order :	60%	<ul style="list-style-type: none"> - Explain the mechanisms by which macro and micro nutrients induce endocrine responses. - Demonstrate the role of different nutritional component in tissue growth and development and relate these to all stages of the lifespan. - Apply the concept of nutrigenetics and nutrigenomics in nutrition research. 	
Higher order:	20%	<ul style="list-style-type: none"> - Decipher the molecular basis of diseases affected by nutrition. - Conduct research in the field of personalized nutrition to improve the health of population. 	
Module Contents			
<ul style="list-style-type: none"> - Gene organisation and structure - Nutrition and Epigenetics (nutrients that affect DNA methylation, histone acetylation, and chromatid remodelling) - Nutritional regulation of gene expression - Common techniques used in nutritional biochemistry to assess gene expression - Nuclear Receptors (biochemical processes by which nutrients and hormones act directly and regulate tissue growth and metabolism) - Molecular interactions of carbohydrates and lipids (role of carbohydrate and lipid metabolites in regulating cellular signalling) - Amino acids (amino acid biosynthesis, metabolism, and nutritional role of essential and non-essential amino acids) - Dietary trace elements (biochemical significance of selenium, zinc, iron, iodine) - Major endocrine organs affected by nutrients (thyroid gland and pancreas) - Antioxidants and health supplements (biochemical properties of dietary supplements) - Nutritional status and diseases (cancer, diabetes, cardiovascular diseases, osteoporosis, birth defect) - Nutrigenetics and Nutrigenomics - Personalized nutrition (genetic makeup to customize diet and use of predictive markers to prevent nutritionally-related diseases) 			
Assessment	Formative assessment	Tutorial assignments and feedback	
	Summative assessment	Examination: 50%	

		Coursework: 50% - 3 practical reports (30%) - 2 class tests (20%)
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