



**UNIVERSITI TEKNOLOGI MARA**

**BIO260: BIOLOGICAL SYSTEMS**

<b>Course Name (English)</b>	BIOLOGICAL SYSTEMS <b>APPROVED</b>
<b>Course Code</b>	BIO260
<b>MQF Credit</b>	4
<b>Course Description</b>	This course focuses on the structure, process and function of selected biological systems in animals and plants.
<b>Transferable Skills</b>	Knowledge Thinking and scientific skills
<b>Teaching Methodologies</b>	Lectures, Practical Classes, Tutorial
<b>CLO</b>	CLO1 Describe the structure, process, function of tissues and systems in animals and plants. CLO2 Explain the structure, process, function of tissues and systems in animals and plants. CLO3 Outline written report on scientific experiments in area of tissues and systems in animals and plants.
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. SYSTEM IN ANIMALS : Animal Tissues</b> 1.1) Epithelium tissue 1.2) Connective tissue 1.3) Muscle tissue 1.4) Nervous tissue	
<b>2. SYSTEM IN ANIMALS : Homeostasis and Excretory System</b> 2.1) Maintaining the internal environment – thermoregulation, glucose level 2.2) Types of nitrogenous wastes 2.3) Excretory structures - protonephridia, metanephridia, Malphigian tubules, kidney.	
<b>3. SYSTEM IN ANIMALS : Respiratory System</b> 3.1) Characteristics of respiratory surfaces 3.2) Respiration in Fish – gills, countercurrent exchange 3.3) Respiration in Insect – tracheal system 3.4) Respiration in Amphibians – skin and lungs 3.5) Respiration in Birds - lungs 3.6) Respiration in Mammals – lungs, breathing mechanism, tidal volume, residual volume	
<b>4. SYSTEM IN ANIMALS : Circulatory and Transport System</b> 4.1) Open and closed circulatory system 4.2) Single and double circulatory system 4.3) Carbon dioxide and oxygen transport	
<b>5. SYSTEM IN ANIMALS : Digestive System</b> 5.1) Types of feeding – suspension feeder, fluid feeder, substrate feeder, bulk feeder 5.2) Stages of food processing – ingestion, digestion, absorption, egestion 5.3) Human digestive system – structure and process	
<b>6. SYSTEM IN ANIMALS : Immune System</b> 6.1) Innate Immunity (nonspecific immunity) 6.2) • First line defense mechanism 6.3) • Phagocytic cells, natural killer cells, interferons, inflammatory response 6.4) Adaptive Immunity (specific response) 6.5) • Humoral and cell mediated responses	

<p><b>7. SYSTEM IN ANIMALS : Nervous System</b>  7.1) Neurons: structure and function  7.2) Transmitting information along the neuron  7.3) Neural signaling across synapses</p>
<p><b>8. SYSTEM IN ANIMALS : Endocrine System</b>  8.1) Major human endocrine glands  8.2) Hormones and their functions</p>
<p><b>9. SYSTEM IN ANIMALS : Skeletal and Muscular System</b>  9.1) Types of skeleton – hydroskeleton, exoskeleton, endoskeleton  9.2) Ultrastructure of muscle  9.3) Physiology of muscle contraction</p>
<p><b>10. SYSTEM IN ANIMALS : Reproduction</b>  10.1) Asexual and sexual reproduction  10.2) Internal and external fertilization  10.3) Oviparity, ovoviviparity, viviparity</p>
<p><b>11. SYSTEM IN PLANTS : Plant Tissues</b>  11.1) Meristematic tissue  11.2) Dermal tissue  11.3) Ground tissue  11.4) Vascular tissue</p>
<p><b>12. SYSTEM IN PLANTS : Reproduction and Growth</b>  12.1) Asexual reproduction  12.2) Sexual reproduction  12.3) • Structure of flower  12.4) • Pollination  12.5) • Double fertilization  12.6) Primary and secondary growth</p>
<p><b>13. SYSTEM IN PLANTS : Transport in Vascular Plant</b>  13.1) Uptake and transport of water and minerals  13.2) Uptake and transport of organic substances</p>
<p><b>14. SYSTEM IN PLANTS : Plant Hormones</b>  14.1) Uptake and transport of water and minerals  14.2) Uptake and transport of organic substances</p>
<p><b>15. SYSTEM IN PLANTS : Plant Response to Stimuli</b>  15.1) Types of plant response  15.2) • Tropism, Nastic, Taxis  15.3) Photoperiodism and flowering</p>

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Quiz	Quiz	10%	CLO1
	Test	Test	5%	CLO2
	Test	Test	10%	CLO1
	Written Report	Laboratory report	15%	CLO3

Reading List	Reference Book Resources	<ul style="list-style-type: none"> <li>• Eldra Solomon, Linda Berg, Diana Martin 2010, <i>Biology</i>, 9 Ed., Cengage Learning [ISBN: 0538741252]</li> <li>• Neil A. Campbell, Jane B. Reece, Lisa A. Urry 2011, <i>Biology</i>, 9th Ed., Pearson Education [ISBN: 0321739752]</li> <li>• Elaine Nicpon Marieb 2009, <i>Essentials of Human Anatomy and Physiology</i>, Benjamin-Cummings Publishing Company [ISBN: 0321513533]</li> <li>• Frederic Martini 2004, <i>Fundamentals of Anatomy &amp; Physiology</i>, Pearson College Division [ISBN: 0130615684]</li> </ul>
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	