



UNIVERSITI TEKNOLOGI MARA

BIO560: ANIMAL PHYSIOLOGY

Course Name (English)	ANIMAL PHYSIOLOGY APPROVED
Course Code	BIO560
MQF Credit	4
Course Description	This course builds upon fundamental principles of animal/human physiology. Emphasis on basic physiological mechanisms of control regard to neural, endocrine, renal, cardiovascular, respiratory and gastrointestinal. Objectives of the course includes (i) demonstrating the coordination of physiological processes that underlies homeostasis or the maintenance of a stable internal environment (ii) explaining the role of different organ systems in maintaining homeostasis.
Transferable Skills	1. Practical skills. 2. Values and attitudes. 3. Problem solving and scientific reasoning.
Teaching Methodologies	Lectures, Lab Work
CLO	CLO1 Display work responsibility to any assigned task. CLO2 Demonstrate a working knowledge of physiological terminologies and mechanisms by laboratory activities. CLO3 Compare the maintenance of homeostasis in different systems and conditions.
Pre-Requisite Courses	No course recommendations
Topics	
1. Homeostasis and Integration 1.1) 1.1 Introduction to homeostasis 1.2) 1.2 Regulatory mechanisms for homeostasis 1.3) LAB 1 Fundamental Physiological Principles	
2. Cell Signalling and Endocrine Regulation 2.1) 2.1 Types of Cell Signaling 2.2) 2.2 Chemical Classes of Signalling Factors 2.3) 2.3 Ligand-Receptor Interaction 2.4) 2.4 Signal Transduction Pathways 2.5) 2.5 Introduction of Endocrine System 2.6) 2.6 Regulation of Cell Signaling 2.7) 2.7 Regulation of Glucose Metabolism 2.8) 2.8 The Vertebrate Stress Response 2.9) LAB 2 Insulin Regulation of Blood Glucose	
3. Thermal Physiology 3.1) 3.1 General principles of thermal physiology 3.2) 3.2 Thermal adaptation 3.3) 3.3 Thermogenesis 3.4) 3.4 Regulation of body core temperature	
4. Fluid and Acid-Base Balance 4.1) 4.1 Osmoregulation 4.2) 4.1.1 General concepts of osmoregulation 4.3) 4.1.2 Osmoconformers and osmoregulators 4.4) 4.1.3 Osmotic and volume balance in mammals 4.5) 4.2 Acid-base balance 4.6) 4.2.1 General concepts of acid-base balance 4.7) 4.2.2 pH regulation: buffers system 4.8) 4.2.3 pH regulation: respiration and excretion 4.9) 4.2.4 Acid-base imbalance	

4.10) LAB 3 Movement through membranes

5. Urinary System

- 5.1) 5.1 The kidneys
- 5.2) 5.2 Regulation of glomerular filtration
- 5.3) 5.3 Regulation of tubular reabsorption
- 5.4) 5.4 Regulation of tubular secretion
- 5.5) 5.5 Urinary system diseases
- 5.6) LAB 4 Renal Physiology

6. Integrated Cardiovascular System

- 6.1) 6.1 Circulatory pathways
- 6.2) 6.2 Circulatory vessels
- 6.3) 6.3 Heart electrical activity
- 6.4) 6.4 Heart mechanics and the cardiac cycle
- 6.5) 6.5 Cardiac outputs and its control
- 6.6) 6.6 Integrated cardiovascular function
- 6.7) LAB 5 Blood Physiology I: Erythrocytes functions
- 6.8) LAB 6 Blood Physiology II: Leukocytes, blood types and haemostasis

7. Respiratory System

- 7.1) 7.1 Respiratory mechanics in mammals
- 7.2) 7.2 Lung volumes in mammals
- 7.3) 7.3 Gas transport and gas exchange
- 7.4) 7.4 Regulation of respiration
- 7.5) 7.5 Respiratory illnesses and diseases
- 7.6) LAB 7 Respiratory function

8. Digestive System

- 8.1) 8.1 General aspects of digestion
- 8.2) 8.2 Digestive components/compartments
- 8.3) 8.3 Regulation of feeding and digestion
- 8.4) 8.4 Digestive diseases
- 8.5) LAB 8 Digestion

9. Principles of Support and Movement

- 9.1) 9.1 Types and functions of muscles
- 9.2) 9.2 Sliding filament theory and biomechanics
- 9.3) 9.3 Regulation of muscle system
- 9.4) 9.4 Muscular system diseases

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Case Study	n/a	20%	CLO3
	Lab Exercise	Lab activities	5%	CLO2
	Lab Exercise	Commitment and Effort	5%	CLO1
	Test	n/a	20%	CLO3

Reading List	Recommended Text	<ul style="list-style-type: none"> • Moyes CD and Schulte PM 2016, <i>Principles of Animal Physiology</i>, 3rd Edition Ed., Pearson • Stanfield CL 2016, <i>Principles of Human Physiology</i>, 6th Edition Ed., Pearson Education, UK • Marieb EN and Hoehn K 2015, <i>Human Anatomy and Physiology</i>, 10th Edition Ed., Pearson Education, USA • Silverthorn DU 2015, <i>Human Physiology: An Integrated Approach</i>, 7th Edition Ed., Pearson Education, UK
	Reference Book Resources	<ul style="list-style-type: none"> • Sherwood L, Klandorf H and Yancey PH 2013, <i>Animal Physiology: From Genes To Organisms</i>, 2nd Edition Ed., Brooks/Cole CENGAGE Learning • Sherwood L 2015, <i>Human Physiology: From Cells To System</i>, 9th Edition Ed., Brooks/Cole CENGAGE Learning
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	