澳門理工大學
Universidade Politécnica de Macau
Macao Polytechnic University

FACULTY OF HEALTH SCIENCES AND SPORTS
BACHELOR OF SCIENCE IN BIOMEDICAL TECHNOLOGY
(MEDICAL LABORATORY TECHNOLOGY)
LEARNING MODULE OUTLINE

Academic Year	2025-2026	Semester	II	
Module Code	BSPP1102			
Learning Module	Pathophysiology			
Pre-requisite(s)	Nil			
Medium of Instruction	Chinese & English			
Credits	4	Contact Hours	60	
Instructor	Grace, Meng Li Rong	Email	lrmeng@mpu.edu.mo	
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MODULE DESCRIPTION

Pathophysiology emphasizes on discussing the mechanism and law about occurrence, process, prognosis in diseases, which is a science laying particular stress on theory at some extent. Knowledge about normal configuration and function as well as metalolism in human body should be used in pathophysiology by comprehensive analysis to understand disease. So there exists a close relationship between pathophysiology and biology, genetics, anthropotomy, histology, physiology, biochemistry, biophysics, pathology, pharmacology, immunology, microbiology.

This subject helps students master the common mechanisms and nature of disease processes, including the core features of body responses e.g. metabolism. This study offers rationales for devising prevention and treatment of diseases.

MODULE INTENDED LEARNING OUTCOMES (ILOS)

On completion of this learning module, students will be able to:

M1.	Medical students in basic pathophysiology courses will find that this subject makes a useful contribution to their understanding of how disordered physiology produces common diseases and syndromes.
M2.	The students will understand a general ideas about diseases
M3.	The students will comprehend how and why the symptoms and signs of various disease states appear.
M4.	The fundamental pathologic progresses or typical pathologic progresses.

These ILOs aims to enable students to attain the following Programme Intended Learning Outcomes (PILOs):

PILOs	M1	M2	M3	M4
P1. To demonstrate understanding of a range of subjects, fields, principles and approaches relevant to medical laboratory technology	✓	✓	✓	✓
P2. To demonstrate understanding of theories, analytical approaches and practices that underpin medical laboratory operations and management	✓	✓	✓	✓
P3. To demonstrate understanding of major trends and issues related to medical laboratory technology	✓	✓	✓	✓
P4. To apply professional knowledge and skills to analyse, interpret and solve problems, challenges and risks in medical laboratory practice	✓	✓	✓	✓
P5. To critically appraise and interpret scientific and clinical literature and apply evidence-based practice	✓	✓	✓	✓
P6. To acquire and apply research skills in medical laboratory technology	✓	✓	✓	✓
P7. To demonstrate effective communication and teamwork skills	✓	✓	✓	✓
P8. To maintain professional and ethical standards in medical laboratory practice and research	✓	✓	✓	✓

MODULE SCHEDULE, COVERAGE AND STUDY LOAD

Week	Content Coverage	Contact Hours

1	1. Introduction (2 class hours)
	  1.1 Concept of disease
	  1.2 Disease etiology, pathogenesis and outcome
	  1.3 Prevention of disease
	
	2. Disorders of water and electrolyte metabolism (6 class hours)
	  2.1 Disorders of water and sodium metabolism
	  2.2 Disorders of Potassium metabolism
	  2.3 Disorders of magnesium metabolism
	  2.4 Disorders of Calcium and Phosphorus metabolism
	  2.5 Edema
	  2.6 Case analysis
		8

2	3. Acid-base disturbances (4 class hours)
	  3.1 Generation of acids and bases
	  3.2 Regulation of pH
	  3.3 Simple acid-base disorders
	  3.4 Mixed acid-base disorders
	  3.5 Case analysis
	
	4. Hypoxia (4 class hours)
	  4.1 Parameters of blood oxygen
	  4.2 Classification, etiology and pathogenesis of hypoxia
	  4.3 Alterations of function and metabolism
	  4.4 Oxygen therapy and oxygen intoxication
	  4.5 Case analysis
		8

3	5. Fever (4 class hours)	6

	5.1 Regulation of normal body temperature
	5.2 Etiology and Pathogenesis
	5.3 Alterations of function and metabolism
	5.4 Pathophysiological basis of prevention and treatment
	5.5 Case analysis
	
	6. Cellular signal transduction and disease (2 class hours)
	    6.1 Major pathways for cell signalling
	    6.2 Dysfunction of cell signalling in diseases
	    6.3 Pathophysiological basis of prevention and treatment
	    6.4 Case analysis	

4	7. Apoptosis and disease (2 class hours)
	    7.1 Inducer of apoptosis
	    7.2 Effectors and regulators of apoptosis
	    7.3 The biochemical pathways in apoptosis
	    7.4 Abnormal cell apoptosis in diseases
	    7.5 Case analysis
	
	8. Stress (2 class hours)
	    8.1 Terminology of stress
	    8.2 Stress responses
	    8.3 Functional and metabolic responses
	    8.4 Stress-related diseases
	    8.5 Pathophysiological basis of prevention and treatment for stress disorders
	    8.6 Case analysis
	
	9. Disseminated intravascular coagulation (4 class hours)
	    9.1 Etiology and Pathogenesis
	    9.2 Factors influencing the development of DIC
	    9.3 Clinical classification of DIC
	    9.4 Alterations of function and metabolism
	    9.5 Pathophysiological basis of prevention and treatment
		8

5	10. Ischemia-reperfusion injury (2 class hours)
	    10.1 Etiology and Pathogenesis
	    10.2 Alterations of function and metabolism during ischemia-reperfusion injury
	    10.3 Pathophysiological basis of prevention and treatment for ischemia-reperfusion injury
	    10.4 Case analysis
	
	11. Shock (4 class hours)
	    11.1 Etiology, pathogenesis and classification
	    11.2 Alterations of function and metabolism
	    11.3 Pathophysiological basis of shock prevention and treatment
	    11.4 Multiple organs dysfunction syndrome (MODS)
	    11.5 Case analysis
		6

6	12. Respiratory insufficiency (4 class hours)	8

	12.1 Etiology and pathogenesis
	12.2 Acute respiratory failure and chronic respiratory failure
	12.3 Alterations of function and metabolism
	12.4 Pathophysiological basis of prevention and treatment
	12.5 Case analysis
	
	13. Cardiac insufficiency (4 class hours)
	    13.1 Etiology
	    13.2 Classification and pathgenesis
	    13.3 Compensatory and adaptive response
	    13.4 Alterations of function and metabolism
	    13.5 Pathophysiological basis of prevention and treatment
	    13.6 Case analysis	

7	14. 14. Hepatic insufficiency (4 class hours)
	    14.1 Etiology and pathogenesis for hepatic insufficiency
	    14.2 Hepatic encephalopathy
	    14.3 Hepatorenal syndrome
	    14.4 Case analysis
	
	15. Renal insufficiency (4 class hours)
	    15.1 Basic tache of pathogenesis for renal insufficiency
	    15.2 Acute and chronic renal failure
	    15.3 Uremia
	    15.4 Pathophysiological basis of prevention and treatment for CRF and uremia
	    15.5 Case analysis
		8

8	16. Middle term test (2 class hours) 17. Review (4 class hours) 18. Final Exam (2 class hours)	8

TEACHING AND LEARNING ACTIVITIES

In this learning module, students will work towards attaining the ILOs through the following teaching and learning activities:

Teaching and Learning Activities	M1	M2	M3	M4
T1. Lectures and videos	✓	✓	✓	✓
T2. Case study	✓	✓	✓	✓
T3. Group discussion	✓	✓	✓	✓

Attendance requirements are governed by the Academic Regulations Governing Bachelor's Degree Programmes of the Macao Polytechnic University. Students who do not meet the attendance requirements for the learning module shall be awarded an 'F' grade.

ASSESSMENT

In this learning module, students are required to complete the following assessment activities:

Assessment Activities	Weighting (%)	ILOs to be Assessed
A1. Mid-term Test	40%	M1-M4
A2. Final Exam	60%	M1-M4

This learning module is graded on a 100 point scale, with 100 being the highest possible score and 50 being the passing score.

Any students scoring less than 35% of the total mark in the final examination will be given an "F" grade for the module even if the overall grade is 50% or higher.

Make-up assessments will not be provided for the mid-term test under any circumstances. Students who are absent will receive a score of zero for that assessment.

The assessment will be conducted following the University's Assessment Strategy (see www.mpu.edu.mo/teaching_learning/en/assessment_strategy.php). Passing this learning module indicates that students will have attained the ILOs of this learning module and thus acquired its credits.

MARKING SCHEME

Marks Ranges	Grade	Grade Point	Grade Definitions**
93–100 88 – 92	A A-	4.0 3.7	Excellent
83 – 87	B+	3.3	Very Good
78–82 73 – 77	B B-	3.0 2.7	Good
68–72 63–67 58 – 62	C+ C C-	2.3 2.0 1.7	Satisfactory
53 – 57 50 – 52	D+ D	1.3 1.0	Passed
0 – 49	F	0	Failed

REQUIRED READINGS

王建枝、金惠銘（編）（2005）*Pathophysiology*（第 1 版）。北京：人民衛生。

金惠銘、王建枝（編）（2018）*病理生理學*（第 9 版）。北京：人民衛生。

Yao Tai.(2008). Textbook of Physiology. Beijin: People's Medical Publishing House.

REFERENCES

McPhee , S. J., Lingappa, V. R., & Ganong, W. F. (2004). *Pathophysiology of disease.*(3rd ed.). New York: McGraw-Hill.

謝可鳴，王小川. 病理生理學復習與自測. (2008). 北京：人民衛生出版社

STUDENT FEEDBACK

At the end of every semester, students are invited to provide feedback on the learning module and the teaching arrangement through questionnaires. Your feedback is valuable for instructors to enhance the module and its delivery for future students. The instructor and programme coordinators will consider all feedback and respond with actions formally in the annual programme review.

ACADEMIC INTEGRITY

The Macao Polytechnic University requires students to have full commitment to academic integrity when engaging in research and academic activities. Violations of academic integrity, which include but are not limited to plagiarism, collusion, fabrication or falsification, repeated use of assignments and cheating in examinations, are considered as serious academic offenses and may lead to disciplinary actions. Students should read the relevant regulations and guidelines in the Student Handbook which is distributed upon the admission into the University, a copy of which can also be found at www.mpu.edu.mo/student_handbook/.