

# Macao Polytechnic Institute

## School of Health Sciences and Sports

### Bachelor of Science in Biomedical Technology (Medical Laboratory Technology and Pharmacy Technology)

#### Module Outline

Academic Year 2021 / 2022 Semester 1

|                              |   |                           |                   |                    |       |
|------------------------------|---|---------------------------|-------------------|--------------------|-------|
| <b>Learning Module</b>       | Anatomy And Physiology                  |                           | <b>Class Code</b> | BSAP1101           |       |
| <b>Pre-requisite(s)</b>      | Nil                                     |                           |                   |                    |       |
| <b>Medium of Instruction</b> | Chinese & English                       |                           | <b>Credit</b>     | 4                  |       |
| <b>Lecture Hours</b>         | 60hrs                                   | <b>Lab/Practice Hours</b> | Nil               | <b>Total Hours</b> | 60hrs |
| <b>Instructor</b>            | Grace, Meng Li Rong                     |                           | <b>E-mail</b>     | lrmeng@ipm.edu.mo  |       |
| <b>Office</b>                | M730, Meng Tak Building,<br>Main Campus |                           | <b>Telephone</b>  | 85993449           |       |

#### Description

This 60-hour learning module of human anatomy and physiology is a fundamental element in the biomedical technology program (including medical laboratory technology and pharmacy technology). Students would learn the basic concepts of the gross morphology and spatial interrelations of the structures and functions of the human body. With this background, the student would be able to go into study of all other essential subjects including pathophysiology, pharmacology, and health assessment. Such study is also essential for the students to plan appropriate intervention for the client with health problems, perform appropriate skills for maintaining health and promote comfort for the client, and give health teaching.

#### Learning Outcomes

At the end of this subject, the students are expected to master the basic knowledge of human anatomy and physiology, and to apply such knowledge in other subjects in the program and practice.

## **Content**

1. General introduction (2 class hours)
  - 1.1 General description to human body
  - 1.2 The cells, tissues and organisation of the body
  - 1.3 Physiology of the cells
    - 1.31 Transport across cell membranes
    - 1.32 Intercellular communication
    - 1.33 Electrical phenomena of the nerve cells
    - 1.34 Contraction of the skeletal muscle
  - 1.4 Regulation of body functions
  
2. Locomotor system (4 class hours)
  - 2.1 Osteology
  - 2.2 Arthrology
  - 2.3 Myology
  
3. Blood (4 class hours)
  - 3.1 The composition of blood
  - 3.2 Hemostasis
  - 3.3 Blood types
  
4. Cardiovascular system (6 class hours)
  - 4.1 Structure of cardiovascular system
    - 4.11 General description
    - 4.12 Heart
    - 4.13 Arteries
    - 4.14 Veins
    - 4.15 Lymph
  - 4.2 Function of cardiovascular system
    - 4.21 electrical properties of the cardiac muscle
    - 4.22 The electrocardiogram
    - 4.23 The heart as a pump
    - 4.24 Dynamics of blood and lymph flow
    - 4.25 Cardiovascular regulatory mechanisms
    - 4.26 Circulation through special regions
    - 4.27 Cardiovascular homeostasis in health and disease
  
5. Digestive system (6 class hours)
  - 5.1 Structure of digestive system
    - 5.11 General description

- 5.12 Oral cavity / Pharynx / Esophagus / Stomach / Small intestine / Large intestine / Liver / Pancreas
- 5.2 Function of digestive system
  - 5.21 Functional anatomy of the Gastrointestinal tract
  - 5.22 Mouth and esophagus
  - 5.23 Digestion in stomach
  - 5.24 Digestion in small intestine
  - 5.25 Absorption in the small intestine
  - 5.26 Function of the colon
- 6. Respiration system (6 class hours)
  - 6.1 Structure of respiration system
    - 6.11 General description
    - 6.12 Nose / Larynx / Trachea and bronchi / Lungs / Pleura / Mediastinum
  - 6.2 Function of respiration system
    - 6.21 Pulmonary function
    - 6.22 Gas exchange in the lungs
    - 6.23 Gas transport between the lungs and tissues
    - 6.24 Regulation of respiration
    - 6.25 Respiratory adjustments in health and disease
- 7. Urinary System (4 class hours)
  - 7.1 Structure of urinary system
    - 7.11 General description
    - 7.12 Kidneys / Ureters / Urinary bladder / Urethra
  - 7.2 Function of urinary system
    - 7.21 Functional anatomy of kidney
    - 7.22 Glomerular filtration
    - 7.23 Tubular reabsorption and secretion
    - 7.24 Regulation of urine formation
    - 7.25 Micturition
- 8. Nervous system (6 class hours)
  - 8.1 Structure of nervous system
    - 8.11 General description
    - 8.12 Spinal nerves
    - 8.13 Cranial nerves
    - 8.14 Autonomic nervous system
    - 8.15 Meninges of brain and spinal Cord
    - 8.16 Blood vessels of brain and spinal Cord

8.17 Blood-brain barrier

8.2 Function of nervous system

8.21 Nerve cells and neuroglia

8.22 Synaptic transmission

8.23 Reflexes

8.24 Sensory functions of the nervous system

8.25 Control of posture and movement

8.26 Central regulation of visceral function

8.27 Neural basis of instinctual behaviour and emotions

8.28 Electrical activity of the brain, sleep and wakefulness

8.29 Higher functions of the nervous system

9. Reproductive System (4 class hours)

9.1 Male reproductive system

9.11 Internal reproductive organs

9.12 External reproductive organs

9.13 Male urethra

9.14 Function of male reproductive system

9.2 Female reproductive system

9.21 Internal reproductive organs

9.22 External reproductive organs

9.23 Appendix: mamma / perineum

9.24 Function of female reproductive system

10. Sensory Organs (4 class hours)

10.1 Structure of sensory organs

10.11 General description

10.12 Visual organ: eyeball / accessory organs of eye / blood vessels and nerves of eye

10.13 Vestibulocochlear organ: external ear / middle ear / internal ear / conduction of sound waves

10.2 Function of sensory organs

10.21 Initiation of impulses in sense organs

10.22 Vision

10.23 Hearing

10.24 Vestibular function

10.25 Smell and taste

11. Endocrine system (4 class hours)

11.1 Structure of endocrine system

11.11 General description

- 11.12 Hypophysis / thyroid gland / parathyroid glands /suprarenal glands /pineal body / pancreatic islets / thymus / gonads
- 11.2 Function of endocrine system
  - 11.21 The hypothalamo-hypophysial system
  - 11.22 The thyroid gland
  - 11.23 The parathyroid glands and other calcium metabolism-related hormones
  - 11.24 The adrenal glands
  - 11.25 Endocrine functions of the pancreas
  - 11.26 Endocrine functions of other organs and tissues
- 12. Energy metabolism and body temperature (2 class hours)
  - 12.1 Energy metabolism
  - 12.2 Body temperature
- 13. Review (2 class hours)
- 14. Group Presentatioo (4 class hours)
- 15. Examination (2 class hours)

### **Teaching Method**

Lectures, videos, case study and group discussion.

### **Attendance**

Attendance requirements are governed by the “Academic Regulations Governing Bachelor’s degree programmes of Macao Polytechnic Institute”. Students are not eligible to attend the final examination and re-sit examination, moreover, an “F” will be given as the final grade to students who have less than the stated attendance for the enrolled learning module.

### **Assessment**

This learning module is graded on a 100 point scale, with 100 being the highest possible score and 50 the pass score. Any students scoring less than 35% of the total mark in the final examination will be given an “F” grade for the learning module even if the overall grade is 50% or higher.

|    | <b>Item</b>   | <b>Description</b>       | <b>Percentage</b> |
|----|---------------|--------------------------|-------------------|
| 1. | Mid-term Test | Closed book test         | 40 %              |
| 2. | Final Exam    | Closed book examination  | 60 %              |
|    |               | <b>Total Percentage:</b> | 100 %             |

## **Teaching Material(s)**

### **Textbooks**

柏樹令 (2018)。 *系統解剖學* (第九版)。北京：人民衛生。

Bai Shuling.(2007). *Textbook of Anatomy*. Beijin: People's Medical Publishing House.

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

### **Referene Books**

朱大年 (2013)。 *生理學* (第八版)。北京：人民衛生。

Alcamo, E. (2004). *Anatomy and Physiology* (2<sup>nd</sup> ed.).

郭光文 (編) (2000)。 *人體解剖彩色圖譜*。北京：人民衛生。