



**FACULTY OF HEALTH SCIENCES AND SPORTS**  
**BACHELOR OF SCIENCE IN BIOMEDICAL TECHNOLOGY**  
**(MEDICAL LABORATORY TECHNOLOGY)**

**LEARNING MODULE OUTLINE**

Academic Year	2023-2024	Semester	2
Module Code	BSPE1101-221		
Learning Module	Clinical Nutrition		
Pre-requisite(s)	Nil		
Medium of Instruction	Chinese & English		
Credits	2	Contact Hours	30
Instructor	Lang Bin	Email	blang@mpu.edu.mo
Office	M717	Office Phone	85993440

**MODULE DESCRIPTION**

This 30-hour subject is one of the foundation subjects of the biomedical technology program. It will introduce basic concepts of human nutrition and relate these concepts to health and illness. It also includes the knowledge of the major functions and metabolism of macronutrients and micronutrients in order to help students understand the association among nutrition, health and illness, as well as assessment of nutritional status.

**MODULE INTENDED LEARNING OUTCOMES (ILOS)**

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

M1.	Master terminology used in nutrition.
M2.	Describe the major nutritional status assessments.
M3.	Explain the major nutrients physiological functions, absorption, utilization and deficiency.
M4.	Explain the process of nutritional assessment for identifying people at risk of becoming malnourished.
M5.	Describe the therapeutic diets commonly used in hospitals.



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

PILOs	M1	M2	M3	M4	M5
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 to nutrition (2 class hours) 1.1 The Science of Nutrition 1.2 Terminology in Nutrition 1.3 The Nutrients 1.4 Dietary Reference Intakes 1.5 Food Guide Pyramid 1.6 Nutrition Assessment	2
2	2. Carbohydrates (2 class hours) 2.1 Definition of carbohydrates 2.2 Classification of carbohydrates 2.3 Digestion & absorption of carbohydrates 2.4 Functions of carbohydrates 2.5 Disorders related to carbohydrates metabolism 2.6 Dietary reference intakes of carbohydrates	2
3	3. Protein (2 class hours) 3.1 History of protein 3.2 Essential Amino Acid 3.3 Protein's function 3.4 Digestion, absorption and metabolism of protein 3.5 Evaluation the nutrition value of food protein 3.6 Dietary protein deficiency 3.7 Assessment of nutritional status 3.8 Dietary reference intakes and food source of protein	2



Week	Content Coverage	Contact Hours
3	<p>4. Vitamins (2 class hours)</p> <p>4.1 Introduction of Vitamins</p> <p>4.11 History of Vitamins</p> <p>4.12 Characteristics</p> <p>4.13 Name</p> <p>4.14 Classification</p> <p>4.2 The Fat Soluble Vitamins: A, D, E, and K</p> <p>4.21 Functions</p> <p>4.22 Digestion, absorption and metabolism</p> <p>4.23 Deficiency and Toxicity</p> <p>4.24 Estimation of nutritional level</p> <p>4.25 Dietary reference intakes and food source</p> <p>4.3 The Water Soluble Vitamins: B Vitamins and Vitamin C</p> <p>4.31 Functions</p> <p>4.32 Digestion, absorption and metabolism</p> <p>4.33 Deficiency and Toxicity</p> <p>4.34 Estimation of nutritional level</p> <p>4.35 Dietary reference intakes and food source</p>	2
4	<p>5. Lipids (2 class hours)</p> <p>5.1 Introduction of lipids</p> <p>5.2 Classification of triglycerides</p> <p>5.3 <math>\omega</math>-3 and <math>\omega</math>-6 fatty acids</p> <p>5.4 Lipids digestion and absorption</p> <p>5.5 Functions of lipids</p> <p>5.6 Disadvantages of lipids</p> <p>5.7 Nutritional assessment of dietary lipids</p> <p>5.8 Dietary reference intakes and food source of lipids</p>	2
4	<p>6. Minerals (2 class hours)</p> <p>6.1 Introduction of minerals: Calcium, Iron, Zinc, Iodine, Selenium, other</p> <p>6.2 Roles and Functions in the Body</p> <p>6.3 Absorption and Metabolism</p> <p>6.4 Deficiency and Toxicity</p> <p>6.5 Nutritional evaluation</p> <p>6.6 Dietary reference intakes and food source</p> <p>6.7 Supplementation</p>	2
5	<p>7. Nutrition and dietary requirements for specific populations (4 class hours)</p> <p>7.1 Life Cycle Nutrition: Pregnancy and Lactation</p> <p>7.11 Physiological changes in pregnancy and lactation</p> <p>7.12 Nutrient requirements of pregnancy and lactation</p> <p>7.13 Influence of maternal nutritional status on fetus and infants</p> <p>7.14 Rational diet during pregnancy and lactation</p> <p>7.2 Nutrition and dietary of Infancy, Childhood, and Adolescence</p> <p>7.3 Nutrition and dietary of Adulthood and the Later Years</p>	4



Week	Content Coverage	Contact Hours
5	8. Nutrition and Diet-related disease (6 class hours) 8.1 Nutrition and obesity 8.11 Definition, diagnosis and categorization of obesity 8.12 Causal mechanism and influential factor of obesity 8.13 Health Risks of obesity 8.14 Prevention and treatment of obesity 8.2 Nutrition and coronary atherosclerosis 8.3 Nutrition and hypertension 8.4 Nutrition and diabetes mellitus 8.5 Nutrition and gout 8.6 Nutrition and immune system disease 8.7 Nutrition and Cancer	6
6	9. Nutritional Care (2 class hours) 9.1 Goals of Nutritional Care 9.2 Nutritional assessment and hospital diets 9.3 Nutritional support 9.4 Enteral nutrition 9.5 Parenteral nutrition	2
7	10. Presentation (3 class hours) Review (1 class hours)	4
8	11. Examination (2 class hours)	2

### 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	M5
T1. Lecture	✓	✓	✓	✓	✓
T2. Discussion		✓		✓	✓
T3. Writing assignment				✓	✓
T4. Multimedia resources (videos, podcasts, or online resources)		✓		✓	✓
T5. Oral Presentation					✓

### ATTENDANCE

Attendance requirements are governed by the Academic Regulations Governing [Doctoral/Master's/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. Presentations and individual assignment	40	M1, M2, M4, M5
A2. Final Examination	60	M3, M4, M5

**CLASS PRACTICE** (4 class hours)

Date & Time	Practice Item	Title	Students / Group	Mode of Practice	Requirement
2024/04/23	Presentation and discuss	Diet-related disease	5-6 students per group	Oral presentation	Power-point of the subject issue should be submitted before the presentation for assessment.

The assessment will be conducted following the University's Assessment Strategy (see [www.mpu.edu.mo/teaching\\_learning/en/assessment\\_strategy.php](http://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.

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

Any student 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.

**MARKING SCHEME**

High grades will be awarded to work that demonstrates exceptional understanding and mastery of the subject matter and consistently exceeding expectations. The followings are the general assessment criteria for the assessment activities.

Assessment Activities	Assessment Criteria	Mark Ranges				
		88-100	73-87	58-72	50-57	<50
A1. Group assignment	Describe clearly the background of the assignment; Rational analysis and explanation; Deep reflection; Complete and clear data;	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels
A2. Test	Demonstrate the ability to identify and apply appropriate concepts, methods, and techniques	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels
A3. Final Examination		Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels



Please refer to the 'Essay Rubric.pdf' and 'Group Presentation Evaluation Form.pdf' for the grading criteria of the writing assignment and oral presentation.

### REQUIRED READINGS

周芸（2022）*臨床營養學*（第5版）。北京：人民衛生。

### REFERENCES

郭順堂（2020）*現代營養學*（第九版）。北京：中國輕工業出版社。

Maban, L. K., & Escott-Stump, S. (2011). *Krause's food, nutrition & diet therapy* (9<sup>th</sup> ed.). Philadelphia: Saunders.

Stanfield, P. S. & Hui, Y. H. (2009). *Nutrition and diet therapy* (5<sup>th</sup> ed.). London: Jones & Barlett.

### 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/](http://www.mpu.edu.mo/student_handbook/).