FACULTY OF HEALTH SCIENCES AND SPORTS

BACHELOR OF SCIENCE IN BIOMEDICAL TECHNOLOGY

LEARNING MODULE OUTLINE

Academic Year	2025-2026	Semester	2
Module Code	BSPH3102		
Learning Module	Public Health Analysis (Microbiology)		
Pre-requisite(s)	BSMB1102 Microbiology		
Medium of Instruction	Chinese & English		
Credits	4	Contact Hours	60
Instructor	Lei Iun Fan, Miriam	Email	iflei@mpu.edu.mo
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MODULE DESCRIPTION

This subject covers laboratory analysis technology in environmental samples, include food, water and air quality in microbiological pollution. It introduces the significance of food and water quality to public health when using in different ways. The quality monitoring and analysis methods will be discussed. Theories mentioned in lectures will be explored further in laboratory exercises. Emphasis is placed on the analytical procedures, quality standards, and result interpretation.

MODULE INTENDED LEARNING OUTCOMES (ILOS)

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

M1.	Understand the role and impact of potential environmental contaminants on the safety of food and water.
M2.	Explain the common causes of foodborne illnesses, waterborne diseases, and food spoilage and evaluate their threat to public health;
M3.	Able to identify and explain the key characteristics of microorganisms associated with foodborne illnesses, waterborne diseases, and food spoilage.
M4.	Employ standard methods and protocols for isolating, detecting, and identifying microorganisms in food, water, and spoiled food samples.
M5.	Able to analyze and interpret the results obtained from microbiological analysis of food and water samples.
M6.	Demonstrate effective and responsible individual and group work in the field of food and water microbiology.

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

PILOs	M1	M2	M3	M4	M5	M6
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	00 - Subject outline	1
1,2	01 - Introduction (Food)	5
2	02 - Introduction (Water)	2
4	03 - Total count & Yeast & Mold count	6
5	04 - Coliforms & E coli (1) (2)	6
6	Lab 1 Quantitation tests for Food Sample	4
7	Lab 2 Quantitation tests for Water Sample and Air sample	4
8	05 - Staphylococcus	2
8	06 – Bacillus cereus	2
9	07 - Pseudomonas aeruginosa	2
9	08 - Enterococcus	2
10	09 - Legionella	2
10	10 – Clostridium perfringens	2

11	11 – Vibrio parahaemolyticus & Vibrio vulnificus	2
11	12 – Vibrio cholerae	2
12	13 – Listeria monocytogenes	2
12	14 – Salmonella spp	3
13	15 – E. coli O157	2
13	16 – Staphylococcal Enterotoxin	1
14	Lab 3 Salmonella serotyping	4
8	Mid-term exam (2 hr)	2
15	Final exam (2 hr)	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**	**M6**
T1. Lectures	✓	✓	✓	✓	✓	✓
T2. Video and animation	✓	✓	✓			
T3. Classroom activities		✓	✓	✓	✓	✓
T4. Lab practices and reports			✓	✓	✓	
T5. Mid and Final exam	✓	✓	✓	✓	✓	

ATTENDANCE

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. Classroom activities	10	M2, M3, M4, M5, M6
A2. Lab practices and report	20	M3, M4, M5
A3. Midterm exam	30	M1, M2, M3, M4, M5
A4. Final exam	40	M1, M2, M3, M4, M5

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

Make-up assessments will not be provided for the classroom activities, exam and lab practice under any circumstances. Students who are absent will receive a score of zero for that assessment.

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.

Passing this learning module indicates that students will have attained the ILOs of this learning module and thus acquired its credits.

MARKING SCHEME

Assessment Activities	Assessment Criteria	Mark Ranges				
		88-100	73-87	58-72	50-57	<50
A1. Classroom learning activities	Demonstrate the understanding of the subjects covered in classes and show active learning attitude.	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels
A2. Assignments	Demonstrate the ability to answer questions on topics covered in the outline	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels
A3. Prelab quiz	Demonstrate the ability to understand the principles and procedures of experiments	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels
A4. Lab practices	Master relevant experimental skills or operations, data handling and lab report etc.	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels
A5. Midterm and final examination	Demonstrate the ability to identify and apply appropriate concepts, methods and techniques	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels

REQUIRED READINGS

Food & Drug Administration 8a ed. Bacteriological Analytical Manual available online at: http://www.fda.gov/Food/FoodScienceResearch/LaboratoryMethods/ucm2006949.htm

E.W. Rice, R.B. Baird, (2022) Standard methods for the examination of water and wastewater 24th edition American Public Health Association, American Water Works Association, Water Environment Federation

REFERENCES

1. 中華人民共和國國家標準 GB/T 4789 (2016) 中華人民共和國衛生部 中國國家管理委員會發佈
2. Neusely da Silva, Marta Hirotomi Taniwaki, et al. (2019) Microbiological examination methods of food and water: A Laboratory Manual. 2nd edition CRC Press
3. Yvonne Salfinger, Mary Lou Tortorello (2015) Compendium of methods for the microbiological examination of food 5th edition. American Public Health Association

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/.