

# Macao Polytechnic Institute

## School of Health Sciences and Sports

### Bachelor of Science in Biomedical Technology

#### (Medical Laboratory & Pharmacy Technology)

#### Module Outline

Academic Year 2020 / 2021 Semester 2

<b>Learning Module</b>	Microbiology		<b>Class Code</b>	BSMB1102	
<b>Pre-requisite(s)</b>	Nil				
<b>Medium of Instruction</b>	Chinese, English		<b>Credit</b>	4	
<b>Lecture Hours</b>	40 hrs	<b>Lab/Practice Hours</b>	20 hrs	<b>Total Hours</b>	60 hrs
<b>Instructor</b>	Ye Qianhong, Ivy, Ng Hoi Man		<b>E-mail</b>	yeqianhong@ipm.edu.mo	
<b>Office</b>	Rm.709A, Meng Tak Building, Main Campus		<b>Telephone</b>	85993433	

#### Description

This 60-hour module is one of the foundation modules of the biomedical sciences program. It will introduce basic concepts of microbiology and basic micro-organism analysis techniques. This course utilizes the theoretical approach to the study of microorganisms and offers the student a comprehensive knowledge of the fundamentals of microbiology. It includes an introduction to and history of microbiology, classifications and physiology (nutrition and metabolism, growth, variability, etc); laboratory techniques and methods of handling microorganisms. It includes 40 lecture hours and 20 practical hours.

#### Learning Outcomes

After completing this learning module, students are able to:

1. master the fundamental characteristics and types of microorganisms, with an emphasis on health applications.
2. understand the physiology, growth, reproduction and genetics of microorganisms.
3. understand the processes through which microorganisms, including bacteria, viruses, fungi, protozoa and parasites cause key infectious diseases.
4. master basic microorganism analysis techniques including microscopy, culture, aseptic techniques and microbiology laboratory safety.

## **Content**

1. Characteristics of various kinds of microorganism and parasite ( 22 hours )
  - 1.1 Introduction to microbiology (comprehend) ( 2 hours )
  - 1.2 Bacteriology I: introduction, type, structure (master) ( 4 hours )
  - 1.3 Bacteriology II: growth, cell division, microbial genetics (master) ( 4 hours )
  - 1.4 Basic virology I: structure (master) ( 2 hours )
  - 1.5 Basic virology II: replication genetics & mutation; medically important viruses (master) ( 2 hours )
  - 1.6 Mycology and other organism I (master) ( 2 hours )
  - 1.7 Mycology and other organism II (master) ( 2 hours )
  - 1.8 Parasitology I: helminths (master) ( 2 hours )
  - 1.9 Parasitology II: protozoa, arthropods (master) ( 2 hours )
2. Biological reciprocity ( 2 hours )
  - 2.1. Normal flora (master)
  - 2.2. Interaction with other organisms (comprehend)
3. Infection and immunity ( 2 hours )
  - 3.1. Microbial pathogenesis (master)
  - 3.2. Host defenses (master)
  - 3.3. Types of infection (comprehend)
4. Common infections (4 hours)
  - 4.1. Respiratory tract infection: trachoma, pharyngitis, diphtheria, whooping cough, common cold, influenza, tuberculosis, pneumonia (comprehend)
  - 4.2. Gastroenteritis, typhus, dysentery, cholera, intestinal tract parasitic disease (comprehend)
  - 4.3. Urinary tract and reproductive systems infection: urethritis, cystitis, and ureteritis, pyelonephritis; sexually transmitted diseases, (comprehend)
5. Infection prevention (2 hours)
  - 5.1. disinfection and sterilization (master)
  - 5.2. hospital acquired infections (comprehend)
6. Medical microbiology technique (4 hours)
  - 6.1 Aseptic technique (master)
  - 6.2 Microbiology media preparation (master)
  - 6.3 Aseptic transfer of bacterial cultures (master)
  - 6.4 Microscope slide techniques (master)
7. Experiment (20 hours)
  - 7.1. Microbiology media preparation
  - 7.2. Aseptic transfer of bacterial cultures
  - 7.3 Microscope slide techniques
  - 7.4. Gram staining
  - 7.5. Lab exam
8. Test, final exam (4 hours)

## **Teaching Method**

Lectures, videos, case studies

## **Attendance**

Attendance requirements are governed by the “Academic Regulations Governing Bachelor’s Degree Programmes of Macao Polytechnic Institute”. Students who do not meet the attendance requirements for the learning module will not be permitted to sit the final / re-sit examination and shall be awarded an ‘F’ grade.

## **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.	Experiment examination		20%
2.	Laboratory report		10 %
3.	Test	Lecture 1- Lecture 5	20%
4.	Final examination	All classes	50 %
		<b>Total Percentage:</b>	100 %

## **Teaching Material(s)**

- 1.Gerard J. Tortora, Berdell R. Funke, Christine L. Case.(2014). Microbiology : An Introduction 12th, Prentice Hall PTR.
- 2.Alfred E. Brown. (2012). Benson's Microbiological Applications (Laboratory Manual in General Microbiology Complete Version), Twelfth Edition. McGraw-Hill Companies,Inc.
- 3.Ryan, R. J., Ray, C. G., & Brooks, G.F. (2006). Textbook of medical microbiology and parasitology. Beijing, Science Press.

## **Reference**

1. 李凡，醫學微生物學，第七版，全國高等學校教材(供基礎、臨床、預防、口腔醫學類專業用)。人民衛生出版社。

## Timetable

Session	Date	Time	Topic	Teacher
1	2021-01-21	16:30-18:30	Introduction to medical microbiology	Wu xuwen
2	2021-01-26	16:30-18:30	Structure of bacterial cells(1)	Wu xuwen
3	2021-01-28	16:30-18:30	Structure of bacterial cells(2)	Wu xuwen
4	2021-02-04	16:30-18:30	Nutrition and Growth	Wu xuwen
5	2021-02-02	16:30-18:30	Bacterial genetics and Mutation	Wu xuwen
6	2021-02-23	16:30-18:30	Classification and Identification	Wu xuwen
7	2021-02-25	16:30-18:30	Normal flora Pathogenesis and Immunity & Vaccine	Wu xuwen
8	2021-03-02	16:30-18:30	Sterilization and Disinfection	Wu xuwen
9	2021-03-04	16:30-18:30	Basic virology	Wu xuwen
10	2021-03-09	16:30-18:30	Mycology and Other organism ( 1 )	Wu xuwen
11	2021-03-11	16:30-18:30	Mycology and Other organism ( 2 )	Wu xuwen
12	2021-03-16	16:30-18:30	Test	Wu xuwen
13	2021-03-18	16:30-18:30	Parasitology ( 1 )	Wu xuwen
14	2021-03-23	16:30-18:30	Parasitology ( 2 )	Wu xuwen
15	2021-03-25	16:30-18:30	Microbial diseases ( 1 )	Wu xuwen
16	2021-03-30	14:30-17:30	Microbial diseases ( 2 )	Wu xuwen
17	2021-04-05	14:30-17:30	Medical microbiology techniques ( 1 )	Ye qianhong
18	2021-04-09	16:30-18:30	Medical microbiology techniques ( 2 )	Ye qianhong
19	2021-04-20	14:30-16:30	Experiment ( 1 )	Ye qianhong
20	2021-04-20	16:30-18:30	Experiment ( 2 )	Ye qianhong
21	2021-04-20	18:30-20:30	Experiment ( 3 )	Ye qianhong
22	2021-04-21	14:30-16:30	Experiment ( 4 )	Ye qianhong
23	2021-04-21	16:30-18:30	Experiment ( 5 )	Ye qianhong
24	2021-04-21	18:30-20:30	Experiment ( 6 )	Ye qianhong
25	2021-04-22	14:30-16:30	Experiment ( 7 )	Ye qianhong
26	2021-04-22	16:30-18:30	Experiment ( 8 )	Ye qianhong
27	2021-04-26	14:30-15:30	Experiment ( 9 )	Ye qianhong
28	2021-04-27	14:30-17:30	Experiment ( 10 )	Ye qianhong
29	2021-05-18	14:30-16:30	EXAM	Wu xuwen