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	2024 / 2025	Semester	2
Module Code	BSBB3102		
Learning Module	Immunohematology (Blood Banking)		
Pre-requisite(s)	Nil		
Medium of Instruction	Chinese and English		
Credits	2	Contact Hours	30
Instructor	Mr Wan Chi Chung Ms U Nga Man	Email	T1696@mpu.edu.mo T1619@mpu.edu.mo
Office	N.A.	Office Phone	85993454

MODULE DESCRIPTION

Immunohematology is a specialized branch of laboratory medicine, which provides the study of the basic principles of immunology, human blood group systems, the theory and application of blood banking techniques. The topics to be covered include: preparation of blood component, routine blood banking procedures including blood grouping, antibody screening, antibody identification and crossmatching, hemolytic disease of the newborn and adverse complications of transfusion. The course is 2 credits, 30 hours, includes 20 lecture hours and 10 practical hours.

MODULE INTENDED LEARNING OUTCOMES (ILOS)

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

M1.	Describe the preparation method, storage requirements, expiration and indicate the appropriate use of blood components.
M2.	Identify and describe the characteristics of the antigens and antibodies of the ABO, Rh, and other blood group systems and apply this knowledge to sample testing and case study materials.
M3.	Describe the immune process as it relates to Immunohematology.
M4.	Demonstrate problem solving by recognizing ABO discrepant results and providing potential resolution of the problem.
M5.	Describe the principles of Weak D testing and explain the definition of Del.
M6.	Describe the principles and perform routine blood bank testing including blood grouping, antibody screening, antibody identification and crossmatching.
M7.	State the requirements for performing compatibility testing.
M8.	Perform and apply knowledge of principles and theories in the performance of routine blood bank procedures utilized in pre-transfusion testing by producing neat, accurate results.
M9.	State the methods for evaluating a positive direct antiglobulin test.

M10.	Describe the cause of the Haemolytic disease of the fetus and newborn (HDFN) and the laboratory tests for HDFN case study.
M11.	List the adverse complications of blood transfusion and state the cause, and if appropriate, investigation and treatment of each.

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, methodologies 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 develop research skills in medical laboratory technology and contribute to the health of the community	✓	✓	✓	✓	✓	✓
P7. To demonstrate effective communication and teamwork skills				✓	✓	✓
P8. To maintain professional and ethical standards in medical laboratory practice and research	✓	✓	✓	✓	✓	✓

PILOs	**M7**	**M8**	**M9**	**M10**	**M11**	
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, methodologies 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 develop research skills in medical laboratory technology and contribute to the health of the community	✓	✓	✓	✓	✓	
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	● Introduction to Transfusion Medicine ● Blood component preparation, storage and quality control (part 1)	**2h**
2	● Blood component preparation, storage and quality control (part 2) ● ABO blood group systems	**2h**
3	● Rh blood group systems ● Other blood group systems	**2h**
4	● ABO discrepancy (1h) ● Weak D testing and Del (1h) ● Class Practice: ABO/RhD grouping and Weak D testing (3.5h)	**5.5h**
5	● Red cell antigen/antibody reaction, detection and factors affecting agglutination ● Principle and application of Antiglobulin Test	**2h**
6	● Antibody screening and antibody identification ● Class Practice: Antibody Screening & Antibody Identification	**5.5h**
7	● Compatibility testing (1h) ● Special techniques in antibody identification (1h) ● Class Practice: Red Cell Phenotyping, IAT Crossmatch and Direct Antiglobulin Test Worksheet (3h)	**5h**
8	● Haemolytic disease of the newborn (HDN) ● Antenatal testing and postnatal testing for HDFN	**2h**
9	Transfusion transmitted diseases and transfusion adverse reaction	**2h**
10	**Final Examination**	**2h**

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. Experiment				✓	✓	✓

Teaching and Learning Activities	**M7**	**M8**	**M9**	**M10**	**M11**	
T1. Lectures	✓	✓	✓	✓	✓	
T2. Experiment	✓	✓	✓			

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. Lab Report	30%	M4-M9
A2. Final Exam	70%	M1-M11

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.

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

Assessment Activities	Assessment Criteria	Mark Ranges				
		88-100	73-87	58-72	50-57	<50
A1. Review of literature Writing	Knowledge and writing skills of frontiers and research in the field of clinical microbiology	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels
A2.Presentation	Teamwork and personal presentation skills	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels
A3.Experimental Skills Exam	Demonstrate technical understanding and operational ability	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels
A4.Experimental Report	Report and summary of experimental results	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels
A5.Mid-term 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

A6.Final Examination	Demonstrate the ability to understand and apply the subjects covered in the classroom	Excellent	Good/ Very Good	Satisfactory	Marginal Pass	Fail; not reaching marginal levels

REQUIRED READINGS

1. Harvey G. Klein & David J. Anstee (2014). Mollison's Blood Transfusion in Clinical Medicine, 12th Edition. Hoboken, NJ: Wiley-Blackwell.
2. Marcela Contreras (2009). ABC of Transfusion, 4th Edition. Hoboken, NJ: Wiley-Blackwell.
3. Sally V. Rudmann (2005). Textbook of Blood Banking and Transfusion Medicine, second Edition. US: Elsevier
4. Macao Blood Transfusion Service http://www.ssm.gov.mo/cts/

REFERENCES

1. Harvey G. Klein & David J. Anstee (2014). Mollison's Blood Transfusion in Clinical Medicine, 12th Edition. Hoboken, NJ: Wiley-Blackwell.
2. Marcela Contreras (2009). ABC of Transfusion, 4th Edition. Hoboken, NJ: Wiley-Blackwell.
3. Sally V. Rudmann (2005). Textbook of Blood Banking and Transfusion Medicine, second Edition. US: Elsevier
4. Macao Blood Transfusion Service http://www.ssm.gov.mo/cts/

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/.