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	2025-2026	Semester	II
Module Code	BSRM3102		
Learning Module	Research Methods		
Pre-requisite(s)	Nil		
Medium of Instruction	Chinese & English		
Credits	4	Contact Hours	60
Instructor	Zeng Dejian Gao Lingling	Email	djzeng@mpu.edu.mo llgao@mpu.edu.mo
Office	M730, Meng Tak Building M702, Meng Tak Building	Office Phone	85993435 85993424

MODULE DESCRIPTION

This 60-hour course aims to improve the understanding of students in healthcare research with emphasis on the concept of scientific investigation; experimental design; research project planning; data measurement and collection; qualitative and quantitative data analysis; research proposal and poster creation; the basic concepts of ethical issues in scientific and medical research; research utilization and evidence based practice. This course also prepares students for writing thesis, medical articles and research papers.

MODULE INTENDED LEARNING OUTCOMES (ILOS)

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

M1.	Understand the purpose and concepts of medical research.
M2.	Propose and implement research project.
M3.	Analysis and Interpret research results.
M4.	Evaluate research articles.
M5.	Understand of basic concepts in research utilization and evidence-based practice.
M6.	Write research reports and thesis.

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	1. Subject introduction -2 hours 1.1 Academic research 1.2 Key terms in research 1.3 Dimensions of research 1.4 General research process 1.5 Key challenges of conducting research 2. Basic concepts in research -2 hours 2.1 Topic 2.2 Research problems 2.3 Research questions 2.4 Hypotheses 2.5 Statement of purpose 2.6 Aims and objectives	4
2	3. Research ideas -3 hours 3.1 Source of research ideas 3.2 Global health agendas 4. Development of research problems -1 hours 4.1 Significance of the problems 4.2 Research ability of the problem	4
3	*(cont.)* Development of research problems -2 hours 4.3 Time and timing	4

	4.4 Availability of study participants 4.5 Co-operation 4.6 Facilities and equipment 4.7 Cost 4.8 Experience of the researcher 4.9 Case studies and group exercises 5. Selection of study participants (2 hours) 5.1 Populations and samples 5.2 Clinical and community populations 5.3 Convenience and probability samples 5.4 Selection criteria 5.5 Subject information sheet / consent form	
4	6. Data collection approaches (3 hours) 6.1 Self-reports 6.2 Observation 6.3 Biophysiological measures 6.4 Data collection plan	3
5	7. Questionnaires -2 hours 7.1 Designing questionnaires 7.2 Styles and wording in questionnaires 7.3 Method of distribution / recruitment 7.4 Examples and exercises 8. Research bias and controls -2 hours 8.1 Haphazard bias 8.2 Systematic bias 8.3 Group exercises	4
6	9. Qualitative data analysis -4 hours 9.1 Transcribing 9.2 Categorization 9.3 Coding 9.4 Field notes	4
9	10. Quantitative Research (4 hours) 10.1 Introduction to Quantitative Research 10.2 Model for Conceptualizing Quantitative Research 10.3 Creating the Foundation for Quantitative Research 10.4 Research Hypotheses for Quantitative Research 10.5 Research Questions in Quantitative Research 10.6 Types of Variables 10.7 Making the Case for Quantitative Research	4
10	11. Ethical Issue -2 hours 11.1 Respect for persons 11.2 Beneficence 11.3 Review board approval 11.4 Special regulations for vulnerable 12. Copyright and plagiarism -2 hours 12.1 Authorship 12.2 Rights to authors 12.3 Reprints and postprints 12.4 Responsibilities of investigators	4

	12.5 Scientific misconduct 12.6 Conflicts of interest 12.7 Types of plagiarism 12.8 Examples	
11	13. Scientific journal -2 hours 13.1 Content of journal articles 13.2 Professional magazines and peer review journal 13.3 Science citation index 13.4 Letters 13.5 Research notes 13.6 Research articles 13.7 Supplemental articles 13.8 Review articles 13.9 Impact factor 13.10 Examples 14. Research Poster --2 hours 14.1 Purposes of scientific posters 14.2 Content of scientific posters Skills in making effective scientific posters	4
12	15. Literature review- 4 hours 15.1 Purposes of literature review 15.2 Content of literature review 15.3 Skills and styles in writing literature review 15.4 Organization framework for literature review 15.5 Examples and group exercises	4
14	*(cont.)* Literature review- 2 hours 15.6 Purposes of literature review 15.7 Content of literature review 15.8 Skills and styles in writing literature review 15.9 Organization framework for literature review 15.10 Examples and group exercises 16. Research proposal: Aims, Contents and format (1) -4 hours	6
15	17. Research proposal: Aims, Contents and format (2)-6 hours	6
16	18. Research proposal: example and exercise (3) -5 hours	5
16	19. Oral defense (4 hours)	4

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 and videos	✓	✓	✓	✓	✓	✓
T2. Group discussion	✓	✓	✓	✓	✓	✓
T3. Oral defense	✓	✓	✓	✓	✓	✓

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. Group reports	40%	M1-M6
A2. Proposal and oral defense	60%	M1-M6

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

No resit exam will be arranged for this learning module.

Make-up assessments will not be provided for the 'Group reports' and 'Oral defense' under any circumstances. Students who are absent will receive a score of zero for that assessment.

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.

澳門理工大學健康科學及體育學院

生物醫學技術理學士課程 (2025-2026)

論文建議書答辯評分表

組別：

學生姓名： _____ **學生編號：**

論文題目： _____

(每項由 0-100 分)

範圍	準則	評語	評分(0-100)
研究問題描述及理論架構 *(20%)*	● 目標具體合理 ● 具研究意義 ● 理論架構明確		
研究方法及計劃 *(40%)*	● 取樣合理可行 ● 研究設計及技術考慮周詳 ● 研究計劃合理完善 ● 危險性評估周詳，研究安全可行 ● 預算及採購計劃合理可行		
表述 *(20%)*	● 文字表達清楚明確、層次分明 ● 握要及完整 ● 條理分明 ● 有效運用各種圖表 ● 按照論文格式編寫		
個人表現 *(20%)*	● 是否經常無故：缺席、遲到、早退 ● 主動參與各項工作 ● 與其他組員採取合作態度 ● 提出良好構思 ● 操作各項實驗技術優良		
		總得分：	

指導老師簽署：_____ (　年　月　日)

MARKING SCHEME

Marks Ranges	Grade	Grade Point	Grade Definitions**
93–100 88 – 92	A A-	4.0 3.7	Excellent
83 – 87	B+	3.3	Very Good
78–82 73 – 77	B B-	3.0 2.7	Good
68–72 63–67 58 – 62	C+ C C-	2.3 2.0 1.7	Satisfactory
53 – 57 50 – 52	D+ D	1.3 1.0	Passed
0 – 49	F	0	Failed

REQUIRED READINGS

Stephen Polgar, & Shane A. Thomas. (2019) Introduction to Research in the Health Sciences, 7th Edition. Elsevier. ISBN-978-0702074936

陳世耀,劉曉清.(2022) 醫學科研方法,(第2版). 北京:人民衛生出版社.2022.ISBN-9787117324373

REFERENCES

Bhattacharya P.K.(Ed.). (2021) Research Methodology in the Health Sciences: A Quick Reference Guide. McGraw Hill.
https://accessmedicine.mhmedical.com/content.aspx?bookid=3018&sectionid=253382815

Forister J. Glenn, & Blessing J. Dennis.(2020) Introduction to Research and Medical Literature for Health Professionals, 5th Edition. Jones & Bartlett Learning

Ann Bowling. (2023)Research Methods in Health: Investigating Health and Health Services,5th Edition. Open University Press.ISBN-13978-0335250929

Carolyn Hicks. (2009) Research Methods for Clinical Therapists. Churchill Livingstone.

Felicity Smith & Sally-Anne Francis. (2008) International Research in Healthcare. Pharmaceutical Press.

Hulley, Stephen B.; Cummings, Steven R.; Browner, Warren S.; Grady, Deborah G. & Newman, Thomas B. (2007) Designing Clinical Research. Lippincott Williams & Wilkins.

Tom Heath and Christian Bizer. (2011) Linked Data: Evolving the Web into a Global Data Space. Morgan & Claypool Publishers.

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/.

Appendix 1 Timetable (MLT)

Week	Date	Time	Teacher	Content Coverage	Classroom
1	09/01/2026	09:00-13:00	Gao Lingling	Subject introduction -2 hours Basic concepts in research -2 hours	General
2	16/01/2026	09:00-13:00	Gao Lingling	Research ideas -3 hours Development of research problems -1 hours	General
3	23/01/2026	09:00-13:00	Gao Lingling	*(cont.)* Development of research problems -2 hours Selection of study participants (2 hours)	General
4	30/01/2026	10:00-13:00	Gao Lingling	Data collection approaches (3 hours)	General
5	06/02/2026	09:00-13:00	Zeng Dejian	Questionnaires -2 hours Research bias and controls -2 hours	General
6	13/02/2026	09:00-13:00	Zeng Dejian	Qualitative data analysis -4 hours	Computer room
9	06/03/2026	09:00-13:00	Zeng Dejian	Quantitative Research (4 hours)	Computer room
10	13/03/2026	09:00-13:00	Zeng Dejian	Ethical Issue -2 hours Copyright and plagiarism -2 hours	General
11	20/03/2026	09:00-13:00	Zeng Dejian	Scientific journal -2 hours Research Poster --2 hours	Computer room
12	27/03/2026	09:00-13:00	Zeng Dejian	Literature review- 4 hours	Computer room
14	08/04/2026 10/04/2026	11:00-13:000 09:00-13:00	Zeng Dejian	*(cont.)* Literature review- 2 hours Research proposal: Aims, Contents and format (1) -4 hours	Computer room
15	15/04/2026 17/04/2026	11:00-13:00 09:00-13:00	Zeng Dejian	Research proposal: Aims, Contents and format (2)-6 hours	Computer room
16	22/04/2026 23/04/2026	11:00-13:00 10:00-13:00	Zeng Dejian	Research proposal: example and exercise -5 hours	Computer room
16	24/04/2026	09:00-13:00	Zeng Dejian/ Gao Lingling	Oral defense (4 hours)	General