FACULTY OF APPLIED SCIENCES

BACHELOR OF SCIENCE IN COMPUTING

LEARNING MODULE OUTLINE

Academic Year	2024/2025	Semester	1
Module Code	MATH2111		
Learning Module	Statistics		
Pre-requisite(s)	Nil		
Medium of Instruction	English		
Credits	3	Contact Hours	45 hrs
Instructor	Dr. Edmund Yung	Email	edmundyung@mpu.edu.mo
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MODULE DESCRIPTION

This is a foundation module in statistical methods with the necessary probability included. Topics cover basic statistical theory, construction of charts, descriptive statistics and probability theory basics. Presentation of probability distributions, confidence intervals, correlation and regression analyses are also dealt with.

MODULE INTENDED LEARNING OUTCOMES (ILOS)

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

M1.	Explain the basic concepts of statistics; (C1)
M2.	Summarize numeric and categorical data by graphical displays; (C2)
M3.	Summarize numeric data by computing descriptive statistics; (C2)
M4.	Apply basic probability theory; (C1)
M5.	Estimate means using confidence intervals for single population; (C2)
M6.	Explain the differences among various statistical techniques and identify an appropriate technique for a given set of variables. (C1)

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

PILOs		M1	M2	M3	M4	M5	M6
P1.	Select and apply proven methods, tools and techniques to the effective and efficient implementation of information systems on common platforms, including the Internet platform;						
P2.	Acquire essential knowledge in specific fields of computing disciplines including networking, artificial intelligence and						

	security;						
P3.	Apply necessary mathematical techniques to model, analyse and devise solutions to complex problems;	✓	✓	✓	✓	✓	✓
P4.	Work independently to develop an understanding of, and the knowledge and skills associated with the general support and mitigation of security risks of computer systems and networks;						
P5.	Design and implement relational database, with an emphasis on how to organise, maintain, retrieve and analyse information;						
P6.	Distinguish the fundamental and operational issues of computer systems, with considerations of user, business, ethical, societal and environmental needs;						
P7.	Evaluate, prepare and communicate effectively on technical information to both technical and non-technical audience;						
P8.	Work as an effective member of a team in the analysis, design and development of software systems, with recognition of requirement to support equality, diversity and inclusion;						
P9.	Use project planning, risk management and quality management techniques in solutions to complex problems;						
P10.	Build the capacity and desire for lifelong learning and to learn advanced and emerging technologies on one's own;						
P11.	(For Business Intelligence specialization) Gain an in-depth knowledge of technologies related to data analysis and management of information to support business processes in enterprises;						
P12.	(For Gaming Technology specialization) Acquire the general and advanced knowledge of current technologies and operating environment for the development of the gaming and tourism industry;						
P13.	(For Computer Education specialization) Acquire general and practical knowledge of computer education and its practicing environment in secondary education;						

MODULE SCHEDULE, COVERAGE AND STUDY LOAD

Week	Content Coverage	Contact Hours
1-3	1. Presentation of Data	9
	1.1 Types of data	
	1.2 Bar charts	
	1.3 Histograms	
	1.4 Frequency Polygons	
	1.5 Pie charts	
4-5	2. Measures of Central Tendency and Dispersion	6
	2.1 Mean, median and mode	

	2.2 Range, variance and standard deviation		
6-7	3. Probability	6	
	3.1 Mutually exclusive vs. non-mutually exclusive events		
	3.2 Independent vs. dependent events		
	3.3 The addition rule and the multiplication rule		
8-9	4. Probability Distributions	6	
	4.1 Random variables		
	4.2 The Binomial distribution		
	4.3 The Normal distribution		
10-11	5. Estimation	6	
	5.1 Point estimation		
	5.2 Interval estimation		
12-13	6. Correlation Analysis	6	
	6.1 The Product-Moment correlation		
	6.2 The Rank correlation		
14-15	7. Regression Analysis	6	
	7.1 Scatter diagrams		
	7.2 Fitting regression lines		
	7.3 The least squares technique		

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. In-class exercises	✓	✓	✓	✓	✓	✓

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 (%)	AHEP4 LOs	ILOs to be Assessed
A1. Assignment / Classwork	10%	C1, C2	M1, M2, M3, M4, M5, M6
A2. Tests	40%	C1, C2	M1, M2, M3, M4, M5, M6
A3. Examination	50%	C1, C2	M1, M2, M3, M4, M5, M6

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.

Students with an overall score of less than 35 in the coursework must take the re-sit examination even if the overall score for the module is 50 or above.

Students with a score of less than 35 in the final examination must take the re-sit examination even if the overall score for the module is 50 or above.

Students with an overall final grade of less than 35 are NOT allowed to take the re-sit examination.

REQUIRED READINGS

1.   Larson, R. & Farber, B. (2018). Elementary Statistics: Picturing the World (7th ed.). Pearson.

REFERENCES

1.   Freund, J.E. (2001). Modern Elementary Statistics. Englewood Cliffs, NJ: Prentice Hall.

2.   Wonnacott, T.H.,&Wonnacott, R.J. (1990). Introductory Statistics. New York: Wiley.

3.   Kazmier, L.J.,& Pohl, N.F. (1987). *Basic Statistics for Business and Economics*. Singapore: McGraw-Hill.

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/.