澳門理工大學
Universidade Politécnica de Macau
Macao Polytechnic University

FACULTY OF BUSINESS

BACHELOR OF E-COMMERCE

LEARNING MODULE OUTLINE

Academic Year	2024 / 2025	Semester	1
Module Code	MATH2100-211		
Learning Module	Business Mathematics		
Pre-requisite(s)	Nil		
Medium of Instruction	English		
Credits	3	Contact Hours	45
Instructor	Siu Wai Cheong	Email	siuwaich@mpu.edu.mo
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MODULE DESCRIPTION

This module emphasizes the mathematics required in general business processes. It is designed to prepare students for the mathematical and analytical applications most useful in subsequent business and economics courses. Topics include: functions and graphs, mathematics of finance, matrix algebra, linear programming, and basic calculus.

MODULE INTENDED LEARNING OUTCOMES (ILOS)

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

M1.	Explain the concepts of mathematics;
M2.	Explain the rationales behind the mathematical formulae;
M3.	Apply mathematical skills to solve simple real-world problems;
M4.	Formulate simple real-world problems into mathematics problems;
M5.	Demonstrate the ability to think abstractly, critically and mathematically.

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

PILOs of E-Commerce Program	**M1**	**M2**	**M3**	**M4**	**M5**
P1. Demonstrate an understanding of the business processes and operations and the skillful realization of information technologies required to practice electronic commerce.					
P2. Apply knowledge in business, mathematics, programming, computing, web development, and database to address complex problems in the context of electronic commerce.	✓	✓	✓	✓	✓

P3. Analyze critically the effect of web technology use on organizational performance and develop electronic commerce strategies that fit organizational objectives.					
P4. Select and apply tools and technologies to effectively implement electronic commerce systems in business intelligence, enterprise resources planning, supply chain management, and customer relationship management.					
P5. Develop relationships, motivate others, manage conflicts, lead changes, and work across differences in multi-disciplinary electronic commerce projects.					
P6. Communicate and work effectively using written and spoken word, non-verbal language, and electronic tools with fellow professionals and different stakeholders in the electronic commerce industry.					
P7. Demonstrate a global electronic commerce perspective as evidenced by an understanding of foreign languages and the role of Macau as an interface between the East and the West.					
P8. Cope with and manage contemporary advancement related to electronic commerce development and demonstrate lifelong learning attitudes and abilities.					
P9. Conduct research and devise innovative electronic commerce models to exploit business opportunities.					
P10. Reflect on professional responsibilities and keep up with the latest electronic commerce issues on legal, environmental, ethical, and societal considerations to benefit society comprehensively.					

MODULE SCHEDULE, COVERAGE AND STUDY LOAD

Week	Content Coverage	Contact Hours
1	1. Functions and Graphs 1.1 Functions 1.2 Elementary Functions: Graphs and Transformations 1.3 Quadratic Functions 1.4 Polynomial and Rational Functions 1.5 Exponential Functions 1.6 Logarithmic Functions	3
2, 3	2. Mathematics of Finance 2.1 Simple Interest 2.2 Compound and Continuous Compound Interest 2.3 Future Value of an Annuity; Sinking Funds 2.4 Present Value of an Annuity; Amortization	6
4, 5	3. Systems of Linear Equations; Matrices 3.1 Review: Systems of Linear Equations in Two Variables 3.2 Systems of Linear Equations and Augmented Matrices 3.3 Gauss-Jordan Elimination 3.4 Matrices: Basic Operations	6

	3.5 Inverse of a Square Matrix 3.6 Matrix Equations and Systems of Linear Equations	
6	4. Linear Inequalities and Linear Programming 4.1 Linear Inequalities in Two Variables 4.2 Systems of Linear Inequalities in Two Variables 4.3 Linear Programming in Two Dimensions: A Geometric Approach	3
7	Test	3
8, 9	8. Limits and the Derivative 8.1 Introduction to Limits 8.2 Infinite Limits and Limits at Infinity 8.4 The Derivative 8.5 Basic Differentiation Properties 8.7 Marginal Analysis in Business and Economics	6
10	9. Additional Derivative Topics 9.2 Derivatives of Exponential and Logarithmic Functions 9.3 Derivatives of Products and Quotients 9.4 The Chain Rule	3
11, 12	10. Graphing and Optimization 10.1 First Derivative and Graphs 10.2 Second Derivative and Graphs 10.4 Curve-Sketching Techniques 10.5 Absolute Maxima and Minima 10.6 Optimization	6
13, 14	11. Integration 11.1 Antiderivatives and Indefinite Integrals 11.2 Integration by Substitution 11.3 Differential Equations; Growth and Decay 11.4 The Definite Integral 11.5 The Fundamental Theorem of Calculus	6
15	Final Examination	3

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**
T1. Lecture	✓	✓	✓	✓	✓
T2. Classwork (exercises/assignments)	✓	✓	✓	✓	✓

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. Classwork exercises/assignments (graded)	20%	M1 – M5
A2. Test (graded)	30%	M1 – M5
A3. Final examination (graded)	50%	M1 – M5
Total	100%	

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 Task	Criterion	Excellent	Very Good, Good	Satisfactory	Pass	Fail
			A, A-	B+, B, B-	C+, C, C-	D+, D	F
			88% - 100%	73% - 87%	58% - 72%	50% - 57%	0 – 49%
1.	Classwork (exercises/assignments)	Demonstrate the understanding of the subjects, practice and improve problem solving skills.					
2.	Test	Demonstrate the					

		understanding of the subjects and the ability to apply the methods learnt in problem solving.					
3.	Final Exam / Re-sit Exam	Demonstrate the understanding of the subjects and the ability to apply the methods learnt in problem solving.	High	Significant	Moderate	Basic	Not even reaching marginal levels

REQUIRED READINGS

Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen, and Christopher J. Stocker, 2019, *College Mathematics for Business, Economics, Life Sciences and Social Sciences*, 14th Edition, Pearson Education

REFERENCES: Nil

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/.