Macao Polytechnic Institute

School of Applied Sciences

Bachelor of Science in Computing

Module Outline

Academic Year   2021/2022   Semester   2

Learning Module	Selected topics III - Linear Algebra	Class Code		COMP408
Pre-requisite(s)				
Medium of Instruction	English		Credit	3
Lecture Hours	45 hrs	Lab/Practice Hours	0 hrs	Total Hours	45 hrs
Instructor	Dennis Wong	E-mail	cwong@ipm.edu.mo	
Office	N46B	Telephone	85996845	

Description

This learning module introduces basic concepts and techniques from linear algebra that will be required in later computer science areas such as machine learning and computer graphics. Topics include vectors, matrix operations, systems of linear equations and eigenvalues and eigenvectors

Learning Outcomes

After completing the learning module, students will be able to:

1. Tell the concept of linear algebra; (SM2p)

2. Utilize basic linear algebra techniques as an important problem-solving tool; (SM2p, EA3p, EP1p)

3. Capable of solving systems of linear expressions; (SM2p)

4. Describe properties of linear systems using vectors; (SM2p)

5. Capable to compute and interpret determinants of matrices; (SM2p)

6. Demonstrate an understanding of eigenvalues and eigenvectors. (SM2p)

Content

1. Introduction to Vectors   (3 hours)

    1.1 Vector operations

    1.2 Scalar-vector multiplication

    1.3 Linear Combinations of Vectors

7. Eigenvectors and Eigenvalues   (6 hours)

    7.1 Eigenvectors and Eigenvalues

    7.2 Characteristic Equation

    7.3 Diagonalization

    7.4 Eigenvectors and Linear Transformations

Teaching Method

Lectures and tutorials

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 module will not be permitted to sit the final or 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 being the passing score.

	Item	Description	AHEP3 LO	Percentage
1.	Assignments / Classwork	Home- / Classroom-based exercises	SM2p, EA3p, EP1p	30%
2.	Tests	Knowledge assessment	SM2p, EA3p, EP1p	30%
3.	Examination	3-hour written examination	SM2p, EA3p, EP1p	40%
			Total Percentage:	100%

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.

Teaching Material

Textbook(s)

Introduction to Linear Algebra (Fifth Edition). G. Strang. MIT Press, 2016.

Reference

Reference book(s)

Linear Algebra and Its Applications (Fourth Edition). David Lay, Steven Lay, and Judi McDonald, Pearson Education, 2015.