

## Liverpool John Moores University

Title: LINEAR ALGEBRA  
Status: Definitive  
Code: **4110MATHS** (124191)  
Version Start Date: 01-08-2021

Owning School/Faculty: Computer Science and Mathematics  
Teaching School/Faculty: Computer Science and Mathematics

Team	Leader
Amir Asghari	Y

**Academic Level:** FHEQ4      **Credit Value:** 20      **Total Delivered Hours:** 57  
**Total Learning Hours:** 200      **Private Study:** 143

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	22
Practical	33

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Portfolio	AS1	A collection of tasks to enhance understanding	30	
Exam	AS2	Examination	60	2
Future Focus e-learning task	FF	Future Focus e-learning task	10	

### Aims

*To provide the basic concepts and techniques of linear algebra. To develop manipulative skills in matrix algebra.  
Complete a Future Focus e-learning task*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Perform matrix algebra concepts and operations
- 2 Solve linear systems of linear algebraic equations, understand the conditions for the existence of solutions.
- 3 Calculate advanced matrix and vector operations (e.g., eigenvalues and eigenvectors; orthogonal projections) in application areas.
- 4 Gain a deeper understanding of personal strengths and weaknesses as they relate to applications for employment.

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Portfolio	1	2	3	4
Examination	1	2	3	
Future Focus	4			

## Outline Syllabus

- Matrix algebra concepts, including multiplication determinants, inverses
- Echelon form. Special types of matrices: diagonal, unity symmetric, orthogonal.
- Methods for solving Linear Systems: Row Reduction, Gaussian elimination.
- Eigenvalues and eigenvectors, similarity transformations.
- Orthogonal projections

## Learning Activities

Lectures will introduce concepts, which students will learn using pencil-and-paper and mathematical software.

## Notes

This module provides students with the experience of using pencil-and-paper techniques and mathematical software to solve realistic problems in Linear Algebra.