Northeastern University
London

Differential Equations and Linear Algebra Course Descriptor

Course Code	LMATH4138	Discipline	Math
UK Credit	15	US Credit	4
FHEQ level	4	Date approved	November 2022
Pre-requisites	LMATH4204 Mathematical Methods I Or equivalent		
Co-requisites	N/A		

Course Overview

This differential equations and linear algebra course is intended for students who have developed an understanding of mathematical concepts used in single variable calculus (Mathematical Method I & II). The course explores the following topics: linear equations and its applications, Laplace Transform and its inverses, Gaussian Elimination, Introduction to eigenvalues and eigenvectors.

Differential equations and linear algebra are essential to the everyday application of mathematics and engineering. Linear Algebra plays a vital role in developing computational methods, and differential equations are grounded in modelling techniques employed in the fields of Engineering, Physics, Chemistry, Economics, Computer Graphics and more. The topics in this course will help students build an all-rounded computational and modelling foundation to support their academic journey as well as their future career beyond academia.

Learning Outcomes

On successful completion of the course, students will be able to:

Knowledge And Understanding

K1a   Acquire the understanding of the notions of vector spaces.

K2a   Acquire knowledge and understanding of linear transformation.

K3a   Develop elementary concepts of numerical analysis.

Subject Specific Skills

S1a   Develop competence in solving first order differential equations.

S2a   Develop competence towards systems of linear equations in several variable using Gaussian elimination.

Transferable and Professional Skills

T2a   Develop mathematical thinking and problem-solving skills to solve real-world problems.

Teaching and Learning

Teaching and learning strategies for this course will include:

A minimum of 36 contact hours, typically to include interactive group teaching, co-curriculars, individual meetings, in-class presentations and exams.

Course information and supplementary materials are available on the University's Virtual Learning Environment (VLE).

Students will receive individualised developmental feedback on their work for this course.

Students are required to attend and participate in all the formal and timetabled sessions for this course. Students are also expected to manage their directed learning and independent study in support of the course.

Assessment

Formative

Students will be formatively assessed in class through class activities, and during office hours. Formative assessments are ones that do not count towards the final grade but will provide students with developmental feedback.

Summative

AE:	Assessment Activity	Weighting (%)	Duration	Length
1	Examination	50	1 hour and 15 minutes	
2	Examination	50	1 hour and 15 minutes	

Further information on the structure of summative assessment elements can be found in the Summative Assessment Briefs.

Feedback

Students will receive feedback in a variety of ways: written (including via email correspondence); oral (within office hours or on an *ad hoc* basis) and indirectly through class discussion.

Feedback on examinations is provided through generic internal examiners' reports and are made available to the student on the VLE.

Indicative Reading

Note: Comprehensive and current reading lists for courses are produced annually in the Course Syllabus or other documentation provided to students; the indicative reading list provided below is used as part of the approval/modification process only.

Books

Title: Worldwide Differential Equations and Linear Algebra

Author: Robert McOwen

Indicative Topics

Students will study the following topics:

- Differential equations and its applications
- Linear equations and its applications
- Laplace transform and its inverses
- Gaussian elimination
- Introduction to eigenvalues and eigenvectors

Title: LMATH4138 Differential Equations and Linear Algebra					
Approved by: Academic Board					
Location: Academic Handbook/Programme Specifications and Handbooks/Mobility					
Version number	Date approved	Date published	Owner	Proposed next review date	Modification (As per AQF4) & category number
1.2	October 2023	October 2023	Dr. Marianna Koli	November 2027	Category 1: Corrections/clarifications to documents which do not change approved content or learning outcomes.
1.1	January 2023	January 2023	Dr. Marianna Koli	November 2027	Category 1: Corrections/clarifications to documents which do not change approved content or learning outcomes.
1.0	November 2022	November 2022	Dr. Marianna Koli	November 2027	