

Requirements
This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.

No Co-requisite modules listed

No requirements listed

MATH C4501: Engineering Mathematics IV

| anguage of Instruction: English Followite: 5 Followite: 8 Induite Delivered In 1 programme(s) Lectures, practicals, private study Induite Aim: The aim of this module is to equip students with the skills to use vector and matrix methods to model and solve civil engineering problems. In successful completion of this module the learner should be able to: 101 1 Use vectors to model more complicated problems involving forces and motion. 102 1 Describe the nature and behaviour of scalar and vector fields. 1 Use matrix methods to solve systems of linear equations and linear differential equations. 1 Write simple programs using MATLAB. 1 The re-requisite learning (or a practical skill) that is recommended before enrolment in this module. 1 MATH C2502 Mathematics and Statistics II 1 moompatible Modules These are modules which have learning outcomes that are too similar to the learning outcomes of this module. | | XX | University | | | |
|---|---|---|--|--|--|--|
| FC Level: 8 Fo Level: 8 | Module Title: | | Engineering Mathematics IV | | | |
| Indule Delivered In 1 programme(s) | Language of Instruction: | | English | | | |
| Indule Delivered In 1 programme(s) Exacting & Learning Lectures, practicals, private study Indule Aim: The aim of this module is to equip students with the skills to use vector and matrix methods to model and solve civil engineering problems. In successful completion of this module the learner should be able to: O1 Use vectors to model more complicated problems involving forces and motion. O2 Describe the nature and behaviour of scalar and vector fields. O3 Use matrix methods to solve systems of linear equations and linear differential equations. O4 Write simple programs using MATLAB. Inter-requisite learning Module Recommendations This is prior learning (or a practical skill) that is recommended before enrolment in this module. O415 MATH C2502 Mathematics and Statistics II Incompatible Modules These are modules which have learning outcomes that are too similar to the learning outcomes of this module. | Credits: 5 | | | | | |
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| Write simple programs using MATLAB. Tre-requisite learning Module Recommendations This is prior learning (or a practical skill) that is recommended before enrolment in this module. MATH C2502 Mathematics and Statistics II Mathematics are modules which have learning outcomes that are too similar to the learning outcomes of this module. It is incompatible modules listed It is incompatible modules listed It is incompatible modules listed It is incompatible modules It is incompatible | LO2 | Describe the na | ature and behaviour of scalar and vector fields. | | | |
| And the Recommendations This is prior learning (or a practical skill) that is recommended before enrolment in this module. MATH C2502 Mathematics and Statistics II Incompatible Modules These are modules which have learning outcomes that are too similar to the learning outcomes of this module. It is incompatible modules listed | LO3 | Use matrix methods to solve systems of linear equations and linear differential equations. | | | | |
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| This is prior learning (or a practical skill) that is recommended before enrolment in this module. MATH C2502 | Pre-requisit | Pre-requisite learning | | | | |
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| · · · | | Incompatible Modules These are modules which have learning outcomes that are too similar to the learning outcomes of this module. | | | | |
| 2 requisite Modules | No incompat | No incompatible modules listed | | | | |
| o-requisite modules | Co-requisite | e Modules | | | | |



MATH C4501: Engineering Mathematics IV

Module Content & Assessment

Indicative Content

Vector methods

(a) Review of material previously covered. (b) Scalar and vector products. (c) Calculus for vector functions of a variable. (d) Application of vector methods to modelling of forces and motion.

Scalar and vector fields

(a) Scalar and vector fields. (b) Gradient, divergence and curl. (c) Application to heat and fluid flow.

Matrix methods

(a) Review of material previously covered. (b) Types of solution sets for non-homogeneous systems and homogeneous systems, overdetermined and underdetermined systems. (c) Eigenvalues and eigenvectors. (d) Using eigenvalues and eigenvectors to solve systems of linear differential equations.

Introduction to programming with MATLAB

(a) Operators and arrays. (b) Script files. (c) Function files. (d) Plotting 2-D and 3-D graphs. (d) Relational and logical operators. (e) Conditional statements and Loops.

| Assessment Breakdown | % | |
|-----------------------|--------|--|
| Continuous Assessment | 60.00% | |
| Practical | 40.00% | |

| Continuous Assessment | | | | |
|------------------------|------------------------|----------------------|---------------|--------------------|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
| Examination | Class Test 1 | 1,2 | 30.00 | Week 8 |
| Examination | Class Test 2 | 3 | 20.00 | Week 13 |
| Short Answer Questions | Quiz questions | 1,2,3 | 10.00 | Ongoing |

No Project

| Practical | | | | | |
|-----------------------------|------------------------|----------------------|---------------|--------------------|--|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date | |
| Practical/Skills Evaluation | Assessed Practical 1 | 1,2,4 | 20.00 | Week 6 | |
| Practical/Skills Evaluation | Assessed Practical 2 | 3,4 | 20.00 | Week 12 | |

No End of Module Formal Examination

SETU Carlow Campus reserves the right to alter the nature and timings of assessment



MATH C4501: Engineering Mathematics IV

Module Workload

| Workload: Full Time | | |
|-------------------------|-----------------------|---------------------------------------|
| Workload Type | Frequency | Average Weekly Learner Workload |
| Lecture | 12 Weeks per Stage | 2.00 |
| Practicals | 12 Weeks per Stage | 2.00 |
| Estimated Learner Hours | 15 Weeks per Stage | 6.00 |
| | Total Hours | 138.00 |

Module Delivered In

| Programme Code | Programme | Semester | Delivery |
|----------------|--|----------|-----------|
| CW_CMHCE_B | Bachelor of Engineering (Honours) in Civil Engineering | 7 | Mandatory |