**Liverpool** John Moores University


Title:                         Engineering Mathematics B
Status:                      Definitive
Code:                       **4502MTC**   (125776)
Version Start Date:    01-08-2019

Owning School/Faculty:      Maritime and Mechanical Engineering
Teaching School/Faculty:    Maritime and Mechanical Engineering

| Team | Leader |
|------|--------|
| Stewart Chidlow | Y |

| **Academic Level:** | FHEQ4 | **Credit Value:** | 10 | **Total Delivered Hours:** | 34 |
|---|---|---|---|---|---|
| **Total Learning Hours:** | 100 | **Private Study:** | 66 | | |

**Delivery Options**

Course typically offered: Semester 2

| Component | Contact Hours |
|-----------|---------------|
| Online | 24 |
| Tutorial | 10 |


**Grading Basis:** 40 %


**Assessment Details**

| Category | Short Description | Description | Weighting (%) | Exam Duration |
|----------|------------------|-------------|---------------|---------------|
| Test | AS1 | Weekly online coursework delivered using a virtual learning environment | 100 | |


**Aims**

*To provide a foundation in engineering mathematics for its application to the solution of engineering problems*


**Learning Outcomes**

After completing the module the student should be able to:

| 1 | Apply a knowledge of vectors and matrices to solve engineering problems. |
|---|---|
| 2 | Apply the techniques of differentiation and integration to solve engineering problems. |
| 3 | Solve first order ordinary differential equations by the method of separation of variables and apply to the modelling of engineering problems |
| 4 | Use and apply mathematical software to the solution of engineering mathematics problems |

## Learning Outcomes of Assessments

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

Online Assessment        1       2       3       4


## Outline Syllabus

*Introduction of the use of a computer algebra system e.g. MATLAB (MuPAD). Use of the software applied to the syllabus items below*

*Basic vector algebra including Cartesian components and products. Differentiation of vectors. Applications.*
*Basic matrix manipulation including the inverse matrix. Solution of systems of linear equations.*
*Differential calculus of one variable: Gradient of curve, derivatives of standard functions, linearity, derivatives of composite functions, products and quotients. Applications. Stationary points. Rates of change.*
*Integral calculus as inverse of differentiation and as a limit of a sum. Standard integrals, linearity, integration of composite functions. Other methods of integration. Numerical integration.*
*Ordinary differential equations. First order linear, constant coefficient equations. Separation of variables. Application to modelling*


## Learning Activities

A combination of online lectures and tutorials and campus based tutorials.


## Notes

This module provides a foundation in engineering mathematics for level four students to enable them to apply this to the solution of engineering problems.

Coursework assessment will be through online questions delivered using MapleTA (or similar) online assessment software.