

WM175-15 Engineering Mathematics

22/23

Department

WMG

Level

Undergraduate Level 1

Module leader

Shaheen Hassan

Credit value

15

Module duration

13 weeks

Assessment

100% coursework

Study locations

University of Warwick main campus, Coventry Primary

Distance or Online Delivery

Description

Introductory description

This module provides the appropriate mathematical knowledge and skills base for the various modules of the APEP and in order to analyse engineering problems effectively.

[Module web page](#)

Module aims

Typically, students begin with a review of the basics in the first half of the year, with concepts developed further in the second half of the year to enable students to formulate and solve engineering problems mathematically.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

- Calculus refresher and partial derivatives
- Complex numbers

- Matrices, determinants and simultaneous equations
- First & Second order differential equations
- Laplace transforms & their application to solving ordinary differential equations

Learning outcomes

By the end of the module, students should be able to:

- Demonstrate awareness and comprehension of appropriate mathematical terminology and methods.
- Reflect on the efficiency of their approach to the problem and revise their technique where appropriate.
- Justify the choice of mathematical techniques for a given problem based on a sound understanding of the basic concepts taught.
- Combine and manipulate mathematical techniques effectively to explore engineering contexts and solve contextual problems.

Indicative reading list

Croft, A., Davison, R., Mathematics for Engineers. 5th edition. Pearson 2019.
ISBN: 1292253649, 9781292253640

Stroud K.A., Booth D.J. Engineering Mathematics. 7th edition. Palgrave Macmillan 2013.
ISBN: 1137031204, 9781137031204

[View reading list on Talis Aspire](#)

Subject specific skills

communicating mathematically
quantitative reasoning
manipulation of precise and intricate ideas

Transferable skills

analytical skills
problem solving
flexibility
persistence

Study

Study time

Type	Required
Lectures	6 sessions of 1 hour (4%)
Seminars	8 sessions of 1 hour (5%)
Tutorials	6 sessions of 1 hour (4%)
Online learning (scheduled sessions)	19 sessions of 1 hour (13%)
Online learning (independent)	2 sessions of 2 hours (3%)
Private study	47 hours (31%)
Assessment	60 hours (40%)
Total	150 hours

Private study description

The students will complete solution formatting and mathematical resilience elements.

Recapping of prior learning is expected where necessary.

Reading around the topics covered will provide the depth of understanding required to complete the course to a good standard. This may be both prior to and/or after the teaching and learning sessions.

Support from teaching staff is available but students will be expected to increasingly develop their independent learning skills.

Time spent on preparation for assessments is required - advice regarding this will be given.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A1

	Weighting	Study time	Eligible for self-certification
Assessment 1	30%	18 hours	No
Online test to be completed within an hour.			
Assessment 2	70%	42 hours	Yes (extension)
Maths problems including within an engineering context to be solved fully by students. Number of words not relevant as it is calculations that will be submitted but a maximum of 10 sides of A4.			

Feedback on assessment

Assessment 1: Cohort level feedback will be given.

Availability

Courses

This module is Core for:

- Year 1 of UWMS-H7C3 Undergraduate Applied Professional Engineering (Control/Technical Support Engineer)
- Year 1 of DWMS-H7C7 Undergraduate Applied Professional Engineering (Control/Technical Support Engineer) (Degree Apprenticeship)
- Year 1 of UWMS-H7C2 Undergraduate Applied Professional Engineering (Electrical/Electronic Support Engineer)
- Year 1 of DWMS-H7C6 Undergraduate Applied Professional Engineering (Electrical/Electronic Support Engineer) (Degree Apprenticeship)
- Year 1 of UWMS-H7C1 Undergraduate Applied Professional Engineering (Manufacturing Engineer)
- Year 1 of DWMS-H7C5 Undergraduate Applied Professional Engineering (Manufacturing Engineer) (Degree Apprenticeship)
- Year 1 of UWMS-H7C4 Undergraduate Applied Professional Engineering (Product Design and Development Engineer)
- Year 1 of DWMS-H7C8 Undergraduate Applied Professional Engineering (Product Design and Development Engineer) (Degree Apprenticeship)