

WM175-15 Engineering Mathematics

23/24

Department

WMG

Level

Undergraduate Level 1

Module leader

Shaheen Hassan

Credit value

15

Module duration

13 weeks

Assessment

40% coursework, 60% exam

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 module, 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.

- Algebra refresher
- Calculus refresher

- Introduction to 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 different approaches to a given problem and revise techniques as appropriate where needed.
- Communicate clearly mathematically using logical argument evidencing a sound understanding of the concepts taught.
- Manipulate, combine and adapt mathematical techniques to explore engineering contexts and solve contextual problems using a simple and effective approach.

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, mastery of a range of appropriate mathematical techniques

Transferable skills

analytical skills, problem solving, flexibility, persistence, critical thinking, behaviour for lifelong learning, independent learning, self-evaluation

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 D

	Weighting	Study time	Eligible for self-certification
Assessment 1	40%	24 hours	Yes (extension)
Digital assessment of basic maths concepts to be completed in 1.5hrs - all questions to be answered.			
Exam	60%	36 hours	Yes (extension)
Longer maths questions including within engineering contexts - all questions to be answered. To be done online.			

Feedback on assessment

Assessment 1: Individual feedback will be given.

Assessment 2: Cohort-level feedback will be given.

[Past exam papers for WM175](#)

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)