ES193-15 Engineering Mathematics

24/25

Department
School of Engineering
Level
Undergraduate Level 1
Module leader
Michael Chappell
Credit value
15
Module duration
24 weeks
Assessment
100% exam
Study location
University of Warwick main campus, Coventry

Description

Introductory description

ES193-15 Engineering Mathematics

Module web page

Module aims

To present, in context, and provide skills in the application of fundamental Mathematics concepts that underpin all of Engineering. To encourage the development of problem solving as required in other Year 1 modules and in order that more advanced material can be tackled in modules taught in later years.

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.

Mathematics:
Functions, Algebra and Algebraic Manipulation, Co-ordinate Geometry, Differentiation, Vector Algebra, Matrices and Determinants, Matrix Algebra and Linear equations, Complex Numbers,

Partial Differentiation. Integration, Applications of Integration, Solution of 1st and 2nd Order Ordinary Differential Equations, Laplace Transforms, Probability Theory, Discrete and Continuous Probability Distributions.

Learning outcomes

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

- Recognise and be able to apply mathematical tools and techniques to solve engineering based problems. [C1(D), M1(D), C3(D), M3(D)]
- Recognise and be able to apply probabilistic and statistical tools and techniques to solve engineering based problems. [C1(D), M1(D), C3(D), M3(D)]
- Make appropriate assumptions to simplify and thus model real-life Engineering problems. [C1(D), M1(D), C3(D), M3(D)]
- Analyse models using basic mathematical techniques including statistical and numerical techniques. [C1(D), M1(D), C3(D), M3(D)]

Indicative reading list

"Mathematics for Engineers: A Modern Interactive Approach (Fourth Edition)" by Anthony Croft and Robert Davison, Pearson/Prentice Hall, 20015, ISBN 978-1-292-06593-9

Subject specific skills

Ability to integrate analytical, mathematical and programming skills for analysing, developing and critically evaluating mathematical engineering models. Ability to be pragmatic, taking a systematic approach and the logical and practical steps necessary for complex concepts to become a reality.

Transferable skills

Ability to overcome difficulties by employing skills, knowledge and understanding in a flexible manner. Ability to apply mathematical and computational methods to communicate parameters, model and optimise solutions. Ability to apply problem-solving skills, information retrieval, and the effective use of specific software packages and general IT facilities. Ability to plan self-learning and improve performance as the foundation for lifelong learning and continuous professional development.

Study

Teaching split

Provider	Weighting
School of Engineering	78%
WMG	22%

Study time

Type	Required
Lectures	20 sessions of 1 hour (13%)
Seminars	(0%)
Tutorials	20 sessions of 1 hour (13%)
Private study	110 hours (73%)
Total	150 hours

Private study description

110 hours of guided independent learning

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group B3

	Weighting	Study time	Eligible for self-certification
Written Examination 2HR Written Exam	100%		No

- Students may use a calculator
- Answerbook Pink (12 page)
- Engineering Data Book 8th Edition

Feedback on assessment

- On-line tests.
- Worked examples in revision lectures.
- Model solutions to past papers.
- Support through advice and feedback hours.
- Cohort-level feedback on final examination.
- Tutorials

Past exam papers for ES193

Availability

Post-requisite modules

If you pass this module, you can take:

- ES440-15 Computational Fluid Dynamics
- ES4G3-15 Dynamics of 3D Mechanical Systems

Courses

This module is Core for:

- Year 1 of UESA-H335 BEng Automotive Engineering
- Year 1 of UESA-H161 BEng Biomedical Systems Engineering
- Year 1 of UESA-H216 BEng Civil Engineering
- Year 1 of UESA-H63W BEng Electronic Engineering
- Year 1 of UESA-H113 BEng Engineering
- Year 1 of UESA-HN15 BEng Engineering Business Management
- Year 1 of UESA-HH75 BEng Manufacturing and Mechanical Engineering
- Year 1 of UESA-H315 BEng Mechanical Engineering
- Year 1 of UESA-HH35 BEng Systems Engineering
- Year 1 of UESA-HN11 BSc Engineering and Business Studies
- Year 1 of UESA-H336 MEng Automotive Engineering
- Year 1 of UESA-H163 MEng Biomedical Systems Engineering
- Year 1 of UESA-H217 MEng Civil Engineering
- Year 1 of UESA-H63X MEng Electronic Engineering
- Year 1 of UESA-H114 MEng Engineering
- Year 1 of UESA-HH76 MEng Manufacturing and Mechanical Engineering
- UESA-H316 MEng Mechanical Engineering
    - Year 1 of H315 Mechanical Engineering BEng
    - Year 1 of H316 Mechanical Engineering MEng
- UESA-HH31 MEng Systems Engineering
    - Year 1 of HH31 Systems Engineering
    - Year 1 of HH35 Systems Engineering
- Year 1 of UCSA-G406 Undergraduate Computer Systems Engineering
- Year 1 of UCSA-G408 Undergraduate Computer Systems Engineering
- Year 1 of UESA-H605 Undergraduate Electrical and Electronic Engineering
- Year 1 of UESA-H606 Undergraduate Electrical and Electronic Engineering MEng