UNIVERSITY OF WARWICK

Proposal Form for New or Revised Modules (MA1 - version 7 - April 2014)

Approval information	
Approval Type	☐ New module ☒ Revised module ☐ Discontinue module
Date of Introduction/Change	October 2018
If new, does this module replace another? If so, enter module code and title:	.
If revised/discontinued, please outline the rationale for the changes:	To correct errors in the previous MA1 document relating to examination length and departmental split and update based on new degree programmes introduced.
Confirmation that affected departments have been consulted:	Changes were made in consultations between the School of Engineering and WMG. Computer Science have been consulted via the CSE Steering Group.

Module Summary	
1. Module Code (if known)	ES193
2. Module Title	Engineering Mathematics
3a. Lead department:	School of Engineering
3b. Teaching Split (if known):	78% School of Engineering 22% WMG
4. Name of module leader	Prof. Michael Chappell
5. Level	UG: ☒ Level 4 (Certificate) ☐ Level 5 (Intermediate) ☐ Level 6 (Honours) PG: ☐ Level 7 (Masters) ☐ Level 8 (Doctoral) See Guidance Notes for relationship to years of study
6. Credit value(s) (CATS)	15
7. Principal 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.

Module Summary	
8. Principal Learning Outcomes	By the end of the module the student should be able to: • Recognise and be able to apply mathematical tools and techniques to solve engineering based problems. • Recognise and be able to apply probabilistic and statistical tools and techniques to solve engineering based problems. • Make appropriate assumptions to simplify and thus model real-life Engineering problems. • Analyse models using basic mathematical techniques including statistical and numerical techniques.
9. Timetabled Teaching Activities (summary)	20 hours of lectures, 2 hours of revision lectures, 20 hours of tutorials, 2 hours of computer-based formative test and 20 hours of extra support for foundation maths. **Total of 44 hours or up to 64 hours with additional maths support**.
10. Departmental Web-link	http://www2.warwick.ac.uk/fac/sci/eng/eso/modules/year1
11. Other essential notes	Students may be referred for additional support of up to 20 hours by their tutors, and advice and feedback hours, additional seminars, online resources and exercises will be provided as appropriate. Other students entering degree courses without a higher Maths qualification will be tested at the start of the year in order to determine whether they require extra support.
12. Assessment methods (summary)	100% written examination (2 hrs). 0% Tutor marked quiz 0% 2 x Formative tests

For use by Strategic Planning and Analytics Office only - Do not fill in this section

Level	JACS3 Code	Teaching Split
		If not provided in 3b above

External Credit Level		Scheme	

Module Context

13. Please list all departments involved in the teaching of this module. If taught by more than one department, please indicate percentage split.

School of Engineering (78%)
WMG (22%)

14. Availability of module

Degree Code	Title	Study Year	C/OC/ A/B/C	Credits
H113	BEng Engineering	1	C	15
H114	MEng Engineering	1	C	15
H161	BEng Biomedical Systems Engineering	1	C	15
H163	MEng Biomedical Systems Engineering	1	C	15
H216	BEng Civil Engineering	1	C	15
H217	MEng Civil Engineering	1	C	15
H315	BEng Mechanical Engineering	1	C	15
H316	MEng Mechanical Engineering	1	C	15
H335	BEng Automotive Engineering	1	C	15
H336	MEng Automotive Engineering	1	C	15
H605	BEng Electrical and Electronic Engineering	1	C	15
H606	MEng Electrical and Electronic Engineering	1	C	15
H63W	BEng Electronic Engineering	1	C	15
H63X	MEng Electronic Engineering	1	C	15
HH35	BEng Systems Engineering	1	C	15
HH31	MEng Systems Engineering	1	C	15
HH75	BEng Manufacturing and Mechanical Engineering	1	C	15
HH76	MEng Manufacturing and Mechanical Engineering	1	C	15
HN11	BSc Engineering and Business Studies	1	C	15
HN15	BEng Engineering Business Management	1	C	15
G406	BSc/BEng Computer Systems Engineering	1	C	15
G408	MEng Computer Systems Engineering	1	C	15

15. Minimum number of registered students required for module to run

1 (core module).

16. Pre- and Post-Requisite Modules

None.

Module Content and Teaching

17. Teaching and Learning Activities *(totals for module – please see guidance)*	
Module duration (weeks)	24
Lectures	20 hours
Seminars	20 seminars for those requiring additional support
Tutorials	20 hours
Project Supervision	None
Demonstration	None
Practical Class/Workshops	None
Supervised time in studio/workshop	None
Fieldwork	None
External visits	None
Work based learning	None
Placement	None
Year abroad	None
Other activity *(please describe): e.g. distance-learning, intensive weekend teaching etc.*	• 2 x 1hr = 2 hours computer-based formative tests • 2 hours revision lectures • 106 hours of guided independent learning • Up to 20 hours additional maths support.

18. Assessment Method (Standard)		
Type of assessment	**Length**	**% weighting**
Written Examinations	2 hours	100
Practical Examinations		
Assessed essays/coursework	Tutor marked quiz 2 x computer based formative tests	0 0
18a. Final chronological assessment *(please see guidance*)	Written examination.	

19. Methods for providing 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

20. Outline Syllabus
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.
21. Illustrative Bibliography
"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
22. Learning outcomes *Successful completion of the module leads to the learning outcomes. The learning outcomes identify the knowledge, skills and attributes developed by the module.* *Learning Outcomes should be presented in the format "By the end of the module students should be able to..." using the table at the end of the module approval form:*

Resources
23. List any additional requirements and indicate the outcome of any discussions about these.
N/A

Approval	
24. Module leader's signature	Professor Michael Chappell
25. Date of approval	20 March 2018
26. Name of Approving Committee (include minute reference if applicable)	School of Engineering and WMG Course and Module Approval Committee Minute 151-17/18
27. Chair of Committee's signature	Professor Gillian Cooke
28. Head of Department(s) signature	Professor David Towers

Examination Information		
A1. Name of examiner (if different from module leader)		
A2. Indicate all available methods of assessment in the table below		
% Examined	**% Assessed by other methods**	**Length of examination paper**
100	0	2 hours
A3. Will this module be examined together with any other module (sectioned paper)? If so, please give details below.		
No.		
A4. How many papers will the module be examined by?	☒ 1 paper	☐ 2 papers
A5. When would you wish the exam take place (e.g. Jan, April, Summer)?	Summer	
A6. Is reading time required?	☐ Yes	☒ No
A7. Please specify any special exam timetable arrangements.		
N/A		
A8. Stationery requirements		
No. of Answer books?	2	
Graph paper?	Yes	
Calculator?	Yes	
Any other special stationery requirements (e.g. Data books, tables etc)?	Engineering Data Book	
A9. Type of examination paper		
Seen?	☐ Yes	☒ No
Open Book?	☐ Yes	☒ No
Restricted?	☐ Yes	☒ No
If restricted, please provide a list of permitted texts:		

LEARNING OUTCOMES		
(By the end of the module the student should be able to....)	**Which teaching and learning methods enable students to achieve this learning outcome? (reference activities in section 15)**	**Which summative assessment method(s) will measure the achievement of this learning outcome? (reference activities in section 16)**
Recognise and be able to apply mathematical tools and techniques to solve engineering based problems	Lectures Examples sheets Reading Tutorials Tests	Unseen examination
Recognise and be able to apply probabilistic and statistical tools and techniques to solve engineering based problems	Lectures Examples sheets Reading Tutorials Tests	Unseen examination
Make appropriate assumptions to simplify and thus model real-life Engineering problems.	Lectures Examples sheets Reading Tutorials Tests	Unseen examination
Analyse models using basic mathematical techniques including statistical and numerical techniques	Lectures Examples sheets Reading Tutorials Tests	Unseen examination