Anglia Ruskin University

Module Definition Form (MDF)

Module Code: EJ115012S	Version: 1 Date amended: 9th December 2005

1. Module Title: *maximum 100 characters*
Mathematics for Technology 1

2a. Module Leader:	**2b. Department:**	**2c. Faculty:**
S Cirstea	Computing and Technology	Science and Technology

3a. Level: *see guidance notes*	**3b. Module Type:** *see guidance notes*
1	Standard

4a. Credits: *see guidance notes*	**4b. Study Hours:** *see guidance notes*
15	150

5. Restrictions	
Pre-requisites:	
Co-requisites:	
Exclusions:	
Pathways to which this module is restricted:	

LEARNING, TEACHING AND ASSESSMENT INFORMATION (for inclusion in the Module Guide)

6a. Module Description: *200 – 300 words*

This module expands on the mathematical knowledge and techniques acquired in 'Techniques of Investigation', in order that elementary scientific and engineering problems may be solved. Matrices and the solution of simultaneous equations, using, for example, the inverse matrix and Gaussian elimination are introduced. Further techniques of algebraic manipulation are explored, for example, partial fractions. Problems involving elementary probability theory are solved. In the complex plane, de Moivre's theorem is introduced and used to find powers and roots. The techniques of calculus – differentiation and integration - are introduced. Numerical integration is explored.

This module will be assessed by a combination of coursework and formal examination.

6b. Outline Content:

- Matrices – addition and multiplication; determinants.
- Solution of simultaneous equations using Cramer's rule, the inverse matrix, Gaussian elimination.
- Complex numbers – polar, rectangular and exponential forms; de Moivre's theorem and applications – powers and roots.
- Partial fractions.
- Hyperbolic and inverse trigonometric functions.
- Differential calculus – the differential coefficients of polynomial, trigonometric, exponential and logarithmic functions; differentiation of a product and quotient and function of a function; finding maxima, minima and points of inflexion; differentiation of implicit, hyperbolic and inverse trigonometric functions; applications of differentiation.
- Binomial, Maclaurin and Taylor series.
- Elementary probability theory.
- The concepts and standard techniques of integration – parts, substitution, partial fractions.
- Numerical integration – trapezoidal, mid-ordinate and Simpson's rules.

6c. Key Texts/Literature:

Stroud, K.A. and Booth D.J. (2007) "Engineering Mathematics", 6th edition, Basingstoke: Palgrave Macmillan.
Croft A., Davison R. & Hargreaves M. (2000) "Engineering Mathematics", Prentice Hall
Croft A. & Davison R. (2008) "Mathematics for Engineers: A modern interactive approach", Prentice Hall

6d. Specialist Learning Resources:
Module guide

7. Learning Outcomes (threshold standards):	
	On successful completion of this module the student will be expected to be able to:
Knowledge and understanding	1. Apply mathematical methods to solve equations in the real and complex planes. 2. Understands the principles of calculus and is able to differentiate and integrate most common functions.
Intellectual, practical, affective and transferable skills	3. Solve scientific and technologically based problems that may involve the application of calculus, manipulation of common functions and algebraic manipulation in the complex plane.

8. Learning Activities

Learning Activities	Hours	Learning Outcomes	Additional Comments (including details of use of web-CT)
Teacher managed learning:	48	All	
Student managed learning:	102	All	
TOTAL	150		

9. Assessment

Assessment Method	% contribution to module mark or P/F	Learning Outcomes
Two in-class 30-minute tests (weeks 5 and 10)	30	All
Examination (2 hours)	70	All

In order to pass this module, students are required to achieve an overall mark of 40%

In addition, students are required to (a) for each element of fine graded assessment listed above, achieve a minimum mark of 30% (or higher - see Module Guide) and (b) pass any pass/fail elements

OTHER TECHNICAL DETAILS

10. Delivery of the Module *Please delete as appropriate*

Delivery	*This module is delivered over…*	*Yes or No?*	*Indicate which by deleting as appropriate*	
1	**…a single semester**	Y	~~Semester 1~~	Semester 2

11. Learning Activities – further details

Learning Activities	Details of duration and frequency of learning activities
Teacher managed learning:	One two-hour lecture and one two-hour tutorial per week.
Student managed learning:	102 hours

12. Module Assessment – further details

Method	Length/duration	Fine graded (FG) or pass/fail (PF)	Minimum Qualifying Mark *see guidance notes*	Comments
In-class tests	2 X 30 minutes	FG	30 %	(weeks 5 and 10)
Examination	2 hours	FG	30 %	

13. Subject: *see guidance notes*	