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Title: Foundation Mathematics for Engineering and Technology 2  
Status: Definitive  
Code: **3503USST** (126426)  
Version Start Date: 01-08-2021  
Owning School/Faculty: Engineering  
Teaching School/Faculty: University of Shanghai For Science and Technology

Team	Leader
Ian Jarman	Y

**Academic Level:** FHEQ3      **Credit Value:** 20      **Total Delivered Hours:** 46  
**Total Learning Hours:** 200      **Private Study:** 154

### Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Tutorial	22
Workshop	22

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	AS1	Continual Assessment	30	
Exam	AS2	Final Examination	70	2

### Aims

*This module aims to build upon the material covered in Mathematics 1 by exploring more advanced topics in Mathematics. This includes an introduction to elementary techniques in Calculus. After completing this module, students should be prepared with the prerequisite mathematical ability required to embark upon a BEng or BSc degree programme in an engineering or technology subject.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Apply basic trigonometric formula to solve problems applicable to engineering and technology
- 2 Use differentiation to solve problems relevant to engineering and technology
- 3 Apply techniques of integration in problems relevant to engineering and technology
- 4 Use techniques of numerical integration in solving problems applicable to engineering and technology.

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Continual Assessment	1	2	3	4
Final Examination	1	2	3	4

## Outline Syllabus

*The list below provides an indicative list of topics which will be covered in this module:*

*Trigonometry:*

- *Measurement of angles, degrees, radians*
- *Right angle triangles, Pythagoras, sine, cosine, tangent*
- *Non right angled triangles, sine rule, cosine rule*
- *Graphs of trigonometric functions*
- *Inverse trigonometric functions*
- *Simple trigonometric equations*
- *Trigonometric identities*
- *Properties of trigonometric functions, period, frequency, amplitude, phase angle.*

*Differentiation:*

- *Slopes, rates of change.*
- *Differentiation of simple explicit functions: powers, trigonometric functions, exponential functions, logarithmic functions.*
- *Turning points of curves.*
- *Applications of maxima and minima.*

*Integration:*

- *Integration defined as anti-differentiation. Indefinite integrals.*
- *Integration of elementary functions: powers, trigonometric functions, exponential functions, logarithmic functions.*
- *Definite integration and applications e.g. area under a curve.*

- *Numerical integration: Trapezium Rule, Simpson's rule*

### **Learning Activities**

Learning will primarily be via a Computer Aided Learning package, supported by tutorials and workshops

### **Notes**

This module covers the fundamental mathematical skills needed for further study in engineering and technology subjects, and will include extensive practice problem solving, assessed regularly to support a structured approach to learning.