**CET005**INTRODUCTORY ENGINEERING MATHEMATICS

**Scheme**

Undergraduate

**Department**

Comp. Eng. & Tech (D)

**Level**

Level 0

**Tutor**

Derek Dixon

**Credits**

20

**Module Board**

Computing

**Description**

TITLE: Introductory Engineering Mathematics   
CODE: CET005  
CREDITS: 20  
LEVEL: Level 0   
FACULTY: FAS  
MODULE BOARD: Level zero  
PRE-REQUISITES: None  
CO-REQUISITES: None  
LEARNING HOURS: 200  
  
LEARNING OUTCOMES  
Upon successful completion of this module, students will have demonstrated  
  
Knowledge  
Students will have a basic understanding of:  
1. different algebraic methods.  
2. elementary trigonometry and its applications.  
3. calculus concepts and applications.  
  
Skills  
  
And the ability to:  
4. analyse and solve problems using algebraic methods.  
5. evaluate and model engineering situations using elementary trigonometric ratios and formulae  
6. apply calculus concepts to engineering scenarios.  
  
  
  
CONTENT SYNOPSIS ? (NB: new modules must have an amplified content synopsis)  
  
Algebraic Methods: Laws of algebra, explanation and application of the (BODMAS) rationale to engineering equations. Solving and rearranging and engineering related equations to make different terms the subject of the equation by application of basic techniques such as removing brackets to expand/simplify equations, factorizing equations. The use of indices to simplify the expression of an equation and the solution of engineering equations which contain indices. The application and solution of simultaneous equations in an engineering context. Solution of quadratic equations by factorising, application of the formula and by graphical means.  
  
Elementary trigonometry: Introduction to basic trigonometric ratios and their definitions. Application of the basic trigonometric ratios of sine, cosine and tangent to model, represent and solve engineering problems and situations. An introduction to the general angle, sine and cosine rules. Application of the general angle, sine and cosine rules to represent and model engineering scenarios and to solve engineering based problems.   
Differential calculus: An introduction to differential calculus and its application in engineering scenarios to model and represent rates of change of functions. The application of differential calculus to determine the gradient (slope) of a graph. Introduction to simple rules of differentiation in relation to dealing with constants and functions. Familiarisation with and application of the list of standard derivatives in differentiating basic polynomial equations.   
  
  
TEACHING AND LEARNING METHODS:  
Scheduled activities Independent study Placement Total hours  
Hours Detail Hours Detail Hours Detail   
60 Lectorials  
80 Private study (library and on line), directed reading, revision, preparation of formative work and summative assessment mid-module assignment. 0 140  
5 Formative Assessment 10 Private study activities working towards completion of formative assessment work 15  
5 Summative Assessment 40 Private study (library and on line), revision for summative assessment exam 45  
Total 200  
  
  
ASSESSMENT METHODS  
(Please ensure that the sequence numbering of the assessments is in the correct chronological order for the module, as this may affect funding.)  
  
Required For KIS return to HESA  
Seq. Element  
(1) % of module assessment weighting  
(2) Summary  
(3) Pass Mark LO Written exam ? central timetable  
(% of the element)  
Written exam ? local timetable  
(% of the element) Coursework  
(% of the element) Practical  
(% of the element)  
%  
(4) Type %  
(5) Type %  
(6) Type %  
(7) Type  
001 Assignment 30 Written Assignment \* 1,4, 0 \_ 0 \_ 30 Assignment 0 \_   
002 Assignment 30 Written assignment \* 2,5 0 \_ 0 \_ 30 Assignment 0 \_  
003 Exam 40 End of Module Exam \* 1,3, 4.6 0 \_ 100 Exam 0 \_ 0 \_  
\* Only populate if there is an approved programme specific regulation OR if the assessment is pass/fail   
  
(If the Pass Mark differs from the university regulations there must be a related programme specific regulation approved.)  
  
Assessment 001 assignment based upon engineering situations modeling algebraic methods, assessing learning outcomes 1 and 4 and contributing 30 % of the final module mark. This will consist of, some detailed calculations and evaluation of simulations.  
Assessment 002 assignment based upon engineering situations modeling trigonometric methods, assessing learning outcomes 2 and 5 and contributing 30 % of the final module mark. This will consist of, some detailed calculations and evaluation of simulations..  
Assessment 003 one end of module exam (duration 2 hrs) assessed by staff testing learning outcomes 1, 3, 4, and 6 contributing 40% of the final module mark. This will consist of appropriate calculations.  
  
INDICATIVE READING LIST ? (NB: New modules must have an extended reading list)  
Bird, J,O. (2010) Higher Engineering Mathematics, 6th Edition Newnes, Oxford.  
  
Bird, J,O. (2010) Basic Engineering Mathematics 5th Edition Newnes, Oxford.  
  
Bird, J,O. (2010) Engineering Mathematics, 6th Edition Newnes, Oxford.  
  
Breach, M. (2011) Fundamental Maths: For Engineering and Science Palgrave Macmillan, Basingstoke.  
  
Croft, A.; Hargreaves, M.; Davison, R. and Flint, J. (2012) Engineering Mathematics: A Foundation for Electronic, Electrical, Communications and Systems Engineers 4th Edition Prentice Hall; Harlow  
  
Croft, A. and Davison, R. (2006) Foundation Maths 4th Edition Pearson Education. Prentice Hall  
  
Glyn, J (1999) Advanced Modern Engineering Mathematics ? 2nd Edition, Addison-Wesley, Harlow   
  
James, G.; Burley, D.; Clements, R.; Dyke P.; Searl, J.; Steele, N. and Wright, J.;   
(2010) Advanced Modern Engineering Mathematics, 3rd Edition Prentice. Hall, Harlow.  
  
Mustoe, L. R. (1997) Engineering maths. Addison-Wesley, Harlow.  
  
Stroud K. A. and Booth, D.J. (2007) Engineering Mathematics, 6th Edition. Palgrave Macmillan, Basingstoke.   
  
  
PROGRAMMES USING THIS MODULE AS CORE/OPTION:   
(a) BEng(Hons) Automotive Engineering (Level zero)   
(b) BEng(Hons) Electronic and Electrical Engineering (Level zero)  
(c) BEng(Hons) Mechanical Engineering (Level zero)  
  
  
  
Is the programme delivered On Campus or Off campus (please delete, as appropriate):   
  
On campus / Off campus  
College(s): N/A  
  
Work based learning: Yes/No  
  
Professional Accreditation: Yes/ No  
(If yes, by whom and what conditions if any are specific to the module?)  
  
MODULE LEADER   
Dr. Alan Fell ext. 2870 University of Sunderland alan.fell@sunderland.ac.uk  
  
LEAD DELIVERER  
Dr. Alan Fell ext. 2870 University of Sunderland alan.fell@sunderland.ac.uk  
  
  
JACS Code: G160

**Assessments**

EXAM FINAL: Exam (40%)

COURSEWORK: Coursework 1 (30%)

COURSEWORK: Coursework 2 (30%)

**Availability**

A: Semester 2 2013/4 Sunderland

A: Semester 2 2014/5 Sunderland