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| Short Title: | Technical Mathematics 1 APPROVED |
| Full Title: | Technical Mathematics 1 |
| Module Code: | MATH H1074 |
| Credits: | 5 |
| Field of Study: | Mechanics and metal work |
| Module Delivered in | 2 programme(s) |
| Reviewed By: | DIARMUID RUSH |
| Module Author: | Ciaran O Sullivan |
| Module Description: | The first aim of Technical Mathematics 1 is a thorough revision and consolidation of key numeracy and algebra skills, including the effective use of a calculator. The second aim of Technical Mathematics 1 is to support other engineering modules in year 1 by covering unit conversion, manipulation of engineering formulae, linear laws, the study of right angled triangles and complex numbers. The third aim of the module is to introduce students to the use of software applications in the presentation and manipulation of engineering data. |

| Learning Outcomes | |
|---|---|
| <i>On successful completion of this module the learner will be able to:</i> | |
| LO1 | Calculate numerical expressions accurately involving fractions and precedence. |
| LO2 | Calculate and simplify numerical expressions involving scientific and engineering notation. |
| LO3 | Understand and calculate estimates of error |
| LO4 | Use a calculator in scientific and engineering mode. |
| LO5 | Round a number to significant figures or decimal places. |
| LO6 | Perform unit conversion, using appropriate tools. |
| LO7 | Use the standard mathematical connectives and expressions accurately. |
| LO8 | Use the rules of indices to simplify numerical and algebraic expressions, in particular in the context of simplification of units. |
| LO9 | Parse expressions accurately and perform standard algebraic operations on them. |
| LO10 | Solve single linear and quadratic equations and pairs of linear equations. |
| LO11 | Express word problems involving proportion as equations and solve. |
| LO12 | Find the equation of a line given two pieces of information. |
| LO13 | Plotting charts and graphs from experimental data. |
| LO14 | Plot linear data, draw inferences, find the equation of the line of best fit and use appropriate software (e.g. Excel) to plot linear data and find its equation. |
| LO15 | Safely backup electronic data by managing files and folders using a file management system. |
| LO16 | Use common Mathematical, Engineering and Financial formulae in a spreadsheet. |
| LO17 | Convert between degrees and radians. |
| LO18 | Apply the basic techniques of trigonometry to solve problems in engineering involving right angled triangles. |
| LO19 | Perform algebra involving complex numbers. |
| LO20 | Convert between Cartesian and Polar form using a calculator. |

Module Content & Assessment

| Course Work | | | | |
|------------------------|--|--------------------------|-------------------|------------------------|
| <i>Assessment Type</i> | <i>Assessment Description</i> | <i>Outcome addressed</i> | <i>% of total</i> | <i>Assessment Date</i> |
| Other | Diagnostic test to identify for students key areas of consolidation | 1,2,3,5,6,7,8,9,10 | 1.00 | Week 1 |
| Continuous Assessment | High threshold criterion referenced test at the end of arithmetic and algebra section of course. | 1,2,3,5,7,8,9,10 | 19.00 | Week 7 |
| Assignment | Assignment to collect, plot and intepret some linear data through Excel and to plot basic engineering functions. | 12,13,14,15,16 | 20.00 | Week 10 |

| End of Module Formal Examination | | | | |
|---|-----------------------------------|--|-------------------|------------------------|
| <i>Assessment Type</i> | <i>Assessment Description</i> | <i>Outcome addressed</i> | <i>% of total</i> | <i>Assessment Date</i> |
| Formal Exam | End-of-Semester Final Examination | 1,2,3,4,5,6,7,8,9,10,11,12,13,14,17,18,19,20 | 60.00 | End-of-Semester |

TU Dublin – Tallaght Campus reserves the right to alter the nature and timings of assessment

Module Workload

| Workload: Full Time | | | | |
|-------------------------------|---|--------------|------------------|--|
| <i>Workload Type</i> | <i>Workload Description</i> | <i>Hours</i> | <i>Frequency</i> | <i>Average Weekly Learner Workload</i> |
| Lecture | No Description | 3.00 | Every Week | 3.00 |
| Laboratories | Computer labs in Excel and GeoGebra | 1.00 | Every Week | 1.00 |
| Independent Learning | Review of lecture material between lectures, completion of problem sheet questions, computer lab re-inforcement. Synthesis of course material ahead of final semester exam. | 3.00 | Every Week | 3.00 |
| Total Weekly Learner Workload | | | | 7.00 |
| Total Weekly Contact Hours | | | | 4.00 |

This module has no Part Time workload.

Module Resources

Required Book Resources

Anthony Croft, Robert Davison 2016, *Foundation Maths*, 6th ed Ed. [ISBN: 1292095172]

Semester 1 School of Engineering ITT Mathematics Workbook, Mathematics

Recommended Book Resources

Kuldeep Singh, *Engineering Mathematics Through Applications*, 2nd Ed., Palgrave MacMillan [ISBN: 9780230274792]

Dexter J. Booth, 2008, *Engineering Mathematics*, 6th ed Ed., Palgrave Macmillan, [ISBN: ISBN 9781403942463]

This module does not have any article/paper resources

Other Resources

Website: GeoGebra

<https://www.geogebra.org/>

Module Delivered in

| Programme Code | Programme | Semester | Delivery |
|----------------|---|----------|-----------|
| TA_EAEEE_D | Bachelor of Engineering in Sustainable Energy and Environmental Engineering | 1 | Mandatory |
| TA_EMECH_C | Higher Certificate in Engineering in Mechanical Engineering | 1 | Mandatory |