

MATH6019: Technological Maths 2 & Maple

Module Details

Module Code:	MATH6019
Title:	Technological Maths 2 & Maple APPROVED
Long Title:	Technological Maths 2 & Maple
NFQ Level:	Fundamental
Valid From:	Semester 1 - 2019/20 (September 2019)
Duration:	1 Semester
Credits:	5
Field of Study:	4610 - Mathematics
Module Delivered in:	9 programme(s)
Module Description:	This module introduces students to differential and integral calculus. Maple is used to explore the topics.

Learning Outcomes

On successful completion of this module the learner will be able to:

#	Learning Outcome Description
LO1	Differentiate various functions and apply differentiation to tangents, rates of change, and optimisation.
LO2	Integrate functions using a table of standard integrals and by substitution.
LO3	Apply integration techniques to problems relevant to student discipline.
LO4	Formulate and solve simple ordinary differential equations.
LO5	Use computer software to explore calculus.

Dependencies

Module Recommendations

13601	MATH6019	Technological Maths 2 & Maple
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Incompatible Modules

No incompatible modules listed

Co-requisite Modules

No Co-requisite modules listed

Requirements

No requirements listed

Indicative Content

Differentiation

Introduction to limits. Definition and graphical interpretation of a derivative. Differentiation of common functions, product, quotient, chain rules. Applications of differentiation.

Integration

Integration as anti-differentiation. Standard integrals. Integration by substitution. Integration as summation. Definite integral and its significance. Applications of definite integral. Solution of simple ordinary differential equations.

Mathematical Software

Introduction to mathematical software packages (e.g. Maple). Exploration of calculus and its applications. Calculus package.

Module Content & Assessment

Assessment Breakdown	%
Coursework	40.00%
End of Module Formal Examination	60.00%

Assessments

Coursework			
Assessment Type	Short Answer Questions	% of Total Mark	15
Timing	Week 5	Learning Outcomes	1
Assessment Description Classroom Assessment			
Assessment Type	Short Answer Questions	% of Total Mark	15
Timing	Week 10	Learning Outcomes	2,3
Assessment Description Classroom Assessment			
Assessment Type	Practical/Skills Evaluation	% of Total Mark	10
Timing	Week 12	Learning Outcomes	5
Assessment Description Openbook practical lab exam			
End of Module Formal Examination			
Assessment Type	Formal Exam	% of Total Mark	60
Timing	End-of-Semester	Learning Outcomes	1,2,3,4
Assessment Description End-of-Semester Final Examination			
Reassessment Requirement			
Repeat examination			
Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.			

Module Workload

Workload: Full Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Formal lecture	Every Week	3.00	3
Tutorial	Contact	Based on exercise sheets	Every Week	1.00	1
Lab	Contact	Computer Software Laboratory	Every Week	1.00	1
Independent & Directed Learning (Non-contact)	Non Contact	Worksheets	Every Week	1.00	1
Independent & Directed Learning (Non-contact)	Non Contact	Reading and Skills Practice	Every Week	1.00	1
Total Hours					7.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					5.00

Workload: Part Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Formal Lecture	Every Week	2.00	2
Tutorial	Contact	Tutorial	Every Week	1.00	1
Lab	Contact	Maple Lab	Every Second Week	0.50	1
Independent & Directed Learning (Non-contact)	Non Contact	Set worksheets with feedback	Every Week	1.00	1
Independent & Directed Learning (Non-contact)	Non Contact	Reading and Skills Practice	Every Week	2.50	2.5
Total Hours					7.50
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					3.50

Module Resources

Recommended Book Resources	
John Bird. (2017), Engineering Mathematics, 8th. Routledge, Oxon, [ISBN: 9781138673595].	
Supplementary Book Resources	
K.A. Stroud. (2013), Engineering Mathematics, 7th. MacMillan, [ISBN: 9781137031204].	
This module does not have any article/paper resources	
Other Resources	
Website, CIT Maths Online. http://mathematics.cit.ie/online Website, Wolfram Alpha. https://www.wolframalpha.com/	

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_SCHQA_8	Bachelor of Science (Honours) in Analytical Chemistry with Quality Assurance	-1	Mandatory
CR_SESST_8	Bachelor of Science (Honours) in Environmental Science and Sustainable Technology	-1	Mandatory
CR_SINEN_8	Bachelor of Science (Honours) in Instrument Engineering	-1	Mandatory
CR_SCHEM_7	Bachelor of Science in Analytical and Pharmaceutical Chemistry	-1	Mandatory
CR_SPHYS_7	Bachelor of Science in Applied Physics and Instrumentation	-1	Mandatory
CR_SPHYS_6	Higher Certificate in Science in Applied Physics and Instrumentation	-1	Mandatory
CR_SCHEM_6	Higher Certificate in Science in Chemistry	-1	Mandatory
CR_SOMNI_7	Physical Sciences (Common Entry)	-1	Mandatory
CR_SOMNI_8	Physical Sciences (Common Entry)	-1	Mandatory