



<b>Title:</b>	Technological Maths 2 & Maple <b>APPROVED</b>
<b>Long Title:</b>	Technological Maths 2 & Maple
<b>Module Code:</b>	MATH6019
<b>Credits:</b>	5
<b>NFQ Level:</b>	Fundamental
<b>Field of Study:</b>	Mathematics
<b>Valid From:</b>	Semester 1 - 2009/10 ( September 2009 )
<b>Module Delivered in</b>	<a href="#">9 programme(s)</a>
<b>Module Coordinator:</b>	David Goulding
<b>Module Author:</b>	
<b>Module Description:</b>	This module introduces students to differential and integral calculus. Maple is used to explore the topics.
<b>Learning Outcomes</b>	
<i>On successful completion of this module the learner will be able to:</i>	
LO1	Differentiate various functions and apply differentiation to tangents, rates of change, and optimization.
LO2	Integrate functions using a table of standard integrals and by substitution.
LO3	Apply integration to problems relevant to student discipline.
LO4	Formulate and solve simple differential equations.
LO5	Use Maple to explore calculus.
<b>Pre-requisite learning</b>	
<b>Module Recommendations</b> <i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named CIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i>	
No recommendations listed	
<b>Incompatible Modules</b> <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module. You may not earn additional credit for the same learning and therefore you may not enrol in this module if you have successfully completed any modules in the incompatible list.</i>	
No incompatible modules listed	
<b>Co-requisite Modules</b>	
No Co-requisite modules listed	
<b>Requirements</b> <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.</i>	
No requirements listed	
<b>Co-requisites</b>	
No Co Requisites listed	

**Module Content & Assessment**

**Indicative Content**

**Differentiation**

Introduction to limits. Definition and graphical interpretation of a derivative. Differentiation of common functions, product, quotient, chain rules. Application 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 differential equations.

**Maple**

Introduction to Maple. Exploration of calculus and its applications. Calculus package.

**Assessment Breakdown**

	%
Course Work	40.00%
End of Module Formal Examination	60.00%

**Course Work**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Openbook practical lab exam	5	10.0	Week 12
Short Answer Questions	Classroom Assessment	1	15.0	Week 5
Short Answer Questions	Classroom Assessment	2,3	15.0	Week 10

**End of Module Formal Examination**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	End-of-Semester Final Examination	1,2,3,4	60.0	End-of-Semester

**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.

The institute reserves the right to alter the nature and timings of assessment

**Module Workload**

<b>Workload: Full Time</b>				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Formal lecture	4.0	Every Week	4.00
Lab	Maple laboratory	1.0	Every Week	1.00
Independent & Directed Learning (Non-contact)	Worksheets	1.0	Every Week	1.00
Independent & Directed Learning (Non-contact)	No Description	1.0	Every Week	1.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				5.00

<b>Workload: Part Time</b>				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Formal Lecture	2.0	Every Week	2.00
Independent & Directed Learning (Non-contact)	Set worksheets with feedback	1.0	Every Week	1.00
Tutorial	Tutorial	1.0	Every Second Week	0.50
Lab	Maple Lab	2.0	Every Month	0.50
Independent & Directed Learning (Non-contact)	Reading and Skills Practice	3.0	Every Week	3.00
Total Hours				9.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				3.00

<b>Module Resources</b>
<i>Recommended Book Resources</i>
• <b>Stroud K A 2007, <i>Engineering Mathematics</i>, 6th Edition Ed., MacMillan [ISBN: 9781403942463]</b>
<i>Supplementary Book Resources</i>
• <b>John Bird 2007, <i>Engineering Mathematics</i>, 5th Edition Ed., Elsevier Science &amp; Technology [ISBN: 978-0-7506-8555-9]</b>
<i>This module does not have any article/paper resources</i>
<i>Other Resources</i>
• <b>Website: <a href="http://mathsonline.cit.ie">http://mathsonline.cit.ie</a></b>

**Module Delivered in**

<b>Programme Code</b>	<b>Programme</b>	<b>Semester</b>	<b>Delivery</b>
CR_SCHQA_8	<a href="#"><u>Bachelor of Science (Honours) in Analytical Chemistry with Quality Assurance</u></a>	2	Mandatory
CR_SESST_8	<a href="#"><u>Bachelor of Science (Honours) in Environmental Science and Sustainable Technology</u></a>	2	Mandatory
CR_SINEN_8	<a href="#"><u>Bachelor of Science (Honours) in Instrument Engineering</u></a>	2	Mandatory
CR_SCHEM_7	<a href="#"><u>Bachelor of Science in Analytical and Pharmaceutical Chemistry</u></a>	2	Mandatory
CR_SPHYS_7	<a href="#"><u>Bachelor of Science in Applied Physics and Instrumentation</u></a>	2	Mandatory
CR_SPHYS_6	<a href="#"><u>Higher Certificate in Science in Applied Physics and Instrumentation</u></a>	2	Mandatory
CR_SCHEM_6	<a href="#"><u>Higher Certificate in Science in Chemistry</u></a>	2	Mandatory
CR_SOMNI_8	<a href="#"><u>Physical Sciences (Common Entry)</u></a>	2	Mandatory
CR_SOMNI_7	<a href="#"><u>Physical Sciences (Common Entry)</u></a>	2	Mandatory