

Full Title:	Mathematics 2
Language of Instruction:	English
Module Code:	MATH I7009
Credits:	5
Valid From:	Semester 1 - 2014/15 (September 2014)
Module Delivered in	1 programme(s)
Module Description:	The Differentiation and Integration of functions of one variable and their application to the solution of ordinary differential equations
Learning Outcomes:	
<i>On successful completion of this module the learner should be able to</i>	
<ol style="list-style-type: none"> 1. Differentiate functions occurring in Civil Engineering 2. Integrate functions occurring in Civil Engineering 3. Apply Differentiation and Integration to the calculation of a wide range of quantities 4. Set up and solve mathematical models expressed in terms of first and second order differential equations 	

Module Content & Assessment

Indicative Content

Differentiation

Slope , Rate of Change, Standard Derivatives, Differentiation Rules(Product, Quotient, Chain), Implicit Differentiation, Extreme Points, Curve Sketching , Newton - Raphson Method

Integration

Fundamental theorem of the calculus, Standard Integrations, Integration techniques(Substitution, Partial Fractions, Parts), Numerical Integration, Areas, Volumes, Arc length, Average and Root Mean square, Centroids, Moments of Inertia

Differential Equations

Mathematical Models in Engineering, First Order Differential Equations, Separation of variables , Integrating factor, Second order Equations , Initial and Boundary value problems, Application to problems in Structural Mechanics

Assessment Breakdown

	%
Course Work	20.00%
End of Module Formal Examination	80.00%

Full Time

Course Work

Assessment Type	Assessment Description	Outcome addressed	% of total	Marks Out Of	Pass Marks	Assessment Date	Duration
Continuous Assessment	Ten homework exercises	1,2,3,4	10.00	0	0	n/a	0
Continuous Assessment	Two Class Tests	1,2,3,4	10.00	0	0	n/a	60

No Project

No Practical

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Marks Out Of	Pass Marks	Assessment Date	Duration
Formal Exam	End-of-Semester Final Examination	1,2,3,4	80.00	0	0	End-of-Semester	0

Reassessment Requirement

A 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.

DKIT reserves the right to alter the nature and timings of assessment

Module Workload & Resources

Workload: Full Time

Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Class Room	3.00	Every Week	3.00
Tutorial	Class Room	1.00	Every Week	1.00
Directed Reading	No Description	2.00	Every Week	2.00
Independent Study	No Description	2.00	Every Week	2.00
Total Weekly Learner Workload				8.00
Total Weekly Contact Hours				4.00

This course has no Part Time workload.

Resources

Recommended Book Resources

- K. Stroud 2004, *Engineering Mathematics*, 6 Ed., Palgrave MacMillan**
- J. Bird 2003, *Engineering Mathematics*, Newnes**
- Glyn James et al 2007, *Modern Engineering Mathematics*, 4 Ed., Prentice Hall**

This module does not have any article/paper resources

Other Resources

Website: *Engineering Mathematics*
<http://www.steps.ie>

Website: *Mathematical Tutorials*
<http://www.mathcentre.ac.uk>

Website: *Video Lectures*
<http://www.khanacademy.org>

Module Delivered in

Programme Code	Programme	Semester	Delivery
DK_ECIVL_7	Bachelor of Engineering in Civil Engineering	3	Mandatory