

Module code	SM-2201		
Module Title	Ordinary Differential Equation and its Applications		
Degree/Diploma	Bachelor of Science (Mathematics)		
Type of Module	Major Core		
Modular Credits	4	Total student Workload	10 hours/week
		Contact hours	4 hours/week
Prerequisite	SM-1201 Mathematical Methods for the Sciences		
Anti-requisite	None		
Aims			
To introduce students to many applications of <i>ordinary</i> differential equations that relate to other disciplines in the social, medical, biological, physical sciences and other areas.			
Learning Outcomes			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order :	30%	<ul style="list-style-type: none"> - describe the difference of Ordinary and Partial Differential Equation. - describe the mathematical terms frequently used (for example: <i>behaviour</i> of the solutions of differential equations) and the important Theorems. - describe the graphical representation of solutions of Ordinary Differential Equation (ODE) 	
Middle order :	60%	<ul style="list-style-type: none"> - mastering the various methodologies of ODE - Skilful in acknowledging and identifying which method is suitable for the various types of ODE. - understand the applications of ODE - mastering Laplace Transform method as an alternative to analytical method 	
Higher order:	10%	<ul style="list-style-type: none"> - able to use the software <i>Mathematica</i> to solve ODE and to double check the solutions found by solving with various analytical methods. 	
Module Contents			
<p>Classification of differential Equations and Graphical representation of the solutions of ordinary Differential Equations (ODE).</p> <ul style="list-style-type: none"> - Solving first- order ODE. Applications of first order ODE. -Linear second order and higher ODE. Applications of second order ODE. -Laplace transform: definition and properties, inverse transform, initial value problems, step functions and delayed functions. - Use of mathematical computer software (Mathematica) 			
Assessment	Formative assessment	1 Weekly Tutorial and feedback.	
	Summative assessment	Examination: 60% Coursework: 40% - 2 class tests (40%)	