Module code	SM-2311
Module Title	Engineering Mathematics
Degree/Diploma	Bachelor of Science (Mathematics)
Type of Module	Major Option
Modular Credits	4

Modular Credits	4	**Total student Workload**	10	hours/week
		Contact hours	4	hours/week

Prerequisite	SM-1202 Advanced Mathematical Methods for the Sciences
Anti-requisite	None

Aims

This module introduces students studying for the Bachelor of Engineering degree to an extended range of methods and techniques for solving problems in electrical, mechanical and chemical engineering, building on the foundation of the basic concepts of calculus and linear algebra taught in the first-year mathematics modules SM-1201 and SM-1202. After completing this module, students will be able to use matrix methods to solve systems of linear algebraic equations, use Laplace transform and matrix methods to solve a range of simple systems of linear ordinary differential equations, evaluate a standard set of improper and multiple integrals, solve simple types of partial differential equations, and represent periodic functions in terms of their Fourier series.

Learning Outcomes

On successful completion of this module, a student will be expected to be able to:

Lower order :	30%	- describe the various Engineering Mathematics techniques
Middle order :	60%	- formulate and solve various Engineering Mathematics problems
Higher order:	10%	- interpret the results of various calculations - work independently and in a team

Module Contents

- Ordinary Differential Equations. Second-order ODEs with constant coefficients. Application to electrical and mechanical oscillations.
- Improper Integrals. Comparison test for infinite integrals. Definition and properties of Laplace transform. Tables of standard transforms. Inverse transforms. Convolution theorem. Application to differential equations and integral equations of simple type.
- Matrices.
- Systems of Differential Equations.
- Partial Differential Equations.
- Multiple Integration.
- Fourier Series.

Assessment	Formative assessment	Tutorial and feedback.	
	Summative assessment	Examination: 60%	
		Coursework: 40% - 4 tests (40%)	