

Module Code	MA1123	Title	Mathematical Methods			
Credits	03	Hours/Week	Lectures	03	Prerequisites	MA1013
			Lab/Tutorial	01		
<u>Learning Outcomes</u>						
<p>At the end of this module the student should be able to</p> <ul style="list-style-type: none"> • Solve first order non-linear ordinary differential equations. • Solve initial value problems involving second order linear ordinary differential equations. • Apply multivariate calculus to solve simple engineering problems. • Apply statistical skills in engineering problems. • Use probability distributions for decision making in engineering. 						
<u>Outline Syllabus</u>						
<u>Ordinary Differential Equations</u>						
<ul style="list-style-type: none"> • Orthogonal trajectories • First order ordinary differential equations: Variable separable, homogeneous, linear and exact. • Second order ordinary differential equations, reducible forms. 						
<u>Multivariate Calculus</u>						
<ul style="list-style-type: none"> • Multivariable functions, partial differentiation, chain rule, directional derivatives. • Maxima and minima, Lagrange multipliers. • Taylor series expansion of multivariate functions. 						
<u>Basic Probability and Statistics</u>						
<ul style="list-style-type: none"> • Conditional probability, Bayes' theorem. • Discrete and continuous random variables. • Probability and cumulative distribution functions, Joint distribution functions. • Binomial, Poisson and Normal distributions and their applications. • Basic statistical indicators in data analysis, correlation coefficients. • Introduction of Minitab statistical software. 						

Note: Only for TLM students