

No	Information of every subject	
1	Unit name:	Engineering Mathematics (V)
2	Code:	EM -31005
3	Classification:	Supporting Subject
4	Credit value:	4.5
5	Semester/ Year Offered:	1/3
6	Pre-requisite:	
7	Mode of delivery:	Lecture, Tutorial, Oral
8	Assessment system and breakdown of marks:	
	Test	15%
	Final Examination	35%
9	Academic staff teaching unit:	Engineering Mathematics
10	<p>Course Outcomes of unit:</p> <p>In this course, students will be able to</p> <ul style="list-style-type: none"> • solve some types of first order differential equations • solve linear ODEs of second order which is important engineering application • solve extend the concepts and methods of second order linear ODEs • solve the differential equations by Laplace Transforms • calculate the series of the function by using Fourier Series, Integrals and Transforms 	
11	<p>Synopsis of unit:</p> <p>The course introduces students to First-Order Ordinary Differential Equations, Second-Order Linear Ordinary Differential Equations, Higher Order Linear Ordinary Differential Equations, Laplace Transforms, Fourier Series, Integrals, and Transform.</p>	
12	<p>Topic:</p> <ol style="list-style-type: none"> 1. First-Order Ordinary Differential Equations <ul style="list-style-type: none"> - Basic Concepts, Modeling - Separable Ordinary Differential Equations, Modeling - Exact Ordinary Differential Equations. Integrating Factors - Linear Ordinary Differential Equations, Bernoulli Equation, Population Dynamics 2. Second-Order Linear Ordinary Differential Equations <ul style="list-style-type: none"> - Homogenous Linear Ordinary Differential Equations of Second Order - Homogeneous Linear Ordinary Differential Equations with Constant Coefficients - Differential Operators. Optional - Euler- Cauchy Equations 	

	<ul style="list-style-type: none"> - Existence and Uniqueness of Solutions. Wronskian - Nonhomogeneous Ordinary Differential Equations - Solution by Variation of Parameters <p>3. Higher Order Linear Ordinary Differential Equations</p> <ul style="list-style-type: none"> - Homogenous Linear Ordinary Differential Equations - Homogenous Linear Ordinary Differential Equations with Constant Coefficients - Nonhomogeneous Linear Ordinary Differential Equations <p>6. Laplace Transforms</p> <ul style="list-style-type: none"> - Laplace Transform. Inverse Transform. Linearity. s-Shifting - Transforms of Derivatives and Integrals. Ordinary Differential Equations - Unit Step Function.(Heaviside Function), Second Shifting Theorem (t-Shifting) - Convolution. Integral Equations <p>11. Fourier Analysis</p> <ul style="list-style-type: none"> - Fourier Series - Arbitrary period. Even and Odd Functions. Half-Range Expansions - Forced Oscillations - Approximation by Trigonometric Polynomials
14	<p>Main references:</p> <ul style="list-style-type: none"> - Advanced Engineering Mathematics (10th Edition, ERWIN KREYSZIG, Copyright @ 2006 John-Wiley and Sons Inc.
15	<p>Additional references:</p> <ul style="list-style-type: none"> - http:// www. wiley.com / college / kreyszig/ .