

GITAM UNIVERSITY

I B.Tech First Semester 2012-2013 onwards

The title of the paper Engineering Mathematics-I is changed as Engineering Mathematics and major modifications were made. The detailed syllabus is as follows.

ENGINEERING MATHEMATICS

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be Awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Sessionals	
EUR MT 102	MT	4	---	3	60	40	4

The objective of the course is to impart knowledge in Basic concepts of Mathematics relevant to Engineering applications.

Unit-I: First order Differential Equations

(10)

Formation – Variables separable – Homogeneous, non Homogeneous, Linear and Bernoulli equations. Exact equations - Applications of first order differential equations – Orthogonal Trajectories, Newton’s law of cooling, law of natural growth and decay.

Unit-II: Higher order Differential Equations

(12)

Complete solutions - Rules for finding complementary function - Inverse operator - Rules for finding particular integral - Method of variation of parameters - Cauchy’s and Legendre’s linear equations - Simultaneous linear equations with constant coefficients - Applications of linear differential equations to Oscillatory Electrical circuits L-C, LCR – Circuits - Electromechanical Analogy.

Unit-III: Mean Value Theorems

(08)

Rolle’s, Lagrange’s and Cauchy’s mean value theorems. Taylor’s and Maclaurin’s theorems and applications (without proofs).

Unit-IV: Infinite Series

(12)

Definitions of convergence, divergence and oscillation of a series - General properties of series - Series of positive terms - Comparison tests - Integral test - D’ Alembert’s Ratio test - Raabe’s test - Cauchy’s root test - Alternating series - Leibnitz’s rule - Power series - Convergence of exponential, Logarithmic and binomial series (without proofs).

Unit-V: Linear Algebra

(12)

Rank of a Matrix – Elementary Transformations – Echelon form - Normal form (self study). Consistency of Linear system of equations $AX = B$ and $AX = 0$. Eigen Values and Eigen Vectors – Properties of eigen values(without proofs) – Cayley – Hamilton theorem (Statement only without proof) – Finding inverse and powers of a square matrix using Cayley – Hamilton theorem – Reduction to diagonal form – Quadratic form - Reduction of Quadratic form into canonical form – Nature of quadratic forms.

Text Books Prescribed:

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|---|------------------|--------------------|
| 1. <i>Higher Engineering Mathematics,</i> | Dr.B.S Grewal. | Khanna Publishers. |
| 2. <i>Engineering Mathematics Vol.-1</i> | Dr.T.K.V.Iyengar | S.Chand. |

References :

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|---|-----------------------|--|
| <i>Advanced Engineering Mathematics,</i> | Erwin Kreyszig. | Wiley Eastern Pvt. Ltd. |
| <i>Textbook of Engineering Mathematics,</i> | N.P.Bali. | Laxmi Publications (P) Ltd. |
| <i>Higher Engineering Mathematics,</i> | Dr.M.K.Venkata Raman. | National Pub. Co. |
| <i>Calculus and Analytic Geometry</i> | Thomas / Finney | Sixth edition -Narosa Publishing House |

Note: The figures in parentheses indicate approximate number of expected hours of Instruction.

GITAM UNIVERSITY

I B.Tech Second Semester 2012-2013 onwards

The title of the paper Engineering Mathematics-II is changed as Higher Engineering Mathematics –I and major modifications were made. The detailed syllabus is as follows.

HIGHER ENGINEERING MATHEMATICS – I

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be Awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Sessionals	
EUR MT 202	MT	3+1	---	3	60	40	3

The objective of the course is to impart knowledge in Basic concepts of Mathematics relevant to Engineering applications.

Unit-I: Partial Differentiation-1 (10)

Introduction to Partial differentiation - Total derivative - Differentiation of implicit functions - Geometrical interpretation - Tangent plane and normal to a surface - Change of variables - Jacobians.

Unit-II: Partial differentiation-2 (08)

Taylor's theorem for functions of two variables. Total differential - Maxima and minima of functions of two variables - Lagrange's method of undetermined multipliers - Differentiation under the integral sign, Leibnitz's Rule.

Unit-III: Fourier Series (12)

Euler's formulae - Conditions for a Fourier expansion - Functions having points of discontinuity - Change of interval - Odd and even functions - Expansions of odd or even periodic functions - Half range series and practical Harmonic Analysis.

Unit-IV: Partial differential equations (12)

Formation of partial differential equations - Solutions of a partial differential equation - Equations solvable by direct integration - Linear equations of the first order - Non-linear equations of the first order - Homogeneous linear equations with constant coefficients - Rules for finding the complementary function - Rules for finding the particular integral.

Unit-V: Applications of Partial Differential Equations (12)

Method of separation of variables – partial differential equations – wave equation – one dimensional heat flow – two-dimensional heat flow-solution of Laplace equation –Laplace equation in polar co-ordinates.

Text Books Prescribed :

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| 1. <i>Higher Engineering Mathematics,</i> | Dr.B.S Grewal. | Khanna Publishers. |
| 2. <i>Engineering Mathematics Vol.-1</i> | <i>Dr.T.K.V.Iyengar</i> | <i>S.Chand.</i> |

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| <i>Advanced Engineering Mathematics,</i> | Erwin Kreyszig. | Wiley Eastern Pvt. Ltd. |
| <i>Textbook of Engineering Mathematics,</i> | N.P.Bali. | Laxmi Publications (P) Ltd. |
| <i>Higher Engineering Mathematics,</i> | Dr.M.K.Venkata Raman. | National Pub. Co. |

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GITAM UNIVERSITY
I B.Tech Second Semester 2012-2013 onwards

The title of the paper Engineering Mathematics-III is changed as Higher Engineering Mathematics –II and major modifications were made. The detailed syllabus is as follows.

HIGHER ENGINEERING MATHEMATICS – II

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be Awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Sessionals	
EUR MT 203	MT	3+1	---	3	60	40	3

The objective of the course is to impart knowledge in Basic concepts of Mathematics relevant to Engineering applications.

Unit-I: Multiple Integrals-I (10)

Double integrals- Change of order of integration, Double integrals in Polar coordinates- Areas enclosed by plane curves,

Unit-II: Multiple Integrals-II (12)

Triple integrals - Volume of solids - Change of variables - Area of a curved surface. Beta and Gamma functions – Properties - Relation between beta and gamma functions – Dirichlet’s integrals of type I and type II.

Unit-III: Vector Differentiation (10)

Scalar and vector fields - Gradient, Divergence and Curl - Directional derivative – Identities - Irrotational and Solenoidal fields.

Unit-IV: Vector Integration (10)

Line, Surface and Volume integrals - Green’s theorem in the plane - Stoke’s and Gauss divergence theorems - Introduction of orthogonal curvilinear co-ordinates, Cylindrical co-ordinates and Spherical polar co-ordinates (self study)

Unit-V: Laplace transforms (12)

Transforms of elementary functions - Properties of Laplace transforms - Existence conditions - Inverse transforms - Transforms of derivatives and integrals - Multiplication by t^n - Division by t - Convolution theorem. Applications to ordinary differential equations and simultaneous linear equations with constant coefficients - Unit step function - Unit impulse function - Periodic functions.

Text Books Prescribed:

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|---|-------------------------|--------------------|
| 1. <i>Higher Engineering Mathematics,</i> | Dr.B.S Grewal. | Khanna Publishers. |
| 2. <i>Engineering Mathematics Vol.-1</i> | <i>Dr.T.K.V.Iyengar</i> | <i>S.Chand.</i> |

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| <i>Advanced Engineering Mathematics,</i> | Erwin Kreyszig. | Wiley Eastern Pvt. Ltd. |
| <i>Textbook of Engineering Mathematics,</i> | N.P.Bali. | Laxmi Publications (P) Ltd. |
| <i>Higher Engineering Mathematics,</i> | Dr.M.K.Venkata Raman. | National Pub. Co. |

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