

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
DISTANCE LEARNING PROGRAMMES DIVISION
B.S. POWER ENGINEERING
First Semester 2009-2010
COURSE HANDOUT (Backlog Students)

Course No. : POWNT ZC221
Course Title : Engineering Mathematics – I

Course Description

Calculus: Differentiation, Integration with applications.

Differential Equations: First order and second order ordinary differential equations.

Linear Algebra: Algebra of Matrices, Eigen values and Eigen vectors.

Vector calculus: Vector Calculus and application of vector Calculus.

Scope and Objectives

The aim of this course is two fold: 1. to enable the students to gain knowledge of the basics of Calculus, Linear Algebra, Vector Calculus and Differential equations; 2. to enable the students to understand and appreciate the mathematical models based on these concepts.

Prescribed Text Book

T1 Zill, Dennis G. & Michael R. Cullen, Advanced Engineering Mathematics, CBS Publishers, 2nd Edition, 2000

Reference Book

- R1. K.A. Stroud (with addition by Deseter j. Booth) Engineering Mathematics, Macmillan, 5th Edition.
- R2. Thomas, G.B. & R.L. Finney, Calculus and Analytical Geometry, Pearson Education, 9th Edition, 2001.

Study Plan and Faculty Contact Session Details

<i>Study Plan & Faculty Visit Lectures for Phase – I</i>		
Faculty Contact Session	Topic	Reference to Text Book
I	Matrices: Matrix Algebra, System of Linear Algebraic Equations, Rank of a Matrix	T1-Chapter 8: 8.1 to 8.3
	Determinants, Properties of Determinants, Inverse of a Matrix, Cramer's Rule	Art 8.4 to 8.7
	The Eigen Value Problem, Powers of Matrices, Orthogonal matrices	8.8 to 8.10
	Vectors: Vectors in 2-Space, Vectors in 3-Space, Dot Product, Cross Product, Triple Scalar Product, Lines and Planes in 3-Space.	T1-Chapter 7: Art 7.1 to 7.5
	First Order Linear Differential Equations, Separable Variables, Linear Equations, Exact Equations, Homogeneous Equations, Solutions by Substitutions	T1-Chapter 2: 2.2 to 2.5
<i>Study Plan & Faculty Visit Lectures for Phase – II</i>		
II	Higher Order Linear Differential Equations: Reduction of order, Homogeneous Linear Equations with Constant Coefficients, Undetermined Coefficients, Variation of parameters, Cauchy Euler Equations, Initial Value Problems	T1-Chapter 3: Art 3.1 to 3.6
	Vector Functions, Motion on a Curve, Velocity and Acceleration Vectors, Curvature, Tangent, Normal and Binomial Vectors, Functions of Several Variables, Directional Derivative, Tangent Planes and Normal Lines, Divergence and Curl of vector fields	T1-Chapter 9: Art 9.1 to 9.7
	Line Integrals, Double Integrals, Double Integrals in Polar Coordinates, Green's Theorem, Surface Integrals, Stokes' Theorem, Triple Integrals, Volume, Divergence Theorem	Art 9.8 to 9.16

Evaluation Scheme:

EC No	Components	Duration	Weightage	Date	Nature
1.	Assignment – I	--	20%	06/02/2010	Take Home
2.	Assignment – II	--	20%	20/02/2010	Take Home
3.	Compre. Exam	3 Hours	60%	07/02/2010	40% Closed book (10 AM to 12 Noon) 20% Open Book (12 Noon to 1 PM)

Instructor-in-charge