COURSE TEACHING STRUCTURE
Course-Engineering Mathematics-1 (701001)

Class: FE
Unit – 1: Differential Calculus (9 Lectures & 15 Marks)

Unit No.	Lecture No.	Topics to be covered	Duration (in minutes)	Topic Based on	Marking Scheme
1	01	General Introduction of the subject, syllabus, importance etc.	60	Numerical	-
	02	Introduction to derivatives, increasing and deceasing function	60	Numerical	-
	03	Rolle's Theorem, Statement, Geometry and examples	60	Numerical	5
	04	Lagrange's Mean value them, Statement, Geometry and examples	60	Numerical	5
	05	Cauchy's Mean value them, Statement, Geometry and examples	60	Numerical	5
	06	Maclaurin's expansion, problems	60	Numerical	5
	07	Std. expansion, Methods of expansion and Examples	60	Numerical	5
	08	Taylor's thm. , different form problems	60	Numerical	
	09	Indeterminate forms, Methods to solve	60	Numerical	5
	10	Examples on L'Hospital rule	60	Numerical	5
	11	Revision of all topic taught	60	Numerical	
	12	Unit test-1	60	Numerical	30

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Class: FE

Unit – 2: Fourier Series (9 Lectures & 15 Marks)

Unit No.	Lecture No.	Topics to be covered	Duration (in minutes)	Topic Based on	Marking Scheme
2	01	Introduction, even and odd unction,periodic function	60	Numerical	5
	02	Define, Dirichlets conditions, Properties,	60	Numerical	5
	03	Full range FS in the interval [-π , π] and [0,2π]	60	Numerical	5
	04	Full range FS in the interval [-L , L] and [0,2L]	60	Numerical	5
	05	Half range FS in the interval [0,π] , Problems	60	Numerical	5
	06	Half range FS in the interval [0,L] , Problems	60	Numerical	5
	07	Introduction to Parsewal identity	60	Numerical	5
	08	Harmonic Analysis, Problems	60	Numerical	5
	09	Examples on Harmonic Analysis	60	Numerical	5
	10	Revision of all topic taught	60	Numerical	5

COURSE TEACHING STRUCTURE
Course-Engineering Mathematics-1 (701001)

Class: FE

Unit – 3: Partial Differentiation (9 Lectures & 17 Marks)

Unit No.	Lecture No.	Topics to be covered	Duration (in minutes)	Topic Based on	Marking Scheme
3	01	Partial derivative : Defn., Notations, Derivatives of higher order	60	Numerical	6
	02	Derivatives of higher order Problems	60	Numerical	6
	03	Euler's thm. On homogeneous function of two variables, deductions	60	Numerical	6
	04	Problems	60	Numerical	6
	05	Composite function, Implicit function, problems	60	Numerical	6
	06	Euler's thm. On homogeneous function of three variables, deduction	60	Numerical	6
	07	Euler's thm Problems	60	Numerical	6
	08	Problems on total derivative	60	Numerical	6
	09	Change of independent variable , problems	60	Numerical	6
	10	Revision of all topic taught	60	Numerical	
	11	Unit test-3	60	Numerical	30

COURSE TEACHING STRUCTURE
Course-Engineering Mathematics-1 (701001)

Class: FE

Unit – 4: Applications of Partial Differentiation (9 Lectures & 18 Marks)

Unit No.	Lecture No.	Topics to be covered	Duration (in minutes)	Topic Based on	Marking Scheme
4	01	Jacobian : Defn., Jacobian of composite function	60	Numerical	6
	02	composite function Problems	60	Numerical	6
	03	Application of Jacobian , Problems	60	Numerical	6
	04	Application of Jacobian , Problems	60	Numerical	6
	05	Errors and Approximations, Problems	60	Numerical	6
	06	Functional dependence: Defn., Problems	60	Numerical	6
	07	Maxima and Minima of two variables, conditions, Problems	60	Numerical	6
	08	Lagrange's method of undetermined multipliers, Problems	60	Numerical	6
	09	Problems on Lagrange's method.	60	Numerical	6
	10	Revision of all topic taught	60	Numerical	6
	11	Unit test-4	60	Numerical	30

COURSE TEACHING STRUCTURE
Course-Engineering Mathematics-1 (701001)

Class: FE

Unit – 5:   Linear Algebra-Matrices, System of Linear Equations (9 Lectures & 17 Marks)

Unit No.	Lecture No.	Topics to be covered	Duration (in minutes)	Topic Based on	Marking Scheme
5	01	Introduction to Matrices and real world problems	60	Numerical	6
	02	Defn. , types, rank of matrix, methods to find rank.	60	Numerical	6
	03	Problems on rank by echelon form	60	Numerical	6
	04	System of linear equations: Conditions for consistency	60	Numerical	6
	05	Examples on homogeneous equation	60	Numerical	6
	06	Examples on Non- homogeneous equation	60	Numerical	6
	07	Linear dependence and independence of vectors	60	Numerical	6
	08	Linear transformation, Problems	60	Numerical	6
	09	orthogonal transformation, Problems	60	Numerical	6
	10	Revision of all topic taught	60	Numerical	
	11	Unit test-5	60	Numerical	30

COURSE TEACHING STRUCTURE
Course-Engineering Mathematics-1 (701001)

Class: FE
Unit – 6: Linear Algebra-Eigen Values and Eigen Vectors, Diagonaliztion
    (9 Lectures & 18 Marks)

Unit No.	Lecture No.	Topics to be covered	Duration (in minutes)	Topic Based on	Marking Scheme
6	01	Defn. Eigen values , Eigen vector	60	Numerical	6
	02	Examples on Eigen values , Eigen vector	60	Numerical	6
	03	Examples on repeated Eigen values	60	Numerical	6
	04	Statement Cayley Hamilton thm	60	Numerical	6
	05	Examples on Cayley Hamilton thm	60	Numerical	6
	06	Diagonalization of a Matrix	60	Numerical	6
	07	Reduction to quadratic form by linear transformation	60	Numerical	6
	08	Reduction to quadratic form by Orthogonal transformation	60	Numerical	6
	09	Examples on Matrix application in Engineering	60	Numerical	6
	10	Revision of all topic taught	60	Numerical	
	11	Unit test-6	60	Numerical	30

Total-54+6 (For Revision and Doubt Solving Sessions)

Reference Books:

No.	Name of The Author	Title of Book	Edition	Publication
1	Chandrika Prasad & Reena Garg	Advanced Engineering Mathematics	-	Khanna BooK Publication
2	B. V. Raman	Higher Engineering Mathematics	-	Tata McGraw
3	Sashtry	Advanced Engineering Mathematics(ISBN:9788120336094)	-	PHI
4	B. V. Raman	Higher Engineering Mathematics	-	Tata McGraw - Hill
5	Erwin Kreyszig	Higher Engineering Mathematics	-	Wiley Eastern Ltd.
6	Peter V. O'Neil	Higher Engineering Mathematics	7	Thomas Learning
7	M. D. Greenberg	Higher Engineering Mathematics	2	Pearson Education
8	B. S. Grewal	Higher Engineering Mathematics	-	Khanna Publication, Delhi
9	P. N. Wartikar & J. N. Wartikar	Applied Mathematics (Volume 1& 2)	-	Pune Vidyarthi Griha Prakashan