COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	ADVANCED MATHEMATICS & SOFT COMPUTING	MA-101	Min "D"	Min "D"	5.0

ADVANCED MATHEMATICS & SOFT COMPUTING

UNIT – I

Numerical solution of Partial Differential Equation (PDE) Numerical solution of PDE of hyperbolic, parabolic and elliptic types by finite difference method.

UNIT – II

Integral transforms : General definition, introduction to Mellin, Hankel and fourier transforms and fast Fourier transforms, application of transforms to boundary value problems in engineering.

UNIT – III

Integral equations : Conversion of Linear Differential equation (LDE) to an integral equation (IE), conversion of boundary value problems to integral equations using Green's function, solution of Integral equation, IE of convolution type, Abel's IE integro differential equations, IE with separable variable, solution of Fredholm Equation with separable kernels, solution of Fredholm and volterra equations by method of successive approximations.

UNIT – IV

Calculus of variation : Functionals, solution of Euler's equation, Isoperimetric problems, solution of boundary value problems (Rayleigh – Ritz method) Hemilton's principle, Langrange's equation.

UNIT – V

Fuzzy sets, Operation of fuzzy sets, fuzzy arithmetic and relations, fuzzy relation equations, fuzzy logic. Approximate reasoning, Applications of fuzzy logic in Civil Engineering.

References :

1. Introduction to Numerical Analysis by CF Froberg.
2. Introductory Methods of Numerical Analysis by S.S.Sastry.
3. Integral Equations by Krasnove, Kiselevanded Makarenho.
4. Finite Element Analysis (Schaum Outline Series) by Buchanan TMH
5. Finite Element Analysis by Krishnamurthy TMH
6. Higher Engineering Mathematics by B.V. Ramana, Tata Mc Hill
7. Advance Engineering Mathematics by Ervin Kreszig, Wiley Easten Ed
8. Applied Numerical Methods with MATLAB by Steven C Chapra TMH
9. Numerical Methods in Engineering by Salvadori and Baron
10. Theory and Problems of Numeric Analysis (Schaum Outline Series) by Schied TMH

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	THEORY OF ELASTICITY	CE-114	Min "D"	Min "D"	5.0

THEORY OF ELASTICITY

UNIT – I

Plane Stress & Strain : Plane Stress, Plane Strain, Stress and Strain at a points, Differential equations of equilibrium, constitutive relation : Ansisotropic materials, Linear elasticity, Stress, Strain, Constitutive relations, Boundary conditions, Compatibility equation, stress function.

UNIT – II

Two Dimensional Problems in Rectangular Co-ordinates : Solutions by Polynomials Saint-Venant's Principle, Determination of displacements, bending of beams, solution of two dimensional problem in Fourier series.

UNIT – III

Two Dimensional Problems in Polar Co-ordinates : General equations in Polar co-ordinates, Pure bending of curved bars, displacements for symmetrical stress distributions, bending of curved bar, stress distribution in plates with circular holes, stresses in a circular disc, general solution.

UNIT – IV

Analysis of stress and strain in three Dimensions : Principal stress and strain shearing stress and strains, elementary equation of equilibrium, compatibility conditions, problems of elasticity involving pure bending of prismatic bars.

UNIT – V

Torsion of Prismatic Bars : Torsion of prismatic bars, membrane analogy, torsion of a bar of narrow rectangular cross section, torsion of rectangular bars, solution of torsional problem, torsion of rolled section, torsion of hollow shafts and thin tubes, torsion buckling, torsional flexural buckling.

References :

1. Theory of Elasticity by Timoshenko S.P.
2. Theory of Elastic Stability by Timoshenko S.P
3. Structural Stability of Columns & Plates by Iyenger N.G.R.

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	ADVANCE STRUCTURAL ANALYSIS	CE-115	Min "D"	Min "D"	5.0

ADVANCE STRUCTURAL ANALYSIS

UNIT – I

Matrix method (Flexibility Method) : Force methods, Basic Concepts, evaluation of flexibility, transformation, analysis of a single member of different types, transformation of single member.

UNIT – II

Applications to plane and space structures with pin joints and rigid joints, energy approach in flexibility method, effect of support displacement and transformation.

UNIT – III

Matrix Method (stiffness Method): Displacement methods, Basic concepts, Evaluation of stiffness coefficients, Direct stiffness method, energy approach in stiffness method, Code Number approach for global stiffness matrix, effect of support displacement and temperature.

UNIT – IV

Symmetrical & Asymmetrical problems. Stiffness of plane & space frames, solution of problems, comparison of force and displacement methods.

References :

1. Basic Structural Analysis by C.S. Reddy, TMH Publishers
2. Matrix Analysis of Framed Structures by W.Wearer Jr. & James M.Gare CBS Pub.
3. Computational Structural Mechanics by Rajsekeran, Sankar subramanian,PHI
4. Structural Analysis : A matrix approach by Pandit TMH.

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	DESIGN OF SPECIAL CONCRETE STRUCTURES	**CE-116**	**Min "D"**	**Min "D"**	**5.0**

DESIGN OF SPECIAL CONCRETE STRUCTURES

UNIT – I

Earthquake and wind effects on structures, loads on structures, reinforced concrete design of flat slabs, grid floors, deep beams, design of buildings : load bearing and framed structures, design of foundations, seismic analysis.

UNIT – II

Design of ground and elevated water tanks, design of bridge decks.

UNIT – III

Pre-stressed concrete : analysis and design of sections under flexure using limit state approach, anchorage zone and end block design, composite construction, introduction to statistically indeterminate pre-stressed concrete structures.

UNIT – IV

Silos and bunkers : Janseen's and Airy's theory, rectangular bunkers with sloping bottoms and with high side walls, battery of bunkers.

References :

1. Elements of Earthquake Engineering by Jaikrishna & Chandra sekharan
2. Text book of Reinforced Concrete by Shah and Karve
3. R.C.C. Designs by Punamia
4. IS – 456, - 875, - 1893, - 1984
5. Pre stressed Concrete by Krishna Raju
6. Advanced RC Designs, by Varghese PHI
7. Theory and Problems of RC Design (Shaum's outline) by Everard TMH

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	FINITE ELEMENT METHOD	CE-117	Min "D"	Min "D"	5.0

FINITE ELEMENT METHOD

UNIT – I

Introduction to Finite Element Method : General Applicability and Description of Finite Element Method. Comparison with other methods.

UNIT – II

Solution of Finite Element Method : Solution of Equilibrium problems, Eigen value problems, propagation problems, computer implementation of Gaussian eliminations. Choleski's decomposition, Jocobi's and Ranga Kutta Method.

UNIT – III

General Procedure of Finite Element Method : Discretization of the domain, Selection of Shapes, Types and Number of elements, node numbering technique , Interpolation Polynomials, their selection and derivation in terms of global and local coordinates, Convergence requirements. Formulation of Element characteristic, matrices and vectors, Variational approach. Assembly of Element matrices and Vectors, Derivation of system equations, computation of element resultants.

UNIT- IV

Iso-parametric Formulation : Lagrange and Hermite interpolation functions, Iso parametric Elements, Numerical Integration.

UNIT – V

Static Analysis : Formulation of equilibrium equation, Analysis of truss, Frames, plane stress and plane strain problems plates and shells.

References :

1. Finite Element and Structural Analysis by Weaver, Johnson
2. Matrix Structural Analysis by H.C. Martin
3. Finite Element Methods by CF Abel, CS Desai,
4. Finite element Analysis (Schaum outline series) by Buchanan TMH
5. Finite Element Analysis by Krishnamurthy TMH

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	NUMERICAL COMPUTATION LAB	CE-105L	Min "D"	Min "D"	5.0

NUMERICAL COMPUTATION LAB

The exercises in this component shall be designed to demonstrate the basic principles outlined in different units of the theory paper. After completing the exercises the student should have developed a good grasp of the practical utilities of the theory content.

(Suggested Exercise)

Review of the following components :

1. Algorithms & Flow Charts

2. 'C' Programming

(i) Preliminaries (ii) Constants & Variables (iii) Arithmetic Expressions (iv) Input-Output Statements (v) Control Statements (vi) Looping Statements (vii) Subscripted Variables (viii) Elementary Format Specifications (ix) Logical Statements & Decision Tables (x) Functions & Subroutines

3. Computer Oriented Numerical Methods

(a) Solution of Non Linear Equation (i) Bisection Method (ii) Newton Method

(b) Numerical Integration (i) Trapezoidal Method (ii) Simpson's 1/3 & 3/8 rule

(c) Curve Fitting (i) Construction of forward, backward difference table (ii) Interpolation

4. Application of statistical packages

(Suggested Exercise)

1. To find the largest among three numbers
2. To check whether a given string is a palindrome or not.
3. To find factorial of a given number by iteration.
4. To find whether the given integer is a prime number.
5. To find sum of n terms of series:
   a. n – n*2/2! + n*3/3! - n*4/4! + ...
6. To find sum and average of n integers using a linear array.
7. To read n numbers from the keyboard and display these numbers in the reverse order their entry.
8. To search a given number within a linear array.
9. To generate the fibbonacci series.
10. To find factorial of a given number using a function.
11. To deduce error involved in polynomial equation.
12. To Find out the root of the Algebraic and Transcendental equations using Bisection, Regula-falsi, Newton Raphson and Iterative Methods. Also give the rate of convergence of roots in tabular form for each of these methods.
13. To implement Newton's Forward and Backward Interpolation formula.

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	ADVANCED STRUCTURES LAB	CE-118L	Min "D"	Min "D"	5.0

ADVANCED STRUCTURES LAB

The exercises in this component shall be designed to demonstrate the basic principles outlined in different units of the theory paper. After completing the exercises the student should have developed a good grasp of the practical utilities of the theory content.

(Suggested Exercise)

1. Study of strain gauge meter & its application.
2. Measurement of strain using strain gauge meter.
3. To combine the given size of aggregates with given fine aggregate so as to suit the practical grading.
4. To carry out mix design for cement concrete of a specified grade by I.S. code method.
5. To carry out mix design for cement concrete of a specified grade by A.C.I. method.
6. Study of Begg's deformeter.
7. To determine calibration constant of Begg's deformeter.
8. To determine the surface area of combined aggregate obtained by combining F.A.& C.A. in the ratio of 1:2 by weight.