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<th>SEMESTER - I</th>
<th>CONTACT HRS.PER/WEEK</th>
<th>EXAMINATION SCHEME</th>
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<td>SUB Code.</td>
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<td>MSE601</td>
<td>Theory of Elasticity &amp; Plasticity</td>
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<td>MSE602</td>
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<td>MSE621</td>
<td>Labrotary-1</td>
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<td>MSE 752</td>
<td>Finite Element Method</td>
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<td>MSE 753</td>
<td>Structural Dynamics &amp; Earthquake Engineering</td>
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<td>MSE 754</td>
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FACULTY OF ENGINEERING AND TECHNOLOGY
Proposed Revised Structure of M.E. Second Year (ENVIRONMENTAL.ENGG)

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<th>SEMESTER - III</th>
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Elective –I is to be chosen from the following:
- a) Bridge Engineering
- b) Design of Composite Construction
- c) Advanced Design of Concrete Structures

Elective –II is to be chosen from the following:
- a) Structural Stability
- b) Analysis of Composite Structures
- c) Inelastic Analysis of Plates.

The following are the syllabi in the various of the examination for the degree of Master of Engineering (Civil – Structure).
MSE 601: Theory of Elasticity and Plasticity

Teaching Scheme:
Lectures: 3 Hours/Week
Tutorial: 1 Hours
Credit: - 4

Examination Scheme:
Theory Paper: 80 Marks
Test: 20 Marks
Credit: - 4

Unit 1. Elasticity:
Stress at a point, stress tensor, stress components on a rectangular parallelepiped in Cartesian coordinate system, derivation of stress equilibrium equations, transformation of stresses, stress invariants. The state of strain at a point, strain displacement relations, strain compatibility condition and stress compatibility conditions. Generalized Hook’s law.

(06 Hrs.)

Unit 2. Elasticity:

(04 Hrs.)

Unit 3. Elasticity:
Relationship between Cartesian and Polar coordinate system, Equilibrium equations, Strain displacement relations, Stress-strain relationship, Strain-displacement relationship for plane stress and plane strain conditions

(06 Hrs.)

Unit 4. Elasticity:
Torsion, Assumptions and Torsion equation for general prismatic solid bars, Warping of Non-circular sections and St. Venant’s theory

(04 Hrs.)

Unit 5. Plasticity:
Basic concepts, yield criteria, Criterion of yielding, von Mises initial yield condition, the Tresca initial yield condition, strain hardening rules of plastic flow different stress-strain relation, flow and deformation theories

(06 Hrs.)
Unit 6. Plasticity:
Plane stress and plane strain problems, torsion, bending of bars, theoretical problems. Examples of tube under pressure (04 Hrs.)

Reference Books:
7. Plasticity for Mechanical Engineers, Johnson w. and mellor
8. Introduction to Mechanics of solid Venkatraman and patel
MSE 602: Advanced Structural Mechanics – I

Teaching Scheme:
Lectures: 3 Hours/Week
Tutorial: 1 Hours
Credit: - 4

Examination Scheme:
Theory Paper: 80 Marks
Test: 20 Marks
Credit: - 4

Unit 1: Beams on Elastic Foundations, Semi-infinite and Finite Beams (05 Hours)

Unit 2: Generalised Grid Structures, Analysis of right angle, skew and curved Bridges (07 Hours)

Unit 3: Principle of Multiple and Substitute Frame Method (04 Hours)

Unit 4: Analysis of Beams Curved in Plan (06 Hours)

Unit 5: Secondary Stresses in Frames and Trusses (04 Hours)

Unit 6: Minimum Weight Design of Plane Frames (04 Hours)

Reference Books:
1. Theory of Structures ------------------------ Ramamurtham
4. Theory of Structures------------------------ Vazarani and Rathavani
5. Structural Analysis ------------------------ A. Ghali and A. M. Neville
   (A Unified classical Matrix approach)
MSE 603: Advanced Concrete Technology:

Teaching Scheme
Lectures: 3 Hours/Week
Term Work: 25
Tutorial: 1 Hours/Weeks

Examination Scheme
Theory Paper: 80 Marks
Test: 20 Marks
Credit: - 4

Unit 1
Types of Cementitious materials, Types and properties of Chemical Admixtures, compatibility with cement, Natural and Artificial sand (04 Hrs.)

Unit 2
Fresh Concrete: Rheology, Workability, Cohesiveness, Segregation, Temperature, Air Content, Hardened Concrete: Factors affecting properties of concrete, Strength, Elasticity, Shrinkage, Creep and Durability of concrete, Testing of Concrete: Destructive and nondestructive tests (06 Hrs.)

Unit 3
Methods of Concrete mix proportioning: IS 10262, ACI method, British method and their relative merits and demerits. Quality control of concrete, Statistical aspects. (06 Hrs.)

Unit 4
High Performance Concrete: Materials, properties, Mix proportioning, Ready Mix Concrete, (04 Hrs.)

Unit 5
Self Compacting Concrete: Materials, properties, Mix proportioning (04 Hrs.)

Unit 6
Concrete Composite: Various types of Fibers used in concrete, Law of Mixtures, Halpin-Tsai Equations for evaluation of elastic constants, Behavior of Fiber Reinforced Concrete (FRC) in Tension, Compression, Flexure, shear, Fatigue and Impact, Durability aspects of FRC. (06 Hrs.)

Reference Books:
1. Properties of concrete..................A.M.Neville
2. Concrete Technology .................D.F.Orchard
4. Concrete technology…………………M.S.Shetty.
6. Fiber Reinforced Cement Composites………. Balaguru P.N. and Shah S.P.
MSE 604: Numerical Methods

Teaching Scheme
Lectures: 3 Hours/Week
Term Work: 25
Tutorial: 1 Hours/Weeks

Unit 1: Number representation and errors, Number in different bases, Non integer & Fraction, mantissa, exponent, normalized scientific notations, Errors in representing numbers, Inverse error analysis, Loss of Significance, Introduction to MATLAB. (04 Hours)


Unit 3: Interpolation and Curve Fitting, Discrete Data, Lagrange’s Interpolating Polynomial, Newton’s Polynomial Method, Limitations of Interpolation with Polynomials, Spline Interpolation, Curve Fitting, Least Square Fit, Fitting with straight Line, Polynomial Fit, Weighted Linear Regression, Fitting Exponential Function, Application of various methods using MATLAB. (06 Hours)

Unit 4: Numerical Differentiation and Integration, Taylor’s Series, Finite Difference Method, Error in Finite Difference Approximation, Richardson Extrapolation, Derivatives by Interpolation, Cubic Spline Interpolant, Numerical Integration or Quadrature, Newton Cotes Formula, Trapezoidal & Composite Trapezoidal Rule, Simpson Rule, Recursive Trapezoidal Rule, Romberg Integration, Gaussian Integration, Orthogonal Polynomial, Abscissas and

Examination Scheme
Theory Paper: 80 Marks
Test: 20 Marks
Credit: 4
Weights for Gaussian Quadrature, Gauss Legendre Quadrature, Gauss Laguerre & Gauss Hermite Method, Gauss-Chebyshev Quadrature, Gauss Quadrature with Logarithmic Singularity, Application of various methods using MATLAB. (06 Hours)


**Unit 6:** Boundary Value Problem, Shooting Method, Two Point Boundary Value Problem, Eigenvalues and Eigenvectors, Symmetric Matrix Eigenvalue Problem, Inverse Power & Power Methods, Eigenvalue Problem in Structural Dynamics, Inverse Vector iteration method, Application of various methods using MATLAB. (04 Hours)

**Reference Books:**

MSE 641: (Elective-1) Bridge Engineering

Teaching Scheme:                                  Examination Scheme:
Lectures: 3 Hours/Week                           Theory Paper: 80 Marks
Tutorial: 1 Hours                                Test: 20  Marks
Credit: - 4                                      

Unit – 1
Classification and components of bridges, historical perspective, layout and planning, investigations for bridges, choice of type of the bridges, conceptual bridge design, bridge aesthetics. bridge appurtenances. Loading standards for highway and railway bridges (IRC, IRS) (05 Hours)

Unit - 2
Slab culvert bridges, slab-and-beam bridges, load distribution in slabs and beams, bow-string girder bridges, behaviour of skew bridge decks. Behaviour, analysis and design of RC and PSC box-girder bridge decks. (05 Hours)

Unit - 3
Behaviour, analysis and design of steel bridge decks: girder bridges, truss bridges, arch bridges, composite construction (05 Hours)

Unit - 4
Design of bearings, substructure and foundations – piers and abutments of different types, shallow and deep foundations – design and constructional aspects (05 Hours)

Unit - 5
Modern methods of construction of concrete, steel and composite bridges, their impact on analysis and design (05 Hours)
Unit - 6
Introduction to analysis and design of long span bridges: suspension and cable stayed bridges.
(05 Hours)

Recommended Books:
1. Design of Bridges: Raju N. K., Oxford & IDH
3. Concrete Bridge Practice: Raina V.K., Tata McGraw Hill.
MSE 642: (Elective-I) Design of Composite Construction

Teaching Scheme:
Lectures: 3 Hours/Week
Tutorial: 1 Hours
Credit: - 4

Examination Scheme:
Theory Paper: 80 Marks
Test: 20 Marks
Credit: - 4

Unit 1:
Introduction of Composite Constructions. Benefits of Composite Construction, Introduction to IS, BS and Euro codal provisions. Composite beams, elastic behaviour of composite beams, No and Full Interaction cases, Shear Connectors, Ultimate load behaviour, Serviceability limits, Effective breadth of flange, Interaction between shear and moment, Basic design consideration and design of composite beams. (05 Hrs)

Unit 2:
Composite floors, Structural elements, Profiled sheet decking, Bending resistance, Serviceability criteria, Analysis for internal forces and moments (05 Hrs.)

Unit 3:
Composite Columns, Materials, Concrete filled circular tubular sections, Non-dimensional slenderness, local buckling of steel sections, Effective elastic flexible stiffness, resistance of members to axial compressions, Composite Column design, Fire Resistance. (05 Hrs.)

Unit 4:
Composite trusses, Design of truss, Configuration, Application range, Analysis and Design aspects and connection details. (05 Hrs.)

Unit 5:
Design of Multi-storeyed commercial and residential composite building, Design basis, load calculations, Design of composite slabs with profile decks, composite beam design, design for compression members, vertical cross bracings, design of foundation. (05 Hrs.)

**Unit 6:**

**Reference Books:**

2. INSDAG teaching resources for structural steel design Vol – 2, Institute for Steel Development and Growth Publishers, Calcutta
4. INSDAG Design of Composite Truss for Building, Institute for Steel Development and Growth Publishers, Calcutta
5. INSDAG Handbook on Composite Construction – Bridges and Flyovers, Institute for Steel Development and Growth Publishers, Calcutta
6. INSDAG Design Guide for Composite Highway Bridges (Steel Bridges), Institute for Steel Development and Growth Publishers, Calcutta
MSE 643: (Elective-1) Advanced Design of Concrete Structures

Teaching Scheme:
Lectures: 3 Hours/Week
Tutorial: 1 Hours
Credit: - 4

Examination Scheme:
Theory Paper: 80 Marks
Test: 20 Marks

Unit 1:
Yield Line Theory for analysis of Slabs: Equilibrium and virtual work methods of analysis, Rectangular slabs and triangular slabs with various edge conditions – yield line patterns, Circular slabs, Design for limit state of strength and serviceability, Orthotropically reinforced slabs. (04 Hrs.)

Unit 2:
Limit state design of bunkers, silos, spherical and conical domes, liquid retraining structures, chimneys, cooling towers. (06 Hrs.)

Unit 3:
Elevated Service Reservoirs: Rectangular, Circular. Design of staging for wind and earthquake forces, container with flat top and domed bottom. Membrane analysis, Effect of Joint reactions due to continuity. (06 Hrs.)

Unit 4:
Design of Pretension and Posttension Flexural members: Design of partially Prestressed concrete members. Prestressed Concrete Slabs: Introduction, Design of one way, two way and flat slabs. (04 Hrs.)

Unit 5:
shrinkage, Deflections, Flexural and Shear strength of composite sections, Design of composite sections. (06 Hrs.)

**Unit 6:**
Prestressed Concrete Pipes and Tanks: Circular prestressing, types of Prestressed concrete pipes. Prestressed Concrete tanks: General features, Analysis and design of circular tanks. (04 Hrs.)

**Reference Books**

2. N. Krishna Raju – Prestressed Concrete, Tata Mc Graw Hill Publication Co
3. Limit State Design of Prestressed Concrete, Guyon Y.
MSE623: SEMINAR –I

**Teaching Scheme:**
Practical: 02 Hours / Week

**Exam Scheme:**
Term work: 50 marks
Credit: 1

Each candidate is required to give one seminar on any chosen topic connected with the field of specialization. The topic shall be chosen in consultation with the concerned Faculty and Head of the Department. Preparation and presentation of a seminar is intended to investigate an in-depth review of literature; to prepare a critical review and to develop confidence for making a good presentation. A report has to be submitted in the prescribed format and the seminar shall be evaluated by the respective department committee.

Seminar shall be a term work submitted in the form of technical report of research, analysis and design on any current topic in the concerned or allied field. It is expected that the students should refer the journals, and proceedings of National and International seminar / conference. Student should follow standard practice of seminar report writing (International journals). The candidate will deliver a talk on the topic and the assessment will be made on the basis of term work and the talk thereon by internal examiner appointed by the Principal of the Institution. Seminar topics from text and reference books will not be accepted.
MSE621: LABROTARY-I

Teaching Scheme:  
Practical: 02 Hours / Week

Exam Scheme:  
Practical Exam: 25 Marks
Credit: - 1

Lab – I (Advanced Concrete Technology)

The experiments to be performed are as given below:

1. To obtain compressive strength, split tensile strength using IS method of mix design.
2. To obtain compressive strength, split tensile strength using British method of Mix design.
3. To obtain compressive strength, split tensile strength using ACI method of Mix design.
MSE622: LABROTARY-II

Teaching Scheme:       Exam Scheme:
Practical: 02 Hours / Week       Practical Exam: 25 Marks
Credit: -2

Lab – II (Numerical methods)
(Term work- 25 marks, Practical / Oral – 25 marks)
The experiments will be assignments with manual solution and solutions using MATLAB
programming on the following topics:

1. Simple programs for matrix algebra, Plotting 2-D and 3-D graphs, Applications of DO
   loop, WHILE loop, Conditional Operators, Programming through MATLAB built-in
   functions etc.
2. Gauss Elimination Method. (Solving Linear Simultaneous Equation)
5. LU Decomposition Method.
10. Linear & Exponential Curve Fitting.
11. Curve Fitting (Weighted Non-Linear Regression)
14. Richardson Extrapolation.
15. Romberg Integration.
16. Runge Kutta (Second & Forth Order Method)
17. Solving ODE & PDE through MATLAB Solver.
18. Shooting Method (Two Point Boundary value Problem: Application in Static & Dynamic
    Structural Analysis Problems)
19. Program for Non Linear ODE
20. Solving Eigen-Value Problem using MATLAB.
MSE 701: Advanced Structural Mechanics - II

Teaching Scheme

Lectures: 3 Hours/Week
Term Work: 25
Tutorial: 1 Hours/Weeks

Examination Scheme

Theory Paper: 80 Marks
Test: 20 Marks
Credit: - 4

Unit 1: Introduction and Review of various methods in finding slopes and deflections at a point in statically determinate and indeterminate structures. (04 Hours)

Unit 2: Direct Flexibility Matrix Method, Applications to Continuous Beams, Pin Jointed Frames, Rigid Jointed Frames. (05 Hours)

Unit 3: Generalised Flexibility Matrix Method, Applications to Continuous Beams, Pin Jointed Frames, Rigid Jointed Frames. (06 Hours)

Unit 4: Direct Stiffness Matrix Method, Applications to Continuous Beams, Pin Jointed Frames, Rigid Jointed Frames. (06 Hours)

Unit 5: Generalised Stiffness Matrix Method, Applications to Continuous Beams, Pin Jointed Frames, Rigid Jointed Frames. (05 Hours)

Unit 6: Material & Geometric Non-Linearity, Stiffness method with Material & Geometric Non-Linearity. (04 Hours)

Reference Books:

1. Matrix Analysis of Framed Structures, Weaver W, Gere G. M.
2. Structural Analysis, Hibbler R. C.
3. Basic Structural Analysis, Reddy C. S.

Unit 2: Application of FEM to solve various 1-D (One Dimensional Finite Elements, Shape Functions for 1-D Elements, Properties of Shape Functions, Lagrange Interpolating Polynomials), $C^0$ Continuum, 1-D FE Analysis (Discretization, Selection of Shape Function, Defining Gradients of Primary Unknowns & Constitutive Equations, Derivation of Element Equations, Assembly & Application of Boundary Conditions, Computation of Primary and Secondary Unknowns), Direct Approach for Assembly, Boundary Conditions (Geometric, Natural), Concept of Sub-Structuring (Static Condensation), Stiffness Matrix for the Basic Bar & Beam Element, Representation of Distributed Loading, The Assembly Process within the PMPE Approach, Element Stresses), FE Analysis of 1-D Non-Prismatic Members, Solution of Differential Equation using FEM, Solution of BIVP using Galerkin’s MWR (1-D Transient Analysis). (8 Lectures)

Unit 3: $C^1$ Continuum, Formulation of 1-D Beam Element, Classical Beam Theory, Element Equation Formulation (Galerkin’s Approach, Rayleigh-Ritz Approach), Derivation of Scalar Functional from Differential Equation and vice versa, Application to Fixed and Continuous Beams. (04 Lectures)

Unit 5: 3-D Stress Analysis using FEM, Iso-parametric Formulation, 3-D Brick Element, Application to 3-D Analysis, FEA of Axi-symmetric Solids subjected to Axi-symmetric and Asymmetric Loads (Application of Partial FEM). (04 Lectures)

Unit 6: Computer Implementation of FEM, Application of FEM to Time Dependent Problems, Partial FEM, h-version of FEM, p-version of FEM, Adaptive Meshing, Exposure to Hybrid FEM (Mixed/ Hybrid Formulation, Unidirectional Composites), Introduction to ANSYS, Static & Dynamic Analysis of 1-D, 2-D and 3-D structures using ANSYS. (04 Lectures)

Reference Books:

1. The Finite Element Method in Engineering Science…O. C. Ziekiewicz & Cheung
2. Concept and application of Finite Element Analysis…M. Mukhopdhyay
4. Finite Element Procedures, K. J. Bathe
MSE 704: Theory of Plates and Shells:

Teaching Scheme:
Lectures: 3 Hours/Week
Tutorial: 1 Hours
Credit: - 4

Examination Scheme:
Theory Paper: 80 Marks
Test: 20 Marks

Unit-1:
Introduction: Thin and thick plates, small and large deflections. Small deflection theory of thin plates, Assumptions, Moment Curvature relations. Stress resultants. Governing differential equation in Cartesian co-ordinates, various boundary conditions. (05 Hrs.)

Unit-2:
Analysis of Rectangular Plates: Navier solution for plates with all edges simply supported. Sinusoidal load, Distributed loads and point loads. Levy’s Method: Distributed load and line load. Plates under distributed edge moments. Introduction to shear deformation theories. (05 Hrs.)

Unit-3:
Circular Plates: Analysis of circular plates under axi-symmetric loading. Moment - Curvature relations. Governing differential equation in polar co-ordinates. Simply supported and fixed edges. Distributed load, ring load, a plate with a central hole. (06 Hrs.)

Unit-4:
Introduction: Classification of shells on geometry, thin shell theory, equations to shell surfaces, stress resultants, stress- displacement relations, compatibility and equilibrium equations. Shells of Revolution: Membrane theory, equilibrium equations, strain displacement relations, boundary conditions, cylindrical, conical and spherical shells. (05 Hrs.)

Unit-5:
Circular cylindrical shells: Membrane theory: Equilibrium equations, strain displacement relations, boundary conditions. Bending Theory: Equilibrium equation, strain displacement relations, governing differential equation, solution for a simply supported cylindrical shell, various boundary conditions. (05 Hrs)
Unit-6:
Bending analysis of cylindrical shells by beam theory, Finstewalder, Schorer, Flugge’s and D. K. J. theory.  
(04 Hrs.)

Reference Books

2. Ansel C. Ugural, Stresses in Plates and Shells, Mc Graw Hill
3. G. S Ramaswamy, Design and Construction of Concrete Shell Roofs, CBS Publications
6. Theory of Analysis of plates ------------------------ R. S. Zilard
MSE 791: (Elective-II) Structural Stability:

Teaching Scheme:                                       Examination Scheme:
Lectures: 3 Hours/Week                                Theory Paper: 80 Marks
Tutorial: 1 Hours                                     Test: 20 Marks
Credit: - 4                                           

Unit 1:
Fundamental concepts, elastic structural stability, structural instability, analytical methods for the
stability analysis, equilibrium, imperfections and energy methods. (05 Hrs.)

Unit 2:
Elastic buckling of columns, assumptions, critical load for various boundary conditions, columns
with geometric imperfection, large deflection theory of columns, Southwell plot, Orthogonality
of buckling modes, eccentrically loaded columns, numerical techniques – Finite difference and
Finite element approach. (05 Hrs.)

Unit 3:
Elastic buckling of beam-column, differential equations of beam-column, beam-column with
concentrated point load, several point loads, continuous lateral load, single couple, uniformly
distributed load, end couples. (05 Hrs.)

Unit 4:
Elastic buckling of frames, triangular, partial, multistory portal and box frames with symmetric
& anti symmetric buckling, stiffness method approach, approximate method, buckling of open
sections, torsional buckling. (05 Hrs.)

Unit 5:
Elastic buckling of thin plates, equilibrium approach, rectangular plate with axial load in one and
two directions, various boundary conditions, Energy methods – Rayleigh Ritz and Gelerkin,
large deformation theory of plates and effective width concept, post buckling behavior of plates.
(05 Hrs.)

Unit 6:
Dynamic stability of structures, objectives, Hamilton and Lagrange’s equation for discrete and
continuous systems, pulsating load on a column. (05 Hrs.)
Reference books

3. Iyenger N.G.R., Elastic Stability of Structural elements, Mc Millan, India

Reference Books:

1. Buckling of bars, plates and shells Don O. Brush & B. O. Almorth.
5. An Introduction to the elastic stability of structures G.J. Simitses
7. Introduction to Structural Stability Theory George Gerard
MSE 792: (Elective – II ) Analysis of Composite Structures:

Teaching Scheme:  
Lectures: 3 Hours/Week  
Tutorial: 1 Hours  
Credit: - 4

Examination Scheme:  
Theory Paper: 80 Marks  
Test: 20 Marks  
Credit: - 4

Unit 1: Constituent materials for composites – fibre and matrix (04 Hrs)
Unit 2: Structural applications of composites, fabrication processes (04 Hrs)
Unit 3: Mechanical behavior of composites (04 Hrs)
Unit 4: Stress – strain relations for orthotropic materials (04 Hrs)
Unit 5: Lamina stress – strain relations, Strength of lamina, failure criteria, Shear deformation theories for laminates (08 Hrs)
Unit 6: Stress, vibration and buckling analysis of laminate bars, beams, arches, plates and shells (06 Hrs)

Recommended Books:

MSE 793: (Elective-II) Inelastic Analysis of plates:

Teaching Scheme:
Lectures: 3 Hours/Week
Tutorial: 1 Hours

Examination Scheme:
Theory Paper: 80 Marks
Test: 20 Marks
Credit: -4

Unit 1 Limit analysis of plates, lower bound and upper bound solutions. (05Hrs)
Unit 2 Ultimate strength of reinforced concrete slabs. (05Hrs)
Unit 3 Yield line analysis by the work method and equilibrium method, isotropic and orthotropic reinforcement. (05Hrs)
Unit 4 Strip method for analysis of R.C. slabs. (05Hrs)
Unit 5 Estimation of deflections in R.C. slabs. (05Hrs)
Unit 6 Load test and acceptance criteria. (05Hrs)

REFERENCE BOOKS
1. Plastic and elastic design of slabs and plates -------------- R.H. Wood
2. Yield line analysis of slabs --------------------------- L. L. Jones
MSE773: SEMINAR- II

Teaching Scheme :
Practical: 02 Hours / Week

Exam Scheme :
Term work: 50 marks
Credit: - 1

Topic of the seminar II shall be decided in such a way that it will enhance the knowledge of the student in a particular topic which is not covered in the syllabus. It is expected that the students should refer the journals, and proceedings of National and International seminar/conferences. Student should follow International Practice of seminar report writing (International Journals). The candidate will deliver a talk on the topic and the assessment will be made on the basis of term work and the talk thereon by internal examiner appointed by the Principal of the Institution. Seminar topics from text and reference books will not be accepted.
MEV771: LABROTARY- III

Teaching Scheme:       Exam Scheme:
Practical: 02 Hours / Week       Term work: 25 marks
Credit: - 1

Lab – III (Advanced Structural Mechanics- II)

Minimum Six problems shall be solved based on the theory syllabus of Advanced Structural Mechanics- II.

MEV772: LABROTARY- IV

Teaching Scheme:       Exam Scheme:
Practical: 02 Hours / Week       Term work: 25 marks
Credit: - 2

Lab – IV (Structural Dynamics & Earthquake Engineering)

The experiments to be performed are listed below. (Minimum 7)

<table>
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<tr>
<th>Sr. No.</th>
<th>Name of the Experiment</th>
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<tbody>
<tr>
<td>1.</td>
<td>Dynamics of a three-storied building frame subjected to harmonic base motion</td>
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<tr>
<td>2.</td>
<td>Dynamics of a one-storied building frame with planar asymmetry subjected to harmonic base motion</td>
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<tr>
<td>3.</td>
<td>Dynamics of a three-storied building frame subjected to periodic (non harmonic) base motion</td>
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<tr>
<td>4.</td>
<td>Vibration isolation of a secondary system.</td>
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<tr>
<td>5.</td>
<td>Dynamics of a vibration absorber.</td>
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<td>6.</td>
<td>Dynamics of a four-storied building frame with and without an open ground floor.</td>
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<td>7.</td>
<td>Dynamics of one-span and two span beams.</td>
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<tr>
<td>8.</td>
<td>Earthquake induced waves in rectangular water tanks.</td>
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<tr>
<td>9.</td>
<td>Dynamics of free-standing rigid bodies under base motions</td>
</tr>
<tr>
<td>10.</td>
<td>Seismic wave amplification, liquefaction and soil-structure interactions.</td>
</tr>
</tbody>
</table>
SEMESTER – III

MSE751: DISSERTATION PART-I

Teaching Scheme:
Practical: 12 Hours / Week

Exam Scheme:
Term work: 50 marks
Credit: 12

It will be taken up by the student at the end of the second semester and the duration would be six months. This is aimed at training the students to analyze independently any problem posed to them. The work may be analytical, experimental, design or combination of these. The dissertation report is expected to exhibit clarity of thought and expression, critical appreciation of the existing literature and analytical and/or experimental or design skill. The evaluation of dissertation will be based on continuous internal assessment comprising three seminars, one internal Viva-voce and an external Viva-voce examination.

The dissertation shall consist of a report on any research work done by the candidate or a comprehensive and critical review of any recent development in the subject or detailed report of the project work consisting of experimentation/numerical work, design and or development work that the candidate has executed.

- In part I dissertation it is expected that the student should decide a topic of dissertation which is useful in field or practical life. It is expected that the students should refer the journals, and proceedings of National and International seminar/conferences. Emphasis should be given to the introduction of topic, literature review, objective of the study along with some preliminary work/experimentation carried out on dissertation topic.

- Student should submit part I dissertation report (soft bound) in three copies covering the content discussed above and highlighting the features of the works to be carried out part II of the dissertation. Student should follow standard practice of dissertation writing.

- The candidate will deliver a talk on the topic and the assessment will be made on the basis of term work and the talk thereon by internal examiner appointed by the Principal of the Institution.
SEMESTER - IV

MSE 752: DISSERTATION PART - II

**Teaching Scheme:**
Practical: 20 Hours / Week

**Exam Scheme:**
Term work: 100 Marks
Practical: 200 Marks
Credit: 20

The part II of dissertation will be in continuation of part I after completion of work satisfactorily the examinee shall submit the dissertation in soft bound two copies to the head of department. The examinee shall present the pre synopsis of the dissertation work before two internal examiners out of which one will be guide. The suggestion given by these two examiners should be incorporated before submitting the final four copies of the head of the institution. The term work marks should be submitted to the university by the internal guide, examinee should take into account the opinion of other two examiners who were present at time of pre synopsis.

Viva-voce examination shall consist of defense presented by the examinee on his/her work in the presence of other teachers and students and two examiners appointed by the university, one of whom will be the guide and second will be external examiner.