Sri BVV Sangha’s
Basaveshwar Engineering College, (Autonomous)
Bagalkot-587102

Department of Civil Engineering

SYLLABUS FOR POST GRADUATE PROGRAMME
M. Tech.
STRUCTURAL ENGINEERING

2012-2013
Basaveshwar Engineering College, Bagalkot  
Department of Civil Engineering  
M. Tech. Structural Engineering  

Scheme of Teaching and Examination

### Semester – I

<table>
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<tr>
<th>Sl.No</th>
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<td>CIE</td>
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<tr>
<td>1</td>
<td>PSE 121C</td>
<td>Advanced Design of RC Structures</td>
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<tr>
<td>2</td>
<td>PSE 103C</td>
<td>Theory of Elasticity &amp; Plasticity</td>
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<td>3</td>
<td>PSE004C</td>
<td>Structural Dynamics</td>
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<td>PSE 104 S/T</td>
<td>Seminar/ Laboratory</td>
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<tr>
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<td>PSE 211C</td>
<td>Advanced Design of Prestressed Concrete Design</td>
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<td>2</td>
<td>PSE 203C</td>
<td>Finite Element method of Analysis</td>
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<td>PSE204C</td>
<td>Earthquake Resistant Design of Structures</td>
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### Semester – III

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### Semester – IV

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# LIST OF ELECTIVES

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<tr>
<td>1</td>
<td>PSE 002E</td>
<td>Stability analysis of structures</td>
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<td>2</td>
<td>PSE 003E</td>
<td>Optimization Techniques in Civil Engineering</td>
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<td>PSE 104E</td>
<td>Advances in Concrete technology</td>
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<td>PSE 105E</td>
<td>Theory of Plates and Shells</td>
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<td>Design of Bridges</td>
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<td>PSE 106E</td>
<td>Foundation Engineering</td>
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<td>Design of Tall structures</td>
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<td>Masonry Structures</td>
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<td>Repair and Rehabilitation of Structures</td>
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ADVANCED DESIGN OF RCC STRUCTURES

Subject Code: PSE121C  
IA Marks: 50  
No. of Lecture Hours: 52  
Duration of Exam: 3 Hrs  
Maximum marks: 100  
Assignment –02 hours/week

UNIT 1:  
Design of deep beams, Design of folded plates

UNIT 2:  
Design of water tanks: Underground and above ground

UNIT 3:  
Design of bunkers and silos

UNIT 4:  
Prefabricated Construction – necessity, advantages and disadvantages, modular coordination, basic module, planning and design module, modular grid system. National building code specifications – standardization, dimensioning of products, preferred dimensions and sizes.

References
3. Punnia B.C., Ashok Kumar Jain and Arun Kumar Jain, “Comprehensive RCC Design”.
THEORY OF ELASTICITY AND PLASTICITY

Subject Code: PSE 103C  IA Marks: 50
No. of Lecture Hours: 52  Duration of Exam: 3 Hrs
Maximum marks: 100  Assignment – 02 hours/week

UNIT 1:
Definition of stress components of stress at a point, Cartesian and polar co-ordinates, Equilibrium equations, Transformation of stress, Principal stresses, invariants of stress, hydrostatic and deviatomic stress.
Definition of strain, components of strain at a point, Cartesian and polar co-ordinates, Equilibrium equations, transformation of strain, principal strain, invariant of strain, spherical and deviatoric strains, maximum shear strain, compatibility equations.

UNIT 2:
Compatibility equations, stress strain relations, constitutive relations- plane stress and plane strain.
Problems in rectangular coordinates (2D) – boundary conditions Airy’s stress function approach to 2-D problems of elasticity, simple problems on bending of beams. Solution of axi-symmetric problems, stress concentration due to the presence of a circular hole in plates. Problems in polar coordinates (2D)

UNIT 3:
3D problems: Elementary problems of elasticity in three dimensions, stretching of a prismatical bar by its own weight, twist of circular shafts, Torsion: torsion of non-circular sections

UNIT 4:

References
STRUCTURAL DYNAMICS

Subject Code: PSE 104C
No. of Lecture Hours: 52
Maximum marks: 100
IA Marks: 50
Duration of Exam: 3 Hrs
Assignment – 02 hours/week

UNIT 1:

UNIT 2:

UNIT 3:
Applications of Dunkarley’s, Rayleigh’s, Rayleigh-Ritz and matrix methods. Forced vibrations of systems without damping – mode superposition method. Response spectrum and equivalent force concepts.

UNIT 4:
Dynamics of Continuous systems: Free longitudinal vibration of bars, flexural vibration of beams with different end conditions, response of beams under moving loads, Introduction to random vibrations – Random variables and random processes, models of random dynamic loads, Stochastic processes.

References
LIST OF EXPERIMENTS

1. Concrete mix design as per IS:10262-2009
2. Concrete and RCC specimens testing using Non Destructive Testing (NDT) equipments to evaluate below mentioned parameters
   a. Strength
   b. Permeability
   c. Resistivity
   d. Rebar location
3. Evaluation of elastic properties of concrete specimen
4. Shake table test (vibration analysis)
   a. Multi storey building models
   b. Water tank and beam element models
5. Analysis of Structures using ETABS/ STAAD. Pro
6. Analysis of Structures using Ansys/SAP
ADVANCED PRE-STRESSED CONCRETE DESIGN

Subject Code: PSE211C  
IA Marks: 50  
No. of Lecture Hours: 52  
Duration of Exam: 3 Hrs  
Maximum marks: 100  
Assignment – 02 hours/week

UNIT 1:  
Analysis for Flexure: General concept of stresses, resultant compression line, load balancing concept. Analysis of members under axial load, analysis at transfer, analysis at services loads, analysis at ultimate strength. Design philosophy: Limit state of collapse and serviceability. Design for flexure: Stress range approach, Lin’s approach, Magnel’s approach.

UNIT 2:  
Design for shear and torsion: Mechanism of shear resistance in PSC beams, design for shear in PSC beams, shear in flanged beams and failure of concrete elements under torsion. Anchorage zone stresses: Pre-tensioned and Post-tensioned pre-stressed concrete elements, detailing of reinforcement in general.

UNIT 3:  
Statically indeterminate structures: analysis of pre-stressed indeterminate structures, continuous beams, linear transformation and concordancy of cable profiles, frames. Design of one way slab.

UNIT 4:  
Composite construction: Need for composite construction, types of composite construction, flexural stresses, longitudinal and transverse shear transfer, creep and shrinkage effects in composite construction.

References

UNIT 1:
Basic concepts of elasticity – kinematic and static variables, approximate methods of structural analysis: Rayleigh-Ritz method, finite difference method, finite element method. Principles of finite element method, advantages and disadvantages, finite element procedure. Discretization of structures: Finite elements used for one, two and three dimensional problems, element aspect ratio, mesh refinement versus higher order elements, numbering of nodes to minimize band width.

UNIT 2:
Displacement Model: Nodal displacement parameters, convergence criterion, compatibility requirements, geometric invariance, shape function, polynomial form of displacement function, generalized and natural coordinates, Lagrangian interpolation function, shape functions for one, two and three dimensional elements.

UNIT 3:
Concept of Isoperimetric Elements: Internal nodes and higher order elements, serendipity and Lagrangian family of finite elements, sub parametric and super parametric elements, condensation of internal nodes, Jacobian transformation matrix, variation method and minimization of energy approach of element formulation (development of strain – displacement matrix and stiffness matrix) consistent load vector, numerical integration.

UNIT 4:
Application of finite element method for the analysis of one and two dimensional problems: Analysis of simple beams and plane trusses, application to plane stress, strain and axi-symmetric problems using CST and quadrilateral elements. Application to plates and shells – Choice of displacement function (C⁰, C¹, C² type), techniques for nonlinear analysis.

References
DESIGN OF EARTHQUAKE RESISTANT STRUCTURES

UNIT 1:
Introduction to engineering seismology, seismic waves, characteristics of earthquake and its quantification – Magnitude and Intensity scales, seismic instruments.
Seismic response of buildings, structures and sites, study of response of buildings and structures during past earthquakes.

UNIT 2:
The Response Spectrum – elastic and elasto-plastic spectra, tripartite plot, use of response spectrum in earthquake resistant design.

UNIT 3:
Structural Configuration for earthquake resistant design, frames, shear walls and dual systems,
Effect of infill masonry walls on frames, problems of the soft first-storey, Capacity design procedures.

UNIT 4:
Ductility and energy absorption in buildings, Reinforced concrete for earthquake resistance, confinement of concrete for ductility, ductility of columns and beams – codal provisions
Behaviour of masonry buildings during earthquakes, failure patterns, strength of masonry in shear and flexure, concepts for earthquake resistant masonry buildings – codal provisions

References
STABILITY ANALYSIS OF STRUCTURES

Subject Code: PSE002E  IA Marks: 50
No. of Lecture Hours: 52  Duration of Exam: 3 Hrs
Maximum marks: 100  Assignment – 02 hours/week

UNIT 1:

UNIT 2:

UNIT 3:
Stability analysis by finite element approach – deviation of shape function for a two nodded Bernoulli – Euler beam element (lateral and translation of) – element stiffness and element geometric stiffness matrices – assembled stiffness and geometric stiffness matrices for a discretised column with different boundary condition – calculation of critical loads for a discretised (two elements) column(both ends built in). Buckling of pin jointed frames (maximum of two active dof) – symmetrical single way portal frame.

UNIT 4:
Lateral buckling of beams – differential equation – pure bending – cantilever beam with tip load – simply supported beam of I section subjected to central concentrated load. Pure Torsion of thin – walled bars of open cross section. Non – uniform Torsion of thin – walled bars of open cross section. Expression for strain energy in plate bending with in plate forces (linear and non – linear). Buckling of simply supported rectangular plate – uniaxial load and biaxial load. Buckling of uniformly compressed rectangular plate simply supported along two opposite sides perpendicular to the direction of compression and having various edge condition along the other two sides.

References
UNIT 1:
Introduction to optimization, engineering applications of optimization, formulation of structural optimization problems. Optimization techniques: classical optimization techniques, single variable optimization, multivariable optimization with no constraints, unconstrained minimization techniques and algorithms constrained optimization solutions by penalty function techniques, Lagrange multipliers techniques and feasibility techniques.

UNIT 2:
Linear programming, standard form of linear programming, geometry of linear programming problems, solution of a system of linear simultaneous equations, pivotal production of general systems of equations, simplex algorithms, revised simpler methods, duality in linear programming.

UNIT 3:
Non-linear programming, one dimensional minimization methods, elimination methods, Fibonacci method, golden section method, interpolation methods, quadratic and cubic methods, Unconstrained optimization methods, direct search methods, random search methods, descent methods, constrained optimization techniques such as direct methods, the complex methods, cutting plane method, exterior penalty function methods for structural engineering problems.

UNIT 4:
Geometric programming, conversion of NLP as a sequence of LP/geometric programming, Dynamic programming conversion of NLP as a sequence of LP/ Dynamic programming, Structural Optimization Formulation and solution of structural optimization problems by different techniques

References
UNIT 1:
Components of modern concrete and developments in process and constituent materials- Role of Mineral and chemical admixtures, corrosion inhibitors, adhesives and coatings, recycled aggregates. Concrete mix design procedure, Ready Mixed Concrete Light weight concrete – Introduction, classification, properties, strength and durability, mix design

UNIT 2:
High density concrete - Radiation shielding ability of concrete, materials for high density concrete, properties in fresh and hardened state, placement methods Ferrocement - materials, mechanical properties, cracking of ferrocement, strength and behavior in tension, compression and flexure, design of ferrocement in tension, ferrocement constructions, durability and applications

UNIT 3:
Fibre reinforced concrete – Constituent materials, distribution and orientation of fibers, interfacial bond, properties in fresh state, strength and behavior in tension, compression and flexure of steel fibre reinforced concrete, mechanical properties, crack arrest and toughening mechanism, applications, self compacting concrete, polymer concrete, Introduction to fiber reinforced polymer composites

UNIT 4:
High strength concrete – constituents, mix proportioning, properties in fresh and hardened states, applications and limitations, high performance concrete, reactive powder concrete, bacterial concrete, Roller compacted concrete, Foam concrete, chemicals, super-plasticized concrete, Concept of composites and smart concrete

References
THEORY OF PLATES AND SHELLS

Subject Code: PSE 105E  IA Marks: 50
No. of Lecture Hours: 52   Duration of Exam: 3 Hrs
Maximum marks: 100    Assignment – 02 hours/week

UNIT 1:
Introduction to plate theory, small deflection of laterally loaded thin rectangular plates. Theory of pure bending of plates; Navier’s and Levy’s solution of plates for various loading and boundary conditions

UNIT 2:
Use of energy methods for solution of plates with all edges clamped, symmetric loading of circular plates with various edge conditions for both solid and annular plates, design principles and detailing of folded plates.

UNIT 3:
Introduction to curved surfaces and classification of shells, membrane theory of spherical shells, cylindrical shells, hyperbolic paraboloids, elliptic, paraboloid and conoids, axi-symmetric bending of shells of revolution.

UNIT 4:
Closed cylindrical shells, water tanks, spherical shells and Geckler’s approximation, bending theory of doubly curved shallow shells, detailing simple shell – spherical domes, water tanks, barrel vaults and hyperbolic paraboloid roofs

References
UNIT 1:
Introduction: site selection for bridges, classification of bridges, review of IRC and IRS loadings, bridge substructures: abutments, piers, wingwalls and their foundations, bearings, expansion joints. Design of slab culvert and box culvert for different IRC loading cases

UNIT 2:
T-beam bridge design using COURBON’S method, HENDRY-JAEGGER and MORICE-LITTLE methods for IRC loading

UNIT 3:
Balanced Cantilever Bridge: Introduction and proportioning of components, Design of simply supported portion and design of cantilever portion, design of articulation.

UNIT 4:
PSC Bridges: Introduction, proportioning of components, analysis and structural design of slab and main girder using COURBON’s method for IRC Class AA tracked vehicle, calculation of pre-stressing force, cable profile and calculation of stresses, design of end block and detailing of main girder

References
FOUNDATION ENGINEERING

Subject Code: PSE106E  IA Marks: 50
No. of Lecture Hours: 52  Duration of Exam: 3 Hrs
Maximum marks: 100  Assignment –02 hours/week

UNIT 1:
Settlement analysis, Immediate settlements, Consolidation settlements, Total settlements, Relative settlements, Various methods of estimation.

UNIT 2:
Shallow Foundations - Conventional structural design of continuous footings. Individual footings, combined footings and Rafts of various types
Pile Foundations – Analysis and Conventional Design of pile foundations for vertical and lateral loads including design of pile cap.

UNIT 3:
Piers and Well Foundations: Analysis and design of pier and well foundations. Caissons and Coffer dams.
Foundations on expansive soils - Under reamed piles. Their design and construction
Introduction to the design of special foundations diaphragm for structures such as radar towers

UNIT 4:
Design of foundations for Chimneys and high rise buildings
Design of Sheet piles

References
3. Leonards., “Foundation Engineering”.
5. Teng, Wayne. S. “Foundation Design”
DESIGN OF TALL STRUCTURES

UNIT 1:

UNIT 2:

UNIT 3:
Analysis and Design: Modeling for approximate analysis, accurate analysis and reduction techniques, analysis of building as total structural system considering overall integrity and major subsystem interaction, analysis for member forces; drift and twist, computerized general three dimensional analysis. Structural elements: sectional shapes, properties and resisting capacities, design, deflection, cracking, pre-stressing, shear flow. Design for differential movement, creep and shrinkage effects, temperature effects and fire.

UNIT 4:
Stability of Tall Buildings, overall buckling analysis of frames, wall frames, approximate methods, second order effects of gravity of loading, P-Delta analysis, simultaneous first order and P-Delta analysis, Transnational, Torsional instability, out of plum effects, stiffness of member in stability, effect of foundation rotation.

References
MASSONRY STRUCTURES

Subject Code: PSE014E
No. of Lecture Hours: 52
Maximum marks: 100

IA Marks: 50
Duration of Exam: 3 Hrs
Assignment – 02 hours/week

UNIT 1:
Introduction, Masonry units, materials and types, history of masonry, characteristics of Brick, stone, clay block, concrete block, stabilized, mud block masonry units – strength, modulus of elasticity and water absorption. Masonry materials – classification and properties of mortars, selection of mortars. Strength of masonry in compression, behaviour of masonry under compression, strength and elastic properties, influence of masonry unit and mortar characteristics, effect of masonry unit height on compressive strength, influence of masonry bonding patterns on strength, prediction of strength of masonry in Indian context, failure theories of masonry under compression. Effects of slenderness and eccentricity, effect of rate of absorption, effect of curing, effect of ageing, workmanship on compressive strength

UNIT 2:
Flexural strength and shear strength, bond between masonry unit and mortar, tests for determining flexural, shear and bond strengths, factors affecting bond strength, effect of bond strength on compressive strength, orthotropic strength properties of masonry in flexure, shear strength of masonry, test procedures for evaluating flexural and shear strength. Permissible stresses, stress reduction and shape reduction factors, increase in permissible stresses for eccentric, vertical and lateral loads.

UNIT 3:
Design of load bearing masonry buildings: Permissible compressive stress, stress reduction and shape reduction factors, increase in permissible stresses for eccentric, vertical and lateral loads, permissible tensile and shear stresses, effective height of walls and columns, opening in walls, effective length, effective thickness, slenderness ratio, eccentricity, load dispersion, arching action, lintels; wall carrying axial load, eccentric load with different eccentricity ratios, wall with openings, freestanding wall; design of load bearing masonry for buildings up to 3 to 8 storeys using BIS codal provisions.

UNIT 4:
Earthquake resistant masonry buildings: Behaviour of masonry during earthquakes, concepts and design procedure for earthquake resistant masonry, BIS codal provisions, masonry arches, domes and vaults, components and classification of masonry arches, domes and vaults, historical buildings, construction procedure. In-plane and out of plane behavior, behavior of masonry walls and piers: axial and flexure behavior of masonry buildings: unreinforced masonry buildings, importance of bands and corners and vertical reinforcement, reinforced masonry building- cyclic loading and ductility of masonry walls, behavior of infills in RC frames, strut action
References

REPAIR AND REHABILITATION OF STRUCTURES

Subject Code: PSE015E
IA Marks: 50
No. of Lecture Hours: 52
Duration of Exam: 3 Hrs
Maximum marks: 100
Assignment – 02 hours/week

UNIT 1:
Introduction: Causes of deterioration of concrete structures, diagnostic methods & analysis, preliminary investigations, experimental investigations using NDT, load testing, corrosion mapping and core drilling and other instrumental methods. Quality assurance for concrete construction, strength, permeability, thermal properties and cracking. Influence on serviceability and durability: Effects due to climate, temperature, chemicals, wear and erosion

UNIT 2:
Design and construction errors, corrosion mechanism, Effects of cover thickness and cracking, methods of corrosion protection, corrosion inhibitors, corrosion resistant steels, coatings, cathodic protection.

Maintenance and Repair Strategies: repair and rehabilitation, facets of maintenance, importance of maintenance, preventive measures on various aspects, inspection, assessment procedure for evaluating a damaged structure, causes of deterioration - testing techniques.

UNIT 3:
Materials for Repair: Special concretes and mortar, concrete chemicals, special elements for accelerated strength gain, expansive cement, polymer concrete, sulphur infiltrated concrete, ferro cement, fiber reinforced concrete.
Techniques for Repair: Rust eliminators and polymers coating for rebar during repair, foamed concrete, mortar and dry pack, vacuum concrete, shotcrete, epoxy injection, shoring and underpinning.

UNIT 4:
Examples of Repair to Structures: Repairs to overcome low member strength, deflection, cracking, chemical disruption, weathering wear, fire, leakage, marine exposure, engineered demolition techniques for dilapidated structures - case studies

References
CONSTRUCTION MANAGEMENT

Subject Code: PSE107E  
IA Marks: 50

No. of Lecture Hours: 52  
Duration of Exam: 3 Hrs

Examination of Marks: 100  
Assignment – hours/week: 02

UNIT 1:
Stages of construction - estimating, tendering, pricing and contracting, equipment planning and waiting line situations, inventory management.

Engineering economics and Economic feasibility – budget, break-even analysis, Balance sheets, cost benefit analysis, discounted cash flow, Life cycle costing, cost control optimization

UNIT 2:
Principles and practice of project management; work breakdown structures, critical path networks, PERT, resource charts, cost charts, S-curves, performance ratios Updating of plans - purpose, frequency and methods of updating, common causes of time and cost overruns and corrective measures.

UNIT 3:
Decision tree and decision analysis, construction simulation and simulation models, Appraisal of public investment projects, techno-economics of projects project investment analysis and decisions.

UNIT 4:
Quality control - concept of quality, quality of constructed structure, use of manuals and checklists for quality control, role of inspection, basics of statistical quality control, ISO standards.

Safety and health on project sites - accidents; their causes and effects, costs of accidents, occupational health problems in construction, organizing for safety and health, ISO standards

References Books:

3. Punmia B. C., Khandelwal K. K., “Project Planning and Control with CPM and PERT”, Laxmi Publication Private Ltd., New Delhi, 2004
MATRIX METHODS OF STRUCTURAL ANALYSIS

UNIT 1:
Review of the basic concepts: static and kinematic indeterminacy, linear and non-linear structural behavior, concepts of stiffness and flexibility, energy concepts, principle of minimum potential energy and minimum complementary energy.
Flexibility method: Introduction, transformation of information from system forces to element forces, application to trusses, continuous beams and portal frames.

UNIT 2:
Stiffness method: Introduction, stiffness matrix for trusses, beams and portal frames. Assembly of structure stiffness matrix by direct stiffness method, analysis of orthogonal and non-orthogonal skeletal structures, transformation of information from local to global axes and vice versa.

UNIT 3:
Stiffness matrices for grid and beam elements in three dimensions, transformation of displacements and forces from local to global axes, analysis of grid and space frames, basic concepts associated with computer implementation by stiffness method.

UNIT 4:
Effects of temperature change and lack of fit, numerical techniques for simultaneous equations, Gauss elimination and Cholesky methods and bandwidth consideration

References
ADVANCED DESIGN OF STEEL STRUCTURES

UNIT 1:
Plastic Methods of Analysis: Stress strain relation for steel, Formation of plastic hinges, redistribution of stress; Section modulus, Fully plastic moment for selected cross section shapes; Theorems of plastic collapse; Collapse load for frames; Factors affecting fully plastic moment of a section.
Plastic Methods of Design: Plastic design of continuous beams; Trial and error method; Method of combining mechanisms; Plastic moment distribution for design of portal frames and pitched roof frames; Design of continuous beams.

UNIT 2:
Design of Frames for Industrial Structures: Design of frames for gravity and wind loads.

UNIT 3:
Design of Bunkers, Silos and Chimneys: Design of bunkers, silos and chimneys.

UNIT 4:
Minimum weight design: Minimum weight design; Design for strong column-weak beam and strong beam-weak column; Theorems of minimum weight design.
Design of Light Gauge Structural Steel Sections: Design of light gauge structural steel sections for axial, flexural and combined axial compression and flexure.

References
1. Ram Chandra, “Design of Steel Structures”, Vol. II, Standard Book House, New Delhi,
NUMERICAL METHODS FOR CIVIL ENGINEERS

UNIT 1:
Introduction: Historical development of Numerical techniques, role in investigations, research and design in the field of civil engineering.
Development of algorithm/ flow charts for following methods for solution of linear Simultaneous equation: a) Gaussian elimination method b) Gauss-Jordan matrix inversion method c) Gauss-Siedel method d) Factorization method
Application of solution of linear system of equations to civil engineering problems: Construction planning, slope deflection method applied to beams, frames and truss analysis.

UNIT 2:
Application of root finding to civil engineering problems: Development of algorithm for Bisection method and Newton-Raphson method and its applications for solution of non linear algebraic and transcendental equations from problems in hydraulics, irrigation engineering, structural engineering and environmental engineering.
Application of numerical integration for solving simple beam problems: Development of algorithm for Trapezoidal rule and Simpson’s one third rule and its application for computation of area of BMD drawn for statically determinate beams.

UNIT 3:
New-Mark’s method for computation of slopes and deflections in statically determinate beams.
Development of algorithm and application of solution of ordinary differential equation to civil engineering problems by Euler’s method and Runge Kutta 4th order method

UNIT 4:
Application of finite difference technique in structural mechanics:
   i. Introduction, expression of derivatives by finite difference: backward differences, forward differences and central differences.
   ii. Application of finite difference method for analysis of statically determinate indeterminate beams
Application of Finite difference technique in structural mechanics (Contd..): Buckling of columns and Beams on elastic foundation.

Reference Books:
STRUCTURAL DESIGN OF FOUNDATIONS

Subject Code: PSE019E  IA Marks: 50
No. of Lecture Hours: 52  Duration of Exam: 3 Hrs
Examination of Marks: 100  Assignment – hours/week:02

UNIT: 1

UNIT: 2
Introduction to RC Design - Codal provisions: A review and A few examples.
Shallow Foundations: Geotechnical and Structural Design of Individual footings, Combined footings, Rafts, Ring foundations, etc. Detailing, Examples and Case Studies.
Beams and Plates on Elastic Foundation:

UNIT: 3
Foundations for Retaining Structures: Examples and Case Studies.

UNIT: 4
Special Foundations: Towers, Chimneys, High-Rise Buildings, Power Plants, etc.
Earthquake Resistant Design of Foundations – A few Examples and Case Studies.
Usage of Softwares.

References


DESIGN STUDIO

Subject Code: PSE303D CIE Marks: 50
SEE Marks: 100 Contact Hours – hours/week:02
Credits: 4 (Four)


Complete report to be submitted at the end of the semester. CIE and SEE are evaluated by the committee.