

SEMESTER-II

S. No.	Course code	Subject	L	T	P	Total	Evaluation		Cr.	Duration of Exam (Hrs.)
							Mid Sem	End Sem		
1	MTSE- 102 A	FEM in Structural Engineering	3	-	-	3	40	60	3	3
2	MTSE-104 A	Structural Dynamics	3	-	-	3	40	60	3	3
3	*	Program Elective-III	3	-	-	3	40	60	3	3
4	**	Program Elective-IV	3	-	-	3	40	60	3	3
5	MTSE-122 A	Model Testing Lab		-	2	2	40	60	2	3
6	MTSE- 124 A	Numerical Analysis Lab	-	-	2	2	40	60	2	3
7	MTSE- 126 A	Mini Project	-	-	4	2	40	60	2	3
8	***	Audit Course-II	2			0	100		0	3
TOTAL			14		8	18	280	420	18	
							700			

*Program Elective - III		**Program Elective – IV	
MTSE-106 A	Advanced Steel Design	MTSE-114 A	Design of Advanced Concrete Structures
MTSE-108 A	Design of Formwork	MTSE-116 A	Advanced Design of Foundations
MTSE-110 A	Design of High Rise Structures	MTSE-118 A	Soil Structure Interaction
MTSE-112 A	Design of Masonry Structures	MTSE-120 A	Design of Industrial Structure

*** Audit Course - II	
MTAD-102 A	Constitution of India
MTAD-104 A	Pedagogy Studies
MTAD-106 A	Stress Management by Yoga
MTAD-108 A	Personality Development through Life Enlightenment Skills.

Note: 1. The course of program elective will be offered at 1/3rd or 6 numbers of students (whichever is smaller) strength of the class.

2. ***Along with the credit course, a student may normally be permitted to take audit course, however for auditing a course; prior consent of the course coordinator of the course is required. These courses shall not be mentioned for any award/calculation of SGPA/CGPA in the DMC. A certificate of successful completion of the audit course will be issued by the Director/Head of institution.

Finite Element Method in Structural Engineering								
MTSE-102 A	Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
	3	0	0	3	60	40	100	3 Hrs.
Course Outcomes (CO)								
CO1	<i>Use Finite Element Method for structural analysis.</i>							
CO2	<i>Execute the Finite Element Program/ Software</i>							
CO3	<i>Solve continuum problems using finite element analysis</i>							

Unit I

Introduction: History and Applications. Spring and Bar Elements, Minimum Potential Energy Principle, Direct Stiffness Method, Nodal Equilibrium equations, Assembly of Global Stiffness Matrix, Element Strain and Stress

Unit II

Beam Elements: Flexure Element, Element Stiffness Matrix, Element Load Vector.

Method of Weighted Residuals: Galerkin Finite Element Method, Application to Structural Elements, Interpolation Functions, Compatibility and Completeness Requirements, Polynomial Forms, Applications

Unit III

Types: Triangular Elements, Rectangular Elements, Three-Dimensional Elements, Isoparametric Formulation, Axi-Symmetric Elements, Numerical Integration, Gaussian Quadrature

Unit IV

Application to Solid Mechanics: Plane Stress, CST Element, Plane Strain Rectangular Element, Isoparametric Formulation of the Plane Quadrilateral Element, Axi- Symmetric Stress Analysis, Strain and Stress Computations.

Computer Implementation of FEM procedure, Pre-Processing, Solution, Post-Processing, Use of Commercial FEA Software.

References:

- 1) Finite Element Analysis, Seshu P., Prentice-Hall of India, 2005.
- 2) Concepts and Applications of Finite Element Analysis, Cook R. D., Wiley J., New York, 1995.
- 3) Fundamentals of Finite Element Analysis, Hutton David, Mc-Graw Hill, 2004
- 4) Finite Element Analysis, Buchanan G.R., McGraw Hill Publications, New York, 1995
- 5) Finite Element Method, Zienkiewicz O.C. & Taylor R.L. Vol. I, II & III, Elsevier, 2000
- 6) Finite Element Methods in Engineering, Belegundu A.D., Chandrupatla, T.R., Prentice Hall India, 1991

MTSE-104 A							
Structural Dynamics							
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
3	0	0	3	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Analyze and study dynamics response of single degree freedom system using fundamental theory and equation of motion.</i>						
CO2	<i>Analyze and study dynamics response of Multi degree freedom system using fundamental theory and equation of motion</i>						
CO3	<i>Use the available software for dynamic analysis</i>						

Unit I

Introduction: Objectives, Importance of Vibration Analysis, Nature of Exciting Forces, Mathematical Modeling of Dynamic Systems.

Unit II

Single Degree of Freedom System: Free and Forced Vibration with and without Damping, Response to Harmonic Loading, Response to General Dynamic Loading using Duhamel's Integral, Fourier Analysis for Periodic Loading, State Space Solution for Response.

Numerical Solution to Response using Newmark Method and Wilson Method, Numerical Solution for State Space Response using Direct Integration.

Unit III

Multiple Degree of Freedom System (Lumped parameter): Two Degree of Freedom System, Multiple Degree of Freedom System, Inverse Iteration Method for Determination of Natural Frequencies and Mode Shapes, Dynamic Response by Modal Superposition Method, Direct Integration of Equation of Motion.

Unit IV

Multiple Degree of Freedom System (Distributed Mass and Load): Single Span Beams, Free and Forced Vibration, Generalized Single Degree of Freedom System

Special Topics in Structural Dynamics (Concepts only): Dynamic Effects of Wind Loading, Moving Loads, Vibrations caused by Traffic, Blasting and Pile Driving, Foundations for Industrial Machinery, Base Isolation.

References:

- 1) Dynamics of Structures, Clough R. W. and Penzien J., McGraw Hill.
- 2) Structural Dynamics and Introduction to Earthquake Engineering, Chopra A. K.
- 3) Vibration of Structures - Application in Civil Engineering Design, Smith J. W., Chapman and Hall
- 4) Dynamics of Structures, Humar J. L., Prentice Hall.
- 5) Structural Dynamics - Theory and Computation, Paz Mario, CBS Publishers
- 6) Dynamics of Structures, Hart and Wong

MTSE-122 A		Model Testing Lab					
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
0	0	2	2	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Understand the response of structures.</i>						
CO2	<i>Prepare the models</i>						
CO3	<i>Conduct model testing for static loading.</i>						
CO4	<i>Conduct model testing for free and forced vibrations</i>						

Syllabus Content:

1. Response of structures and its elements against extreme loading events.
2. **Model Testing:** Static - testing of plates, shells, and frames models.
3. **Model Testing:** Free and forced vibrations, Evaluation of dynamic modulus.
4. Beam vibrations, Vibration isolation, Shear wall building model, Time and frequency-domain study, Vibration Characteristics of RC Beams using Piezoelectric Sensors etc.

MTSE-124 A		Numerical Analysis Lab					
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
0	0	2	2	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Find Roots of non-linear equations by Bisection method and Newton's method.</i>						
CO2	<i>Do curve fitting by least square approximations.</i>						
CO3	<i>Solve the system of Linear Equations using Gauss - Elimination/ Gauss - Seidal Iteration/ Gauss - Jordan Method</i>						
CO4	<i>To Integrate Numerically Using Trapezoidal and Simpson's Rules</i>						
CO5	<i>To Find Numerical Solution of Ordinary Differential Equations by Euler's Method, Runge- Kutta Method</i>						

List of Experiments:

1. Find the Roots of Non-Linear Equation Using Bisection Method.
2. Find the Roots of Non-Linear Equation Using Newton's Method.
3. Curve Fitting by Least Square Approximations.
4. Solve the System of Linear Equations Using Gauss - Elimination Method.
5. Solve the System of Linear Equations Using Gauss - Seidal Iteration Method.
6. Solve the System of Linear Equations Using Gauss - Jordan Method.
7. Integrate numerically using Trapezoidal Rule.
8. Integrate numerically using Simpson's Rules.
9. Numerical Solution of Ordinary Differential Equations By Euler's Method.
10. Numerical Solution of Ordinary Differential Equations By Runge- Kutta Method.

MTSE-126 A	Mini Project						
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
0	0	4	2	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Identify structural engineering problems reviewing available literature</i>						
CO2	<i>Study different techniques used to analyze complex structural systems.</i>						
CO3	<i>Work on the solutions given and present solution by using his/her technique applying engineering principles.</i>						

Syllabus Content:

Mini Project will have mid semester presentation and end semester presentation. Mid semester presentation will include identification of the problem based on the literature review on the topic referring to latest literature available.

End semester presentation should be done along with the report on identification of topic for the work and the methodology adopted involving scientific research, collection and analysis of data, determining solutions highlighting individuals' contribution.

Continuous assessment of Mini Project at Mid Semester and End Semester will be monitored by the departmental committee.

Program Elective -III

MTSE-106 A	Advanced Steel Design						
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
3	0	0	3	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Design steel structures/ components by different design processes</i>						
CO2	<i>Analyze and design beams and columns for stability and strength, and drift</i>						
CO3	<i>Design welded and bolted connections</i>						

Unit 1

Properties of Steel: Mechanical Properties, Hysteresis, Ductility.

Unit 2

Hot Rolled Sections: compactness and non-compactness, slenderness, residual stresses.

Unit 3

Design of Steel Structures: Inelastic Bending Curvature, Plastic Moments, Design Criteria Stability, Strength, Drift.

Unit 4

Stability of Beams: Local Buckling of Compression Flange & Web, Lateral Torsional Buckling.

Unit 5

Stability of Columns: Slenderness Ratio, Local Buckling of Flanges and Web, Bracing of Column about Weak Axis.

Unit 6

Method of Designs: Allowable Stress Design, Plastic Design, Load and Resistance Factor Design;

Unit 7

Strength Criteria: Beams - Flexure, Shear, Torsion, Columns - Moment Magnification Factor, Effective Length PM Interaction, Biaxial Bending, Joint Panel Zones.

Unit 8

Drift Criteria: P Effect, Deformation Based Design

Unit 9

Connections: Welded, Bolted, Location Beam Column, Column Foundation, Splices.

References:

- 1) Design of Steel Structures - Vol. II, Ramchandra. Standard Book House, Delhi
- 2) Design of Steel Structures - Arya A. S., Ajmani J. L., Nemchand and Bros., Roorkee
- 3) The Steel Skeleton- Vol. II, Plastic Behaviour and Design - Baker J. F., Horne M. R., Heyman J., ELBS
- 4) Plastic Methods of Structural Analysis, Neal B. G., Chapman and Hall London
- 5) IS 800: 2007 – General Construction in Steel - Code of Practice, BIS, 2007
- 6) SP – 6 - Handbook of Structural Steel Detailing, BIS, 1987

Program Elective -III

MTSE-108 A	Design of Formwork						
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
3	0	0	3	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Select proper formwork, accessories and material</i>						
CO2	<i>Design the form work for Beams, Slabs, columns, Walls and Foundations</i>						
CO3	<i>Design the form work for Special Structures</i>						
CO4	<i>Understand the working of flying formwork</i>						
CO5	<i>Judge the formwork failures through case studies</i>						

Unit 1

Introduction: Requirements and Selection of Formwork

Unit 2

Formwork Materials- Timber, Plywood, Steel, Aluminium, Plastic, and Accessories. Horizontal and Vertical Formwork Supports

Unit 3

Formwork Design: Concepts, Formwork Systems and Design for Foundations, Walls, Columns, Slab and Beams

Unit 4

Formwork Design for Special Structures: Shells, Domes, Folded Plates, Overhead Water Tanks, Natural Draft Cooling Tower, Bridges

Unit 5

Flying Formwork: Table Form, Tunnel Form, Slip Form, Formwork for Precast Concrete, Formwork Management Issues –Pre- and Post-Award.

Unit 6

Formwork Failures: Causes and Case studies in Formwork Failure, Formwork Issues in Multi-Story Building Construction

References:

- 1) Formwork for Concrete Structures, Peurify, Mc Graw Hill India, 2015
- 2) Formwork for Concrete Structures, Kumar NeerajJha, Tata McGraw Hill Education, 2012
- 3) IS 14687: 1999, False workfor Concrete Structures - Guidelines, BIS

Program Elective -III

MTSE-110 A	Design of High Rise Structures						
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
3	0	0	3	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Analyze, design and detail Transmission/ TV tower, Mast and Trestles with different loading conditions</i>						
CO2	<i>Analyze, design and detail the RC and Steel Chimney</i>						
CO3	<i>Analyze. design and detail the tall buildings subjected to different loading conditions using relevant codes</i>						

Unit 1

Design of transmission/ TV tower, Mast and trestles: Configuration, bracing system, analysis and design for vertical transverse and longitudinal loads.

Unit 2

Analysis and Design of RC and Steel Chimney, Foundation design for varied soil strata.

Unit 3

Tall Buildings: Structural Concept, Configurations, various systems, Wind and Seismic loads, Dynamic approach, structural design considerations and IS code provisions. Firefighting design provisions

Unit 4

Application of software in analysis and design.

References:

- 1) Structural Design of Multi-storeyed Buildings, Varyani U. H., 2nd Ed., SouthAsian Publishers, New Delhi, 2002
- 2) Structural Analysis and Design of Tall Buildings, Taranath B. S., Mc Graw Hill, 1988
- 3) Illustrated Design of Reinforced Concrete Buildings (GF+3storeyed), Shah V. L. & Karve S. R., Structures Publications, Pune, 2013
- 4) Design of Multi Storeyed Buildings, Vol. 1 & 2, CPWD Publications, 1976
- 5) Tall Building Structures, Smith Byran S. and Coull Alex, Wiley India. 1991
- 6) High Rise Building Structures, Wolfgang Schueller, Wiley., 1971
- 7) Tall Chimneys, Manohar S. N., Tata Mc Graw Hill Publishing Company, New Delhi

Program Elective -III

MTSE-112 A	Design of Masonry Structures						
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
3	0	0	3	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Understand the masonry design approaches.</i>						
CO2	<i>Analyze Reinforced Masonry Members</i>						
CO3	<i>Determine interactions between members</i>						
CO4	<i>Determine shear strength and ductility of Reinforced Masonry members</i>						
CO5	<i>Check the stability of walls</i>						
CO6	<i>Perform elastic and Inelastic analysis of masonry walls</i>						

Unit-I

Introduction: Historical Perspective, Masonry Materials, Masonry Design Approaches, Overview of Load Conditions, Compression Behaviour of Masonry, Masonry Wall Configurations, Distribution of Lateral Forces

Unit-II

Flexural Strength of Reinforced Masonry Members: In plane and Out-of-plane Loading

Unit-III

Interactions: Structural Wall, Columns and Pilasters, Retaining Wall, Pier and Foundation

Unit-IV

Shear Strength and Ductility of Reinforced Masonry Members

Unit-V

Prestressed Masonry - Stability of Walls, Coupling of Masonry Walls, Openings, Columns, Beams

Unit-VI

Elastic and Inelastic Analysis, Modeling Techniques, Static Push-Over Analysis and use of Capacity Design Spectra

References Books:

- 1) Design of Reinforced Masonry Structures, Narendra Taly, ICC, 2nd Edn
- 2) Masonry Structures: Behavior and Design, Hamid Ahmad A. and Drysdale Robert G., 1994
- 3) Mechanics of Masonry Structures, Editor: Maurizio Angelillo, 2014
- 4) Earthquake-resistant Design of Masonry Buildings, Toma evi Miha, Imperial College Press, 1999

Program Elective -IV

MTSE-114 A	Design of Advanced Concrete Structures						
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
3	0	0	3	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Analyze the special structures by understanding their behaviour</i>						
CO2	<i>Design and prepare detail structural drawings for execution citing relevant IS codes</i>						

Unit-I

Design philosophy, Modeling of Loads, Material Characteristics

Unit-II

Reinforced Concrete - P-M, M-phi Relationships, Strut-and- Tie Method, Design of Deep Beam and Corbel, Design of Shear Walls, Compression Field Theory for Shear Design, Design against Torsion; IS, ACI and Eurocode

Unit-III

Steel Structures -- Stability Design, Torsional Buckling - Pure, Flexural and Lateral, Design of Beam-Columns, Fatigue Resistant Design, IS code, AISC Standards and Eurocode

References Books:

- 1) Reinforced Concrete Design, Pillai S. U. and Menon D., Tata McGraw-Hill, 3rd Ed, 1999
- 2) Design of Steel Structures, Subramaniam N., Oxford University Press, 2008
- 3) Reinforced Concrete Structures, Park R. and Paulay T., John Wiley & Sons, 1995
- 4) Advanced Reinforced Concrete Design, Varghese P. C., Prentice Hall of India, New Delhi
- 5) Unified Theory of Concrete Structures, Hsu T. T. C. and Mo Y. L., John Wiley & Sons, 2010
- 6) Steel Structures Design and Behavior Emphasizing Load and Resistance Factor Design, Salmon C. G., Johnson J. E. and Malhas F. A., Pearson Education, 5th Ed, 2009
- 7) Design of Steel Structures - Vol. II, Ramchandra. Standard Book House, Delhi
- 8) Plastic Methods of Structural Analysis, Neal B.G., Chapman and Hall London

Program Elective -IV

MTSE-116 A	Advanced Design of Foundation						
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
3	0	0	3	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	Decide the suitability of soil strata for different projects						
CO2	Design shallow foundations deciding the bearing capacity of soil						
CO3	Analyze and design the pile foundation						
CO4	Understand analysis methods for well foundation						

Unit-I

Planning of Soil Exploration for Different Projects, Methods of Subsurface Exploration, Methods of Borings along with Various Penetration Tests

Unit-II

Shallow Foundations, Requirements for Satisfactory Performance of Foundations, Methods of Estimating Bearing Capacity, Settlements of Footings and Rafts, Proportioning of Foundations using Field Test Data, Pressure - Settlement Characteristics from Constitutive Laws

Unit-III

Pile Foundations, Methods of Estimating Load Transfer of Piles, Settlements of Pile Foundations, Pile Group Capacity and Settlement, Laterally Loaded Piles, Pile Load Tests, Analytical Estimation of Load- Settlement Behavior of Piles, Proportioning of Pile Foundations, Lateral and Uplift Capacity of Piles

Unit-IV

Well Foundation, IS and IRC Code Provisions, Elastic Theory and Ultimate Resistance Methods

Unit-V

Tunnels and Arching in Soils, Pressure Computations around Tunnels

Unit-VI

Open Cuts, Sheet piling and Bracing Systems in Shallow and Deep Open Cuts in Different Soil Types

Unit-VII

Coffer Dams, Various Types, Analysis and Design, Foundations under uplifting loads, Soil-structure interaction

Reference Books

- 1) Design of foundation system, N.P. Kurian, Narosa Publishing House
- 2) Foundation Analysis and Design, J. E. Bowles, Tata McGraw Hill New York
- 3) Analysis and Design of Substructures, Sawmi Saran, Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi

Program Elective -IV

MTSE-118 A	Soil Structure Interaction						
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
3	0	0	3	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Understand soil structure interaction concept and complexities involved</i>						
CO2	<i>Evaluate soil structure interaction for different types of structure under various conditions of loading and subsoil characteristics</i>						
CO3	<i>Prepare comprehensive design oriented computer programs for interaction problems based on theory of sub grade reaction such as beams, footings, rafts etc</i>						
CO4	<i>Analyze different types of frame structure founded on stratified natural deposits with linear and non-linear stress-strain characteristics</i>						
CO5	<i>Evaluate action of group of piles considering stress-strain characteristics of real soils</i>						

Unit- I

Critical Study of Conventional Methods of Foundation Design, Nature and Complexities of Soil Structure Interaction

Unit- II

Application of Advanced Techniques of Analysis such as FEM and Finite Difference Method.

Relaxation and Interaction for the Evaluation of Soil Structure Interaction for Different Types of Structure under various Conditions of Loading and Subsoil Characteristics

Unit -III

Preparation of Comprehensive Design Oriented Computer Programs for Specific Problems, Interaction Problems based on Theory of Sub Grade Reaction Such as Beams, Footings, Rafts Etc.

Unit- IV

Analysis of Different Types of Frame Structures Founded on Stratified Natural Deposits with Linear and Non-Linear Stress-Strain Characteristics.

Unit- V

Determination of Pile Capacities and Negative Skin Friction, Action of Group of Piles Considering Stress-Strain Characteristics of Real Soils, Anchor Piles and Determination of Pullout Resistance

References:

- 1) Analytical and Computer Methods in Foundation, Bowels J.E., McGraw Hill Book Co., New York, 1974
- 2) Numerical Methods in Geotechnical Engineering, Desai C.S. and Christian J.T., McGraw Hill Book Co., New York
- 3) Soil Structure Interaction - The real behaviour of structures, Institution of Structural Engineers
- 4) Elastic Analysis of Soil Foundation Interaction, Developments in Geotechnical Engg. Vol-17, Elsevier Scientific Publishing Company
- 5) Elastic Analysis of Soil-Foundation Interaction, Selvadurai A.P.S., Elsevier Scientific Publishing Company
- 6) Analysis & Design of substructures, Swami Saran, Oxford & IBH Publishing Co. Pvt. Ltd.
- 7) Design of Foundation System- Principles & Practices, Kurian N. P., Narosa Publishing

Program Elective -IV

MTSE-120 A	Design of Industrial Structure						
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
3	0	0	3	60	40	100	3 Hrs.
Course Outcomes (CO)							
CO1	<i>Design Steel Gantry Girders</i>						
CO2	<i>Design Steel Portal, Gable Frames</i>						
CO3	<i>Design Steel Bunkers and Silos</i>						
CO4	<i>Design Chimneys and Water Tanks</i>						

Unit I

Steel Gantry Girders – Introduction, loads acting on gantry girder, permissible stress, types of gantry girders and crane rails, crane data, maximum moments and shears, construction detail, design procedure

Unit II

Portal Frames – Design of portal frame with hinge base, design of portal frame with fixed base - Gable Structures – Lightweight Structures

Unit III

Steel Bunkers and Silos – Design of square bunker – Jansen’s and Airy’s theories – IS Code provisions – Design of side plates – Stiffeners – Hooper – Longitudinal beams Design of cylindrical silo – Side plates – Ring girder – stiffeners

Unit IV

Chimneys – Introduction, dimensions of steel stacks, chimney lining, breech openings and access ladder, loading and load combinations, design considerations, stability consideration, design of base plate, design of foundation bolts, design of foundation

Unit V

Water Tanks – Design of rectangular riveted steel water tank – Tee covers – Plates – Stays – Longitudinal and transverse beams – Design of staging – Base plates – Foundation and anchor bolts

Unit VI

Design of pressed steel water tank – Design of stays – Joints – Design of hemispherical bottom water tank – side plates – Bottom plates – joints – Ring girder – Design of staging and foundation

References:

- 1) Design of Steel Structure, Punmia B. C., Jain Ashok Kr., Jain Arun Kr., 2nd Ed., Lakshmi Publishers, 1998
- 2) Design of Steel Structures, Ram Chandra, 12th Ed., Standard Publishers, 2009.
- 3) Design of Steel Structures, Subramaniam

Audit II

MTAD-102 A		Constitution of India					
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
2	0	0	0	-	100	100	3 Hrs.
Program Objective (PO)	<i>Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective and to address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.</i>						
Course Outcomes (CO)							
CO1	<i>Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.</i>						
CO2	<i>Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.</i>						
CO3	<i>Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.</i>						
CO4	<i>Discuss the passage of the Hindu Code Bill of 1956.</i>						

Unit I

History of Making of the Indian Constitution: History, Drafting Committee, (Composition & Working) Philosophy of the Indian Constitution: Preamble, Salient Features

Unit 2

Contours of Constitutional Rights & Duties: Fundamental Rights , Right to Equality , Right to Freedom , Right against Exploitation , Right to Freedom of Religion, Cultural and Educational Rights , Right to Constitutional Remedies , Directive Principles of State Policy , Fundamental Duties.

Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor , Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications. Powers and Functions

Unit 3

Local Administration: District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative CEO of Municipal Corporation, Panchayati raj: Introduction, PRI: ZilaPanchayat, Elected officials and their roles, CEO ZilaPanchayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy

Unit 4

Election Commission: Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.

References

- 1) The Constitution of India, 1950 (Bare Act), Government Publication.
- 2) Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
- 3) M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
- 4) D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

Audit-II

Pedagogy Studies							
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
2	0	0	0	-	100	100	3 Hrs.
Program Objective (PO)	<i>Review existing evidence on the review topic to inform programme design and policy making undertaken by the DFID, other agencies and researchers and Identify critical evidence gaps to guide the development.</i>						
Course Outcomes (CO)							
CO1	<i>What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?</i>						
CO2	<i>What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?</i>						
CO3	<i>How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?</i>						
CO4	<i>What is the importance of identifying research gaps?</i>						

Unit I

Introduction and Methodology: Aims and rationale, Policy background, Conceptual framework and terminology, Theories of learning, Curriculum, Teacher education., Conceptual framework, Research questions. Overview of methodology and Searching. Thematic overview: Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries. , Curriculum, Teacher education.

Unit II

Evidence on the effectiveness of pedagogical practices, Methodology for the in depth stage: quality assessment of included studies. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? Theory of change. Strength and nature of the body of evidence for effective pedagogical practices. Pedagogic theory and pedagogical approaches. Teachers' attitudes and beliefs and Pedagogic strategies.

Unit III

Professional development: alignment with classroom practices and follow-up support, Peer support from the head teacher and the community. Curriculum and assessment, Barriers to learning: limited resources and large class sizes,

Unit IV

Research gaps and future directions: Research design, Contexts, Pedagogy, Teacher education Curriculum and assessment, Dissemination and research impact.

References

- 1) Ackers J, Hardman F (2001) Classroom interaction in Kenyan primary schools, Compare, 31 (2): 245-261.
- 2) Agrawal M (2004) Curricular reform in schools: The importance of evaluation, Journal of Curriculum Studies, 36 (3): 361-379.
- 3) Akyeampong K (2003) Teacher training in Ghana - does it count? Multi-site teacher education research project (MUSTER) country report 1. London: DFID.
- 4) Akyeampong K, Lussier K, Pryor J, Westbrook J (2013) Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? International Journal Educational Development, 33 (3): 272-282.
- 5) Alexander RJ (2001) Culture and pedagogy: International comparisons in primary education. Oxford and Boston: Blackwell.
- 6) Chavan M (2003) Read India: A mass scale, rapid, 'learning to read' campaign.

Audit II

MTAD-106 A	Stress Management by Yoga						
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
2	0	0	0	-	100	100	3 Hrs.
Program Objective (PO)	To achieve overall health of body and mind and to overcome stress						
Course Outcomes (CO)							
CO1	<i>Develop healthy mind in a healthy body thus improving social health.</i>						
CO2	<i>Improve efficiency</i>						
CO3	<i>Learn the Yog asan</i>						
CO4	<i>Learn the pranayama</i>						

Unit I

Definitions of Eight parts of yog (Ashtanga).

Unit II

Yam and Niyam, Do's and Don't's in life; Ahinsa, satya, astheya, bramhacharya and aparigraha; Shaucha, santosh, tapa, swadhyay, ishwarpranidhan.

Unit III

Asan and Pranayam, Various yog poses and their benefits for mind & body,

Unit IV

Regularization of breathing techniques and its effects-Types of pranayam.

References

- 1) 'Yogic Asanas for Group Training-Part-I' :Janardan Swami Yogabhyasi Mandal, Nagpur
- 2) "Rajayoga or conquering the Internal Nature" by Swami Vivekananda, AdvaitaAshrama (Publication Department), Kolkata

Audit II

MTAD-108 A Personality Development through Life Enlightenment Skills							
Lecture	Tutorial	Practical	Credit	End Sem. Evaluation	Mid Sem. Evaluation	Total	Time
2	0	0	0	-	100	100	3 Hrs.
Program Objective (PO)	To learn to achieve the highest goal happily To become a person with stable mind, pleasing personality and determination To awaken wisdom in students						
Course Outcomes (CO)							
CO1	<i>Students become aware about leadership.</i>						
CO2	<i>Students will learn how to perform his/her duties in day to day work.</i>						
CO3	<i>Understand the team building and conflict</i>						
CO4	<i>Student will learn how to become role model for the society.</i>						

Unit I

Neetisatakam-Holistic development of personality: Verses: 19, 20, 21, 22 (wisdom); Verses: 29, 31, 32 (pride & heroism); Verses: 26, 28, 63, 65 (virtue); Verses: 52, 53, 59 (don's); Verses: 71, 73, 75, 78 (do's).

Unit II

Approach to day to day work and duties; Shrimad Bhagwad Geeta: Chapter-2: Verses: 41, 47, 48; Chapter-3: Verses: 13, 21, 27, 35; Chapter-6: Verses: 5, 13, 17, 23, 35; Chapter-18: Verses: 45, 46, 48.

Unit III

Statements of basic knowledge; Shrimad Bhagwad Geeta: Chapter-2: Verses: 56, 62, 68; Chapter-12: Verses: 13, 14, 15, 16, 17, 18.

Unit IV

Personality of Role model; Shrimad Bhagwad Geeta: Chapter-2: Verses: 17; Chapter-3: Verses: 36, 37, 42; Chapter-4: Verses: 18, 38, 39; Chapter-18: Verses: 37, 38, 63.

References:

- 1) Srimad Bhagavad Gita, Swami Swarupananda Advaita Ashram (Publication Department), Kolkata.
- 2) Bhartrihari's Three Satakam (Niti-sringar-vairagya), P. Gopinath, Rashtriya Sanskrit Sansthanam, New Delhi.