2019-20

Techno India NJR Institute of Technology
Academic Administration of Techno NJR Institute
Syllabus Deployment

Name of Faculty	: Mr. Hitkaran Singh Ranawat	Subject Code: 3CE1-02
Subject	: Technical Communication	
Department	: Civil Engineering	Sem: III
Total No. of Lectures Planned: 26		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: To have practical exposure to the basic language techniques in professional environment.

CO2: Develop Skills of listening, reading.

CO3: To develop communication and employability skills.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION TO TECHNICAL COMMUNICATION-** Definition of technical communication,
2	1	Aspects of Technical Communication, Forms of Technical Communication, Importance Of Technical Communication
3	1	Technical Communication Skills (Listening, Speaking, Writing, Reading Writing
4	1	Linguistic Ability, Style In Technical Communication
5	**2**	**COMPREHENSION OF TECHNICAL MATERIALS/TEXTS AND INFORMATION DESIGN & DEVELOPMENT-** Reading of technical texts
6	2	Reading And Comprehending Instructions And Technical Manuals, Interpreting And Summarizing Technical Texts

7	2	Note-Making. Introduction Of Different Kinds Of Technical Documents
8	2	Information Collection, Factors Affecting Information And Document Design
9	2	Strategies For Organization, Information Design And Writing For Print & Online Media
10	**3**	**TECHNICAL WRITING, GRAMMAR AND EDITING-** Technical writing process
11	3	Forms Of Technical Discourse, Writing, Drafts And Revising
12	3	Basics Of Grammar, Common Error In Writing And Speaking
13	3	Study Of Advanced Grammar, Editing Strategies To Achieve Appropriate Technical Style
14	3	Introduction To Advanced Technical Communication
15	3	Planning, Drafting And Writing Official Notes
16	3	Planning, Drafting And Writing Official Notes
17	3	Letters, E-Mail, Resume, Job Application, Minutes Of Meetings
18	3	Letters, E-Mail, Resume, Job Application, Minutes Of Meetings
19	**4**	**ADVANCED TECHNICAL WRITING-** Technical Reports
20	4	Types Of Technical Reports, Characteristics & Formats And Structure Of Technical Reports
21	4	Technical Project Proposals, Types Of Technical Proposals
22	4	Characteristics & Formats And Structure Of Technical Proposals
23	4	Technical Articles, Types Of Technical Articles
24	4	Types Of Technical Articles
25	4	Writing Strategies, Structure And Formats Of Technical Articles
26	4	Writing Strategies, Structure And Formats Of Technical Articles

TEXT/REFERENCE BOOKS

1. Communication Skills for Engineers and Scientists, Sangeeta Sharma & Binod Mishra, PHI Learning Pvt. Ltd.
2. English for Engineers: Made Easy, Aeda Abidi & Ritu Chaudhary, Cengage Learning, (New Delhi)
3. A Practical Course for Developing Writing Skills in English, J.K. Gangal, PHI Learning Pvt. Ltd., New Delhi.

7	2	Note-Making. Introduction Of Different Kinds Of Technical Documents
8	2	Information Collection, Factors Affecting Information And Document Design
9	2	Strategies For Organization, Information Design And Writing For Print & Online Media
10	**3**	**TECHNICAL WRITING, GRAMMAR AND EDITING-** Technical writing process
11	3	Forms Of Technical Discourse, Writing, Drafts And Revising
12	3	Basics Of Grammar, Common Error In Writing And Speaking
13	3	Study Of Advanced Grammar, Editing Strategies To Achieve Appropriate Technical Style
14	3	Introduction To Advanced Technical Communication
15	3	Planning, Drafting And Writing Official Notes
16	3	Planning, Drafting And Writing Official Notes
17	3	Letters, E-Mail, Resume, Job Application, Minutes Of Meetings
18	3	Letters, E-Mail, Resume, Job Application, Minutes Of Meetings
19	**4**	**ADVANCED TECHNICAL WRITING-** Technical Reports
20	4	Types Of Technical Reports, Characteristics & Formats And Structure Of Technical Reports
21	4	Technical Project Proposals, Types Of Technical Proposals
22	4	Characteristics & Formats And Structure Of Technical Proposals
23	4	Technical Articles, Types Of Technical Articles
24	4	Types Of Technical Articles
25	4	Writing Strategies, Structure And Formats Of Technical Articles
26	4	Writing Strategies, Structure And Formats Of Technical Articles

TEXT/REFERENCE BOOKS

1. Communication Skills for Engineers and Scientists, Sangeeta Sharma & Binod Mishra, PHI Learning Pvt. Ltd.
2. English for Engineers: Made Easy, Aeda Abidi & Ritu Chaudhary, Cengage Learning, (New Delhi)
3. A Practical Course for Developing Writing Skills in English, J.K. Gangal, PHI Learning Pvt. Ltd., New Delhi.

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mrs. Payal Jain	Subject Code: 3CE2-01
Subject	: Advance Engineering Mathematics-I	
Department	: Civil Engineering	Sem: III
Total No. of Lectures Planned: 40		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: Apply a range of mathematical theorems and methods to solve routine and complex analytic and applied problems

CO2: Analyse data necessary for the solution of engineering problems

CO3: Examine the effectiveness of proposed solutions to identified engineering problems.

Lecture No.	Unit	Topic
1	1	**NUMERICAL METHODS – 1:** Finite differences, Relation between operators
2	1	Interpolation Using Newton's Forward And Backward Difference Formulae
3	1	Interpolation Using Newton's Forward And Backward Difference Formulae
4	1	Gauss's Forward And Backward Interpolation Formulae
5	1	Gauss's Forward And Backward Interpolation Formulae
6	1	Stirling's Formulae
7	1	Interpolation With Unequal Intervals: Newton's Divided Difference And Lagrange's Formulae
8	1	Interpolation With Unequal Intervals: Newton's Divided Difference And Lagrange's Formulae

9	1	Numerical Differentiation, Numerical Integration: Trapezoidal Rule And Simpson's 1/3rd And 3/8 Rules
10	1	Numerical Differentiation, Numerical Integration: Trapezoidal Rule And Simpson's 1/3rd And 3/8 Rules
11	**2**	**NUMERICAL METHODS – 2:** Numerical solution of ordinary differential equations
12	2	Taylor's Series, Euler And Modified Euler's Methods
13	2	Taylor's Series, Euler And Modified Euler's Methods
14	2	Runge-Kutta Method Of Fourth Order For Solving First And Second Order Equations
15	2	Runge- Kutta Method Of Fourth Order For Solving First And Second Order Equations
16	2	Milne's And Adam's Predicator-Corrector Methods
17	2	Solution Of Polynomial And Transcendental Equations-Bisection Method
18	2	Solution Of Polynomial And Transcendental Equations-Bisection Method
19	2	Newton-Raphson Method And Regula-Falsi Method
20	2	Newton-Raphson Method And Regula-Falsi Method
21	**3**	**LAPLACE TRANSFORM:** Definition and existence of Laplace transform
22	3	Properties Of Laplace Transform And Formulae, Unit Step Function
23	3	Properties Of Laplace Transform And Formulae, Unit Step Function
24	3	Dirac Delta Function, Heaviside Function, Laplace Transform Of Periodic Functions
25	3	Dirac Delta Function, Heaviside Function, Laplace Transform Of Periodic functions
26	3	Finding Inverse Laplace Transform By Different Methods
27	3	Convolution Theorem. Evaluation Of Integrals By Laplace Transform
28	3	Convolution Theorem. Evaluation Of Integrals By Laplace Transform
29	3	Solving Odes By Laplace Transforms Method
30	3	Solving Odes By Laplace Transforms Method
31	**4**	**FOURIER TRANSFORM:** Fourier Complex, Sine and Cosine transform
32	4	Fourier Complex, Sine And Cosine Transform
33	4	Properties And Formulae, Inverse Fourier Transforms
34	4	Properties And Formulae, Inverse Fourier Transforms

35	4	Convolution Theorem, Application Of Fourier Transforms To Partial Ordinary Differential Equation
36	4	Convolution Theorem, Application Of Fourier Transforms To Partial Ordinary Differential Equation
37	**5**	**Z-TRANSFORM:** Definition, properties and formulae
38	5	Convolution Theorem
39	5	Inverse Z-Transform
40	5	Application Of Z-Transform To Difference Equation

TEXT/REFERENCE BOOKS

1. Engineering Maths Vol-I by Chandrika Prasad, Standard Publishers and Distributers.
2. Engineering Maths Vol-II by Chandrika Prasad, Standard Publishers and Distributers.
3. Higher Engineering Maths by Gaur & Kaul, Jaipur Publishing House.

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Bharat Kr. Suthar	Subject Code: 3CE3-04
Subject	: Engineering Mechanics	
Department	: Civil Engineering	Sem: III
Total No. of Lectures Planned: 28		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: Draw free body diagrams and determine the resultant of forces and/or moments. Determine the centroid and second moment of area of sections.

CO2: Apply laws of mechanics to determine efficiency of simple machines with consideration of friction. Analyse statically determinate planar frames.

CO3: Apply Newton's laws and conservation laws to elastic collisions and motion of rigid bodies

Lecture No.	Unit	Topic
1	1	**INTRODUCTION:** Objective, scope and outcome of the course.
2	2	**STATICS OF PARTICLES AND RIGID BODIES:** Fundamental laws of mechanics, Principle of transmissibility
3	2	System of forces (conservative and non-conservative), Resultant force, Resolution of force
4	2	Moment and Couples, Resolution of a force into a force and a couple
5	2	Free body diagram, Equilibrium, Conditions for equilibrium, Lami's theorem
6	3	Plane trusses: Types of structures, Trusses, Support Conditions, Types of Loadings
7	3	Classification of trusses, Determinacy of trusses, Basic assumptions of truss analysis (zero force member, tension or compression member)

8	**3**	**METHOD OF JOINTS**
9	3	Method of sections
10	**4**	**CENTROID & MOMENT OF INERTIA** (M.I.): Location of centroid, Moment of inertia (mass and area)
11	4	Parallel axis and perpendicular axis theorems
12	4	M.I of composite section, M.I. of solid bodies
13	4	Polar moment of inertia, principle axis and principle moment of inertia
14	5	Virtual work: Principle of Virtual Work, Active forces boundaries
15	5	Active force diagram, Stability of equilibrium
16	**5**	**WORK, ENERGY AND POWER:** Work of a force, weight and couple, Power, Efficiency, Energy
17	5	Kinetic energy of rigid body, Principle of work and energy, Conservation of energy
18	**6**	**FRICTION:** Types of Friction, Laws of friction, Angle of friction, Angle of repose
19	6	Ladder, Wedge, Belt Friction
20	7	**SPRINGS:** Stiffness of springs, springs in series and parallel, Introduction to laminated plate springs
21	7	Leaf spring, close coiled helical springs, open coiled springs
22	**8**	**SIMPLE STRESSES AND STRAINS**: Concept of stress and strain in three dimensions
23	8	generalized Hooke's law; Young's modulus
24	8	Shear Stress, Shear Strain
25	8	Modulus of rigidity, Complementary shear stress
26	8	Poisson's ratio, Volumetric strain, Bulk modulus
27	8	Relation between elastic constants
28	8	Stress and strain thin cylinder and spherical cell under internal pressure

TEXT/REFERENCE BOOKS

1. Vector Mechanics for Engineers, Beer and Johnston, Tata McGraw-Hill.
2. Engineering Mechanics, Hibbeler, Pearson Education.
3. Engineering Mechanics, Meriam and Kraige, John Wiley & Sons.
4. Engineering Mechanics, Timoshenko and Young, Tata McGraw-Hill.
5. Engineering Mechanics, Shames, Pearson Education.

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Syllabus Deployment

Name of Faculty	: Mr. Nishant Sharma	Subject Code: 3CE4-05
Subject	: Surveying	
Department	: Civil Engineering	Sem: III
Total No. of Lectures Planned: 42		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: Identify, formulate, and solve surveying engineering problems, particularly the planning, design, establishing horizontal and vertical control, land use design, boundary determination, mapping and field layout of infrastructure.

CO2: Design and conduct experiments and to analyze and interpret data in engineering surveying, topographic surveying, geodetic surveying, and boundary surveying.

CO3: Understand the use of different surveying instruments and their use.

Lecture No.	Unit	Topic
1	1	**INTRODUCTION:** Objective, scope and outcome of the course
2	2	**LINEAR AND ANGULAR MEASUREMENTS:** Method of linear measurements, Correction to length measured with a chain/tape.
3	2	(Contd.) Correction to length measured with a chain/tape
4	2	Numerical based on Correction to length measured with a chain/tape
5	2	Ranging a survey line
6	2	Direct and indirect Angular measurement by compass, Designation of bearing.
7	2	Traversing with tape and compass, Correction to measured bearing

8	2	Numerical.
9	2	Angular measurement by theodolite; Temporary adjustments
10	2	Method of horizontal angle measurement
11	2	Method of vertical angle measurement
12	2	Numerical based on horizontal and vertical angle measurement
13	2	Traverse computation, plotting of traverse and determining the closing error
14	2	Balancing traverse, Numerical
15	2	Numerical based on Traversing
16	3	**LEVELLING:** Measurements of elevations methods of levelling; direct/differential, Indirect/Trigonometrical
17	3	Profile/Cross sectional levelling
18	3	Digital and Auto level
19	3	Errors in levelling & Numerical
20	3	contours and contour lines; methods of contouring; direct and indirect
21	3	(Contd.) methods of contouring; direct and indirect
22	3	Characteristics, uses, area and vol. measurements.
23	3	Numerical based on levelling
24	**4**	**CURVE SURVEYING:** Elements of simple and compound curves
25	4	Types of curves, Elements of circular, reverse, and transition curves
26	4	Method of setting out simple, circular, transition and reverse curves
27	4	Types of vertical curves, length of vertical curves
28	4	Setting out vertical curves. Tangent corrections
29	**5**	**TACHEOMETRY AND PHOTOGRAMMETRY SURVEYING:** Advantages of tachometric surveying, different systems of tachometric measurements
30	5	Stadia system of tachometry, distance elevation formulae for horizontal sights
31	5	Numerical
32	5	Determination of tachometric constants, distance and elevation formulae for inclined sights with staff vertical
33	5	Numerical
34	5	Introduction to basic concepts perspective geometry of aerial Photographs
35	5	Relief and tilt displacements
36	5	Terrestrial Photogrammetry, flight planning

37	6	**SETTING OUT WORKS & MODERN FIELD SURVEY SYSTEMS:** Instruments and methods for laying out buildings
38	6	Setting out culverts, setting out sewer lines
39	6	Numerical
40	6	Principle of E.D.M.(Electronic Distance Measurements)
41	6	Modulation, Types of E.D.M
42	6	Total station, parts of total station, advantages and application

TEXT/REFERENCE BOOKS

1. Surveying Volume I & II by Dr. B. C. Punmia, Laxmi Publications (P) Ltd.
2. Surveying Volume I & II by Dr. K.R. Arora, Standard Book House Delhi.
3. Surveying & Levelling by Subramanian Oxford University Press.

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Jitendra Choubisa	Subject Code: 3CE4-06
Subject	: Fluid Mechanics	
Department	: Civil Engineering	Sem: III
Total No. of Lectures Planned: 28		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: Solve the Hydrostatic problems.

CO2: Describe the physical properties of fluid.

CO3: Calculated the pressure distribution of incompressible fluid.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION TO OBJECTIVE, SCOPE AND OUTCOME OF THE COURSE.**
2	**2**	**FLUIDS**: Definition, Type of fluids, Ideal fluids, real fluids, Newtonian and Non-Newtonian fluids
3	**3**	**PROPERTIES OF FLUIDS:** Units of measurement, Mass density, Specific weight, Specific volume, Specific Gravity
4	3	Viscosity, Surface tension and Capillarity, Compressibility and Elasticity
5	**4**	**PRINCIPLES OF FLUID STATICS**: Basic equations, Pascal Law
6	4	Type of pressure:-atmospheric pressure, Gauge pressure, vacuum pressure, absolute pressure
7	4	Manometers, Bourdon pressure gauge

8	4	Manometers, Bourdon pressure gauge
9	**5**	**BUOYANCY**; Forces acting on immersed plane surface
10	5	Centre of pressure, forces on curved surfaces
11	5	Conditions of equilibrium for floating bodies
12	5	Meta-centre
13	5	Analytical determination of meta centric height
14	**6**	**KINEMATICS OF FLOW**: Visualisation of flow, Types of flow: Steady and unsteady, uniform and non-uniform, rotational and ir-rotaional flow, Laminar and turbulent flow
15	6	Streamline, path line, streak line, principle of conservation of mass, equation of continuity
16	6	Acceleration of fluid particles local and convective, velocity, acceleration
17	6	Velocity potential and stream function, elementary treatment of flow net
18	6	Fluid mass subject to horizontal and vertical acceleration and uniform rotation
19	7	**FLUID DYNAMICS**: Control volume approach
20	7	Euler's equation, Bernoulli's equation and its applications, venture-meter, orifice meter, orifices & mouthpieces
21	7	Pressure on flat plates and nozzles. Time of emptying of tanks by orifices
22	7	Momentum and angular momentum equations and their applications
23	**8**	**LAMINAR FLOW THROUGH PIPES**: Laminar flow through pipes
25	8	Relation between shear & pressure gradient. Flow between plates & pipes
26	8	Hagen- Poiseuille equation, Equations for velocity distribution
27	8	Pressure difference velocity distribution over a flat plate and in a pipe section
28	8	Darcy-Welsbach equation, friction factor , minor losses, pipe networks

TEXT/REFERENCE BOOKS

1. Fluid Mechanics by Modi & Seth, Standard Publishers, Delhi.
2. Fluid Mechanics by Dr. R.K. Bansal, Laxmi Publication (P) Ltd.
3. Fluid Mechanics by Dr. K.R. Arora, Standard Publishers and Distributers, Delhi.
4. Fluid Mechanics & Machinery by C.S.P.Ojha, R.Berndtsson and P.N.Chandramauli, Oxford Publishers, Delhi

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Syllabus Deployment

Name of Faculty	: Mr. Lokesh Puri Goswami	Subject Code: 3CE4-07
Subject	: Building Material & Construction	
Department	: Civil Engineering	Sem: III
Total No. of Lectures Planned: 42		

COURSE OUTCOMES HERE (4 OUTCOMES)

At the end of this course students will be able to:

CO1: Identify types of building and basic requirements of building components.

CO2: Describe types of doors, windows, arches and lintel.

CO3: Explain types of masonry, formwork, casting procedure and necessity of underpinning and scaffolding.

C04: Elucidate different types of flooring and roofing materials.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**BASIC CIVIL ENGINEERING MATERIALS (PROPERTIES, TYPES AND USES):** Stone: Compressive strength, Water absorption, Durability
3	2	Impact value, Tensile strength; Bricks: Water absorption
4	2	Compressive strength, Effloresces, Dimension and Tolerance
5	2	Tiles: Water absorption, Tolerance, Impact value and Glazing; Light weight concrete blocks
6	2	Lime: classification as per IS, properties, standard tests and uses in construction
7	2	Fly-ash: Properties and Use in manufacturing of bricks & cement
8	2	Miscellaneous: Gypsum, Plaster of Paris

9	2	PVC materials, Paints, Varnish and Distemper
10	**3**	**TIMBER & STEEL:** Timber: Definitions of related terms, Classifications and Properties, Defects in Conversion of wood
11	3	Seasoning wood, Preservation, Fire proofing, Ply woods, Fiber boards
12	3	Steel: Mild steel and HYSD steel, Properties and their use, common tests on steel
13	**4**	**MORTAR AND PLASTER:** Mortar preparation methods:
14	4	Functions and tests & their uses in various types of pointing & plastering
15	**5**	**Brick and stone masonry**: Basic principle of masonry work, different types of bonds
16	5	Relative merits and demerits of English, Single Flemish and Double Flemish bond
17	5	Comparison between stone and brick masonry
18	5	General principles, classification of stone masonry and their relative merits and demerits
19	**6**	**BUILDING REQUIREMENTS & CONSTRUCTION SYSTEM:** Building components, their functions and requirements
20	6	Types of construction: load bearing and framed structure construction
21	6	RCC beam, column and slab construction
22	6	Precast and In-situ construction, Relative merits and demerits. Fire resistance construction, FRC
23	6	**GROUND & UPPER FLOORS:** Floor components and their functions
24	6	Floor types and Selection of flooring
25	6	Construction details of ground and upper floors, merits and demerits
26	**7**	**FOUNDATION & SITE PREPARATION:** Purpose, types of foundation: like shallow, deep
27	7	Pile, raft, grillage foundation and their suitability
28	7	Depth of foundation, Sequence of construction activity and co-ordination, site clearance, layout of foundation plan
29	7	**TEMPORARY STRUCTURES**: Types & methods of shoring
30	7	Underpinning and scaffolding
31	**8**	**DAMP PROOFING:** Causes and Effects of dampness, Methods and materials for damp proofing
32	8	Methods and materials for anti-termite treatment
33	8	**CONSTRUCTION AND EXPANSION JOINTS:** Requirements, Types material used, Construction details

34	**9**	**ARCHES AND LINTELS:** Terms used, types of arches
35	9	Arch construction detail,
36	9	Types of lintels and constructions.
37	**10**	**STAIRS:** Terms used, requirements of good staircase, classification
38	10	Construction details and suitability of different types of stairs, Lifts and Ramps
39	**11**	**ROOF AND ROOF COVERING:** Purposes, classification of roofs, terms used
40	11	Introduction to Solid slab, Flat slab, Shell Roofs and Pitched roofs, and their constructional features
41	11	Types of pitched roofs and Trusses, typical constructional details
42	11	Roof covering materials, types and typical constructional details

TEXT/REFERENCE BOOKS

1. Building Materials By Prabin Singh; S.K.Kataria & Sons.
2. Building Materials: Products, Properties and Systems by Ghambir, Tata Mc Graw Hill,
3. Construction Equipments & Management by R.L. Purifoy, Tata Mc Graw Hill.
4. Construction Technology by Subir K. Sarkar & Subhajit Saraswati, Oxford University Press

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Bhupendra Purohit	Subject Code: 3CE4-08
Subject	: Engineering Geology	
Department	: Civil Engineering	Sem: III
Total No. of Lectures Planned: 28		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Explain different types of rocks & minerals found on earth.

CO2. Explain faults and folds in earth crust.

CO3. Explain the difference between several minerals by examining their physical & chemical properties.

Lecture No.	Unit	Topic
1	1	INTRODUCTION: Objective, scope and outcome of the course.
2	1	**GENERAL GEOLOGY:** internal structure of earth
3	1	Types of weathering, and geological work of river
4	1	Geological work of wind
5	1	Geological time scale
6	1	Physical properties of minerals
7	1	Revision
8	2	**PETROLOGY:** Formation , texture of igneous rocks
9	2	Classification of Igneous rocks
10	2	Formation and texture of sedimentary rocks
11	2	Classification of sedimentary rocks
12	2	Structure wind classification of metamorphic rocks
13	2	Engineering properties of rocks lab and field test for construction site
14	3	**STRUCTURE GEOLOGY:** Terminology, classification of folds
15	3	Causes, recognition effect of folds and engineering consideration of folds
16	3	Terminology and classification of faults and dip and strike problem

17	3	Terminology, classification of joint, cause, engineering consideration
18	3	Cause, terminology, classification engineering consideration of unconformity
19	4	**ENGINEERING GEOLOGY:** Geophysical method as application in civil engineering
20	4	Electric method
21	4	Seismic method
22	4	Terminology and type of dams
23	4	Terminology and types of tunnel
24	4	Geological consideration for site selection for tunnel
25	5	**REMOTE SENSING AND GIS:** introduction of RS and GIS
26	5	Application of RS and GIS in land use
27	5	Application in construction
28	5	Application in Agricultural and irrigation

TEXT/REFERENCE BOOKS

1. Parbin Singh-A Text Book of Engineering & General Geology-S.K.Kataria & Sons.
2. S.K.Garg- Physical & Engineering Geology- Khanna Publishers.
3. Remote Sensing and GIS: B.Bhatta- Oxford Publishers.
4. M.T.Maruthesha Reddy- A Text book of Applied Engineering Geology-New Age International Publisher.

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Syllabus Deployment

Name of Faculty	: Mr. Nishant Sharma	Subject Code: 3CE4-21
Subject	: Surveying Lab	
Department	: Civil Engineering	SEM: III
Total No. of Labs Planned: 13		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: To verify the theorems in fluid mechanics and calibration of the instruments like Venturimeter, Orificmeter

CO2: Determine different coefficients and factors involved in fluid flow

CO3: Build knowledge on the working principles, components, functions of hydraulic

Lab No.	Exp. No.	Topic
1	1	Linear Measurement by Tape: Ranging and Fixing of Survey Station.
2	1	Linear Measurement by Tape: Plotting Building Block by offset with the help of cross staff.
3	2	Compass Survey: Measurement of bearing of lines using Surveyor's and Prismatic compass.
4	2	Compass Survey: Adjustment of included angles of compass traverse.
5	3	Levelling: To determine the reduced levels in closed circuit.
6	3	Levelling: To carry out profile levelling and plot longitudinal and cross sections for road.
7	4	Theodolite Survey: To carryout temporary adjustment of Theodolite & Measurement of horizontal and vertical angle: by method of repetition and method of Reiteration.
8	4	Theodolite Survey: To measure and adjust the angles of a braced quadrilateral.
9	5	Trigonometric Levelling: To determine the Height of an object by using Instruments in same vertical plane.
10	5	Trigonometric Levelling: To determine the Height of an object by using Instruments in different vertical plane.

11	6	Tachometry Survey: To determine the tachometric constant.
12	6	Tachometry Survey: To determine the horizontal and vertical distance by tachometric survey.
13	7	To study the various electronic surveying instruments like EDM, Total Station etc.

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Syllabus Deployment

Name of Faculty	: Mr. Bharat Kr. Suthar	Subject Code: 3CE4-22
Subject	: Fluid Mechanics Lab	
Department	: Civil Engineering	Sem: III
Total No. of Lab Planned: 10		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: To verify the theorems in fluid mechanics and calibration of the instruments like Venturimeter, Orificmeter

CO2: Determine different coefficients and factors involved in fluid flow

CO3: Build knowledge on the working principles, components, functions of hydraulic equipment

Lab No.	Exp. No.	Experiment Name
1	1	To study the various pressure measuring devices
2	2	To verify the Bernoulli's theorem
3	3	To calibrate the Venturi-meter
4	4	To calibrate the Orifice-meter
5	5	To determine the meta-centric height
6	6	To determine Cc, Cv, C_d of an orifice
7	7	To determine C_d of a mouthpiece
8	8	To determine C_d of a V-notch
9	9	To determine viscosity of a given fluid
10	10	To study the velocity distribution in pipes

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LAB Syllabus Deployment

Name of Faculty	: Mr. Jitendra Choubisa	Subject Code: 3CE4-23
Subject	: Computer Aided Civil Engineering Drawing	
Department	: Civil Engineering	Sem: III
Total No. of Lectures Planned: 13		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Able to understand the basic command, principles and features behind AutoCAD.

CO2. Able to draft the plan, elevation and sectional views of buildings

Lecture No.	Unit	Topic
1	1	Drawing of walls a. Brick and Stone masonry
2	1	Cross section of external wall from foundation to parapet
3	1	Partition wall, cavity wall and
4	2	Pointing, Arches, Lintels and Floors
5	3	Doors and Windows
6	3	Doors and Windows
7	4	Stairs, Cross section of Dog legged stairs
8	4	Stairs, Cross section of Dog legged stairs
9	5	Roofs: Flat and Pitched roof (Steel truss)
10	6	Development of Front Elevation and Sectional Elevation from a given plan
11	6	Development of Front Elevation and Sectional Elevation from a given plan
12	7	Development of Plan, Front Elevation and Sectional Elevation from line diagram
13	7	Development of Plan, Front Elevation and Sectional Elevation from line diagram

Techno India NJR Institute of Technology

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LAB Syllabus Deployment

Name of Faculty	: Mr. Rakesh Yadav	Subject Code: 3CE4-24
Subject	: Civil Engineering Material Lab	
Department	: Civil Engineering	Sem: III
Total No. of Labs Planned: 15		

COURSE OUTCOMES HERE (3 OUTCOMES)
At the end of this course students will be able to:
CO1: To study about fly ash, different stones, different glasses, and aluminum and steel sections.

CO2: To determine the various properties of cement

CO3: To identification of building materials by visual inspection

Lab No.	Exp. No.	Name of Experiment
1	1	To determine Compressive strength of stone material.
2	1	To determine Water absorption of stone material.
3	1	To determine Impact value of stone material.
4	1	To determine Tensile strength of stone material.
5	1	To determine Compressive strength of Brick material.
6	1	To determine Water absorption of Brick material.
7	1	To determine Dimension and Tolerance of Brick material.
8	1	To determine Water absorption of Tile material.
9	1	To determine Tolerance of Tile material.
10	1	To determine Impact value of Tile material.
11	1	To determine the Compressive and Tensile Strength of Timber

12	2	To Study the Properties & Utilization of Fly Ash in Construction
13	3	To Study the Different Aluminum and Steel Sections
14	4	To Study the Manufacturing and Use of Concrete Hollow Blocks
15	5	To Study the Properties and Uses of Kota Stone and its Slurry

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Shambhu P. Choubisa	Subject Code: 4CE1-03
Subject	: Managerial Economics & Financial Accounting	
Department	: Civil Engineering	Sem: IV
Total No. of Lectures Planned: 26		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: Explain core economic terms, concepts, and theories.

CO2: Explain the function of market and prices as allocative mechanisms. Apply the concept of equilibrium to both microeconomics and macroeconomics.

CO3: Identify key macroeconomic indicators and measures of economics change, growth, and development.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION** to scope, objective and outcome of subject
2	**2**	**MEANING, NATURE AND SCOPE OF ECONOMICS**, deductive vs inductive
3	2	Static and dynamics, Economic problems: scarcity and choice
4	2	Circular flow of economic activity
5	2	National income-concepts and measurement
6	2	Numerical
7	3	Demand-types of demand, determinants of demand
8	3	Demand function, elasticity of demand
9	3	Demand forecasting –purpose, determinants and methods
10	**3**	**SUPPLY-DETERMINANTS OF SUPPLY**, supply function, elasticity of supply
11	3	Numerical

12	3	Numerical
13	**4**	**THEORY OF PRODUCTION**- production function
14	4	Law of variable proportions, laws of returns to scale, production optimization
15	4	Least cost combination of inputs, isoquants.
16	4	Cost concepts-explicit and implicit cost, fixed and variable cost
17	4	Opportunity cost, sunk costs, cost function
18	4	Cost curves, cost and output decisions, cost estimation
19	4	Numerical
20	**5**	**MARKET STRUCTURE AND PRICING THEORY** ,Perfect competition,
21	5	Monopolistic competition, Oligopoly
22	5	Equilibrium price, equilibrium quantity
23	5	Numerical
24	**6**	**BALANCE SHEET AND RELATED CONCEPTS**, profit and loss statement and
25	**6**	Financial ratio analysis, cash-flow analysis, funds flow analysis,
26	**6**	Comparative financial statement, analysis and interpretation of financial capital

TEXT/REFERENCE BOOKS

1. Managerial Economics & Financial Accounting by Dr. Anoop kumar Atria, Dr. Habhan Singh
2. Managerial Economics by William F. Samuleson, Stephen G. Marks.

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Syllabus Deployment

Name of Faculty	: Mrs. Payal Jain	Subject Code: 4CE2-01
Subject	: Advance Engineering Mathematics-II	
Department	: Civil Engineering	Sem: IV
Total No. of Lectures Planned: 26		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Apply a range of mathematical theorems and methods to solve routine and complex analytic and applied problems;

CO2. Analyse data necessary for the solution of engineering problems

CO3. Examine the effectiveness of proposed solutions to identified engineering problems.

Lecture No.	Unit	Topic
1	1	**INTRODUCTION:** Objective, scope and outcome of the course
2	2	**PROBABILITY:** Basic concepts of probability
3	2	conditional probability, Baye's theorem
4	2	Random variable: Discrete and Continuous random variables
5	2	Joint distribution, Marginal distribution
6	2	Probability distribution function, Conditional distribution
7	2	Probability distribution function, Conditional distribution
8	2	Mathematical Expectations: Moments, Moment Generating Functions
9	2	Mathematical Expectations
10	2	variance and correlation coefficients
11	2	variance and correlation coefficients
12	2	Chebyshev's Inequality, Skewness and Kurtosis

13	2	Binomial, Poisson and Normal distribution and their properties
14	3	**APPLIED STATISTICS:** Basic concept of variance
15	3	Correlation and regression – Rank correlation
16	3	Curve fitting by the method of least squares- fitting of straight lines
17	3	Second degree parabolas and more general curves
18	3	Test of significance: Large sample test for single proportion
19	3	Test of significance: Large sample test for single proportion
20	3	Difference of proportions
21	3	Single mean, difference of means
22	3	Single mean, difference of means
23	3	Single mean, difference of means
24	3	Difference of standard deviations
25	3	Difference of standard deviations
26	3	Revision of Course Work

TEXT/REFERENCE BOOKS

1. R.K.Jain and S.R.K.Iyengar, Advanced Engineering Mathematics, Narosa Pub. House, 2008.
2. Erwyn Kreyszig, Advanced Engineering Mathematics, John Wiley and Sons, 8th Edition, 2008.
3. B.S.Grewal, Higher Engineering Mathematics, Khanna Publications, 2009.

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Syllabus Deployment

Name of Faculty	: Mr. Yogendra Solanki	Subject Code: 4CE3-04
Subject	: Basic Electronics for Civil Engineering Applications	
Department	: Civil Engineering	Sem: IV
Total No. of Lectures Planned: 28		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Characterize semiconductors, diodes, transistors and operational amplifiers.

CO2. Understand functions of digital multimeter, cathode ray oscilloscope and transducers in the measurement of physical variables.

CO3. Design simple combinational and sequential logic circuits.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** to objective, scope and outcome of the subject
2	**2**	**BASIC ELECTRONICS**: Number systems & Their conversion used in digital Electronics, Demorgan's theorem, Logic Gates
3	1	Half and full adder, R-S flip flop, J-K flip flop
4	**3**	**INTRODUCTION TO SEMICONDUCTORS**, Diodes, V-I characteristics
5	2	Bipolar junction transistors (BJT) and their working, introduction to CC
6	2	CB & CE transistor configurations
7	**4**	**INSTRUMENTATION**: mechanical, electrical, electronic system and their calibration
8	3	Use of automatic and digital levels, electronic theodolites
9	3	Total stations; Control surveys using GNSS
10	3	Total station and traversing methods (adjustment and computations of coordinates)
11	**5**	**MEASUREMENT ERRORS:** Gross error and systematic errors
12	5	Absolute and relative errors, accuracy, precision, resolution and significant figures

13	**6**	**DATA ACQUISITION SYSTEM** and data processing: analog systems
14	6	Digital systems using personal computers, dynamic measurement
15	6	Numerical and graphical data processing and archiving
16	7	**SENSORS & TRANSDUCERS:** various types of sensors for displacement
17	7	velocity, acceleration, pressure, loads, strains, Displacement sensors
18	7	Mass & Piezoelectric, strain gauges, Temperature sensors thermocouple
19	7	flow sensors: Ultrasonic, electromagnetic, laser and thermal
20	**8**	**SENSOR TYPES CHARACTERISTICS:** types of resolution, FOV, IFOV, PSF
21	8	Geometric and radiometric distortions, Geo-referencing, re-sampling
22	8	methods; Atmospheric errors and removal
23	8	Satellite orbits and characteristics; remote sensing
24	**8**	Applications of optical and microwave techniques in Civil Engineering
25	**9**	DIGITAL IMAGE PROCESSING: Digital Image
26	**9**	Introduction to Digital Image Processing, Pre-Processing, Enhancement, Classification,
27	**9**	Accuracy Assessment
28	**9**	Digital Image Processing: Digital Image, Introduction to Digital Image

TEXT/REFERENCE BOOKS

1. Neil Storey, "Electronics A Systems Approach", 4/e - Pearson Education Publishing Company Pvt Ltd, 2011.
2. Bhargava N. N., D C Kulshreshtha and S C Gupta, "Basic Electronics & Linear Circuits", Tata McGraw Hill, 2/e, 2013.

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Syllabus Deployment

Name of Faculty	: Dr. Sangeeta Choudhary	Subject Code: 4CE4-05
Subject	: Strength of materials	
Department	: Civil Engineering	Sem: IV
Total No. of Lectures Planned: 42		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: Analyze and design structural members subjected to tension, compression, torsion, bending and combined stresses using the fundamental concepts of stress, strain and elastic behaviour of materials

CO2: Utilize appropriate materials in design considering engineering properties, sustainability, cost and weight.

CO3: Perform engineering work in accordance with ethical and economic constraints related to the design of structures.

Lecture No.	Unit	Topic
1	1	**INTRODUCTION:** To Objective, Scope And Outcome Of The Subject
2	2	**SIMPLE STRESSES AND STRAINS IN DIFFERENT MEMBERS**: Stresses In Prismatic & Non Prismatic Members
3	2	(Contd.) Simple Stresses And Strains In Different Members
4	2	Simple Stresses And Strains In Different Members In Composite Members.
5	2	Thermal Stresses
6	2	Stresses In Composite Members, Compatibility Condition
7	2	Stresses In Composite Members, Compatibility Condition
8	3	**COMPOUND STRESS:** Two Dimensional Stress System

9	3	Stress Resultant, Principal Planes And Principal Stresses
10	3	Stress Resultant, Principal Planes And Principal Stresses
11	3	State Of Pure Shear Maximum Shear Stress
12	3	Mohr's Circle &Its Application
13	3	Introduction To Theories Of Failures
14	**4**	**BENDING OF BEAMS:** Bending Moment
15	4	Shear Force And Axial Thrust Diagrams For Statically Determinate
16	4	Shear Force And Axial Thrust Diagrams For Statically Determinate
17	4	Point Of Contra-Flexure, Relation Between Load
18	4	SF And BM Numerical
19	4	(Contd.) SF And BM Numerical
20	4	(Contd.) SF And BM Numerical
21	4	(Contd.) SF And BM Numerical
22	4	(Contd.) SF And BM Numerical
23	5	THEORY OF SIMPLE BENDING
24	5	Distribution Of Bending And Shear Stresses
25	5	(Contd.) Distribution Of Bending And Shear Stresses
26	5	Distribution Of Bending And Shear Stresses
27	5	Distribution Of Bending And Shear Stresses
28	5	Combined Direct And Bending Stress
29	5	Combined Direct And Bending Stress
30	6	TORSION: Elementary Concepts Of Torsion
31	6	Shear Stress In Solid And Hollow Circular Shafts
32	6	Angle Of Twist, Power Transmitted By A Shaft
33	6	Bending And Torsion
34	7	COLUMNS: Short And Long Columns
35	7	Slenderness Ratio, Crushing And Buckling Of Column
36	7	Short Column Subjected To Axial And Eccentric Loads
37	7	Euler's Theory And Its Limitation, Concept Of Effective Length Of
38	7	Rankine & Secant Formulae, Middle Third Rule, Core Of A
39	8	DEFLECTION OF BEAMS: Differential Relation Between Load
40	8	Shear Force, Bending Moment, Slope Deflection.

41	8	Slope & Deflection In Determinate
42	8	Double Integration Method

TEXT/REFERENCE BOOKS

1. Mechanics of Structures Vol. I & II by S.B Junarkar, Charotar Publishing House, Anand.
2. Strength of Materials & Mechanics of Structures: Vol. I, II by Dr. B.C. Punmia Laxmi Publications (p) Ltd.
3. Strength of Material by Singer and Pytel, Harper Collins Publishers.
4. Elements of Strength of Materials by Timoshenko & Young, Mc Graw Hill Book Co.

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Syllabus Deployment

Name of Faculty	: Mr. Nishant Sharma	Subject Code: 4CE4-06
Subject	: Hydraulics Engineering	
Department	: Civil Engineering	Sem: IV
Total No. of Lectures Planned: 42		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Explain the flow of fluids in channels.

CO2. Explain different types of turbines & pumps used.

CO3. Explain the analytical process of deriving equation by using dimensional methods.

Lecture No.	Unit	Topic
1	1	**INTRODUCTION:** Objective, scope and outcome of the course.
2	2	**DIMENSIONAL ANALYSIS & MODELS:** Dynamical similarity and dimensional homogeneity model experiment. Geometric, kinematic and dynamic similarity.
3	2	Reynold's, Froude's, Weber's, Euler and Mach numbers. Distorted river models and undistorted models, proper choice of scale ratios.
4	2	Scale effect. Principle of dimensional analysis Rayleigh method.
5	2	Buckingham theorem
6	3	**TURBULENT FLOW:** Reynolds equations, Prandtl's mixing length theory
7	3	Equations of velocity distribution and friction coefficient.
8	3	**Boundary Layer Theory**: Concept of boundary layer, laminar and Turbulent boundary layers.

9	3	Boundary layer thickness, Von Karman integral equation, laminar sub-layer.
10	3	Hydro-dynamically smooth and rough boundaries
11	3	Separation of flow and its control, cavitation.
12	**4**	**OPEN CHANNEL FLOW:** Uniform, Non-Uniform and variable flow, Resistance equations of Chezy and Manning.
13	4	Section factor for uniform flow. Most Efficient rectangular section
14	4	Most Efficient trapezoidal section and its numerical.
15	4	Most Efficient triangular section and its numerical.
16	4	Velocity distribution in open channels.
17	**5**	**GRADUALLY VARIED FLOW:** Specific energy of flow. Critical depth in prismatic channels. Alternate depths.
18	5	Numerical based on specific energy of flow
19	5	Rapid, critical and sub critical Flow Mild, steep and Critical Slopes.
20	5	Classification of surface curves in prismatic channels and elementary computation
21	**6**	**RAPIDLY VARIED FLOW**: Hydraulic jump or standing wave in rectangular channels.
22	6	Conjugate or sequent depths, Losses in jump, location of jump.
23	6	Numerical based on above topics. Velocity distribution in open channels.
24	6	Energy correction factor. Moment correction factor
25	7	**IMPACT OF FREE JETS:** Impact of a jet on a flat or a curved vane, Moving and stationary vane.
26	7	Introduction of Hydraulic machine: Type of pumps and its brief description.
27	7	Type of turbine and its brief description. Draft tube and its principle
28	**8**	**HYDROLOGY:** Definition, Hydrologic cycle, Application to Engineering problems
29	8	Measurement of rainfall, rain gauge.
30	8	Peak flow, flood frequency method.
31	8	Catchment area formulae, Flood hydrograph.
32	8	Rainfall analysis, Infiltration, Run off.
33	8	Numerical based on above topics.
34	8	Unit hydrograph and its determination
35	8	Estimation of run off.
36	**9**	**GROUND WATER**: Aquifers and its types, Confined and unconfined aquifer
37	9	Darcy's Law, hydraulic conductivity

38	9	Transmissivity, well hydraulics and numerical.
39	**10**	**CANAL HYDRAULICS:** Types of canals, parts of canal irrigation system; Channel alignment.
40	10	Assessment of water requirements. Estimation of channel losses and Numerical.
41	10	Design of channels, regime and semi theoretical approaches (Kennedy's Theory)
42	10	Design of channels, regime and semi theoretical approaches (Lacey's Theory), Cross section of channels, silt control in canals.

TEXT/REFERENCE BOOKS

1. Fluid Mechanics & Hydraulics by Dr. K.R, Arora, Standard Publishers & Distributers, Delhi.
2. Fluid Mechanics & Hydraulics by Dr. R.K. Bansal, Laxmi Publications (P) Ltd.
3. Fluid Mechanics & Hydraulics by Modi & Seth, Standard Publishers & Distributers, Delhi.
4. Fluid Mechanics & Machinery by C.S.P.Ojha, R.Berndtsson and P.N.Chandramauli, Oxford Publishers, Delhi.

पंकज पोखरिया

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Syllabus Deployment

Name of Faculty	: Mr. Lokesh P Goswami	Subject Code: 4CE4-07
Subject	: Building Planning	
Department	: Civil Engineering	Sem: IV
Total No. of Lectures Planned: 28		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: Build an Articulated Plan. The obvious place to start during the planning process is building a plan.

CO2: Focus on Strategic Differentiation. Build a plan that's focused on your strategic differentiation.

CO3: Align Your Organization.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION TO SCOPE, OBJECTIVE AND OUTCOME OF SUBJECT**
2	**2**	**INTRODUCTION:** Types of buildings, criteria for location and site selection
3	2	Site plan and its detail
4	**3**	**SUN CONSIDERATION** : Different methods of drawing sun chart
5	3	Sun shading devices
6	3	Design of louvers
7	**4**	**CLIMATIC AND COMFORT CONSIDERATION**: Elements of climate
8	4	Global climate, climatic zones of India, thermal comfort
9	4	Bioclimatic chart

10	**5**	**ORIENTATION:** Meaning, factors affecting orientation, orientation criteria For tropical climate
11	**6**	**BUILDING BYE LAWS AND NBC REGULATIONS**: Objective of by-laws, regulation regarding; means of access, lines of building frontages
12	6	Covered area, floor area ratio, open spaces around buildings
13		Height & sizes of rooms, plinth regulation
14	**7**	**PRINCIPLES OF PLANNING:** Different factors affecting planning viz-aspect
15		Prospect, furniture requirement, roominess, grouping
16		Circulation, elegance, privacy etc
17	**8**	**VASTU SHASTRA** In Modern Building planning: Factors considered in Vastu, site
18		Orientation, planning and design of residential, buildings, school/hospital
19		Orientation, planning
20	**9**	**FUNCTIONAL DESIGN AND ACCOMMODATION REQUIREMENTS** Of
21		Rest house, primary health centers, post office etc
22		Rest house, primary health center's
23	**10**	**SERVICES IN BUILDINGS** (A) Lighting and ventilation, doors and windows, lifts
24		(A) Lighting and ventilation, doors and windows, lifts
25		(A) Lighting and ventilation, doors and windows, lifts
26		(B) Acoustics, sound insulation and noise control
27		(B) Acoustics, sound insulation and noise control
28		(C) Firefighting provisions

TEXT/REFERENCE BOOKS

1. Building Drawing by M.G.Shah, C.M. Kala, S.Y.Patki , Tata Mc Graw Hills.
2. Manual of Tropical Housing and Buildings by Koenigs Berger Orient and Longman.
3. SP.41 (S&T)- Handbook on functional Requirements of Buildings Part-I
4. National Building Code, BIS.

पंकज पोरवाल

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Syllabus Deployment

Name of Faculty	: Mr. Nishant Sharma	Subject Code: 4CE4-08
Subject	: Concrete Technology	
Department	: Civil Engineering	Sem: IV
Total No. of Lectures Planned: 42		

COURSE OUTCOMES HERE (4 OUTCOMES)

At the end of this course students will be able to:

CO1: Understand chemistry, properties, and classification of cement, fly ash, aggregates and admixtures, and hydration of cement in concrete.

CO2: Prepare and test the fresh concrete.

CO3: Test hardened concrete with destructive and non-destructive testing instruments.

CO4: Design concrete mix of desired grade.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course.
2	**2**	**INGREDIENTS OF CONCRETE:** Cement: hydration of cement and its Basic compounds
3	2	Structure of hydrated cement, C-S-H gel
4	2	Heat of hydration, gel-space ratio etc
5	**3**	**AGGREGATES:** Types, physical properties
6	3	Standard methods for their determination, including Grading of Aggregates as per IS
7	3	Manufactured sand- properties and IS Specifications for use in Concrete.
8	**4**	**CONCRETE:** Grade of concrete, proportioning of ingredients, water Content and its quality

9	4	Water/cement ratio and its role, Properties of fresh concrete Including workability
10	4	Air content, Flow ability, Segregation, Bleeding and Viscosity etc
11	4	Factors affecting, methods of determination
12	**5**	**PROPERTIES OF HARDENED CONCRETE:** Strengths and permeability
13	5	Creep, shrinkage, factors influencing
14	5	Standard tests on fresh and hardened concrete as per IS code
15	5	Aggregate- cement interface, its effect on properties of concrete
16	**6**	**NDT:** Introduction and their importance. Application & use of Rebound Hammer
17	6	Ultra-sonic pulse velocity meter, Rebar & Cover meter
18	6	Half-cell potential meter, corrosion resistivity meter
19	6	Core sampling. Interpretation of their results
20	7	CONCRETE HANDLING IN FIELD: Batching, mixing
21	7	Placing and transportation of concrete
22	7	Equipment's for material handling, various methods their suitability And precautions
23	7	Compaction of concrete: methods & equipment's
24	7	Curing of concrete: various methods their suitability
25	8	DURABILITY OF CONCRETE: Causes of deterioration
26	8	Carbonation.
27	8	Tests for durability assessment.
28	9	ADMIXTURE IN CONCRETE: Chemical and mineral admixtures, their Types and uses
29	9	Accelerator, retarders
30	9	Water-proofing, plasticizers
31	9	Super plasticizers-types, their suitability
32	9	Fly ash-properties for use in concrete
33	9	Specifications of fly ash as per IS 3812, and effect on properties of Concrete
34	9	GGBFS: properties, specifications and utility in concrete
35	9	Micro silica: properties, specifications and utility in concrete
36	9	Metakaolin: properties, specifications and utility in concrete
37	10	CONCRETE MIX DEIGN (IS METHOD): with water reducing admixtures
38	10	Concrete mix deign (IS method): without water reducing Admixtures
39	10	Form work: Requirements, their types
40	10	Typical formworks and shuttering/centering for Columns, beams
41	11	TYPICAL FORMWORKS AND SHUTTERING/centering for slabs, walls, etc
42	11	Slip and moving formwork

TEXT/REFERENCE BOOKS

1. Concrete Technology by M. S. Shetty, S. Chand & Co.
2. Concrete Technology by Neville & Brooks, Pearson Education.
3. Concrete: Microstructure, Properties & Materials by Mehta P. K, Tata Mc Graw Hill.

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Bhupendra Purohit	Subject Code: 4CE4-21
Subject	: Material Testing Lab	
Department	: Civil Engineering	Sem: IV
Total No. of Labs Planned: 9		

COURSE OUTCOMES HERE (3 OUTCOMES)
At the end of this course students will be able to:
CO1: To find out the compressive strength of mild steel, bricks, cement cubes, wooden blocks, cast iron through compressive testing machine.
CO2: To perform and understand the fatigue test, spring test, torsion test.
CO3: Able to understand the different aspects of building material through experiments.

Lab No.	Exp. No.	Topic
1	0	Introduction: Objective, scope and outcome of the practical's
2	1	Test on mild steel HYSD bar
3	2	Test on cement and concrete blocks
4	3	Rockwell and brinell hardness test.
5	4	Izod and charpy impact test.
6	5	Modules of rupture of wood beam test.
7	6	Fatigue test
8	7	Spring test.
9	8	Torsion test.

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Syllabus Deployment

Name of Faculty	: Mr. Bharat Kr. Suthar	Subject Code: 4CE4-22
Subject	: Hydraulics Engineering Lab	
Department	: Civil Engineering	Sem: IV
Total No. of Labs Planned: 8		

COURSE OUTCOMES HERE (3 OUTCOMES)
At the end of this course students will be able to:
CO1: Able to determine the minor losses, friction factor, coefficient of Broad crested weir
CO2: To plot characteristics curve of hydraulics curve of hydraulic jump, Pelton wheel, centrifugal pump
CO3: To understand the different aspects of hydraulics through experiments

Lab No.	Exp. No.	Experiment Name
1	1	To determine the minor losses.
2	2	To determine the friction factor.
3	3	To determine Cd of Broad crested weir
4	4	To verify the momentum equation.
5	5	To determine the discharge of Venturimeter
6	6	To determine Manning's & Chezy's coefficient of roughness for the bed of a given Channel.
7	7	To study and plot characteristics curve of hydraulic jump.
8	8	To study velocity distribution in open channel flow.

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Syllabus Deployment

Name of Faculty	: Mr. Rakesh Yadav	Subject Code: 4CE4-23
Subject	: Building Drawing Lab	
Department	: Civil Engineering	Sem: IV
Total No. of Labs Planned: 12		

COURSE OUTCOMES HERE (3 OUTCOMES)
At the end of this course students will be able to:
CO1: To Planning and drawing of residential building with details of site plan, foundation plan, furniture plan, water supply and sanitary plan
CO2: To planning and drawing of institutional building with details of site plan, foundation plan, furniture plan
CO3: Students will learn the planning and drawing of School, primary health center

Lab No.	Exp. No.	Experiment Name
1	1	To plan and draw working drawings of a Residential building with following detail. Site Plan, Architecture building Plan
2	1	To plan and draw working drawings of a Residential building with following detail. Sectional Elevations, Foundation plans
3	1	Furniture plans, Structural Plans
4	1	Water supply and sanitary plan, Electric Fitting Plans and introduction to MEP
5	1	Water supply and sanitary plan, Electric Fitting Plans and introduction to MEP
6	2	To design and draw a Primary Health Center
7	3	To design and draw a Primary School
8	4	To design and draw a Rest House
9	5	To design and draw a Post Office

10	6	To design and draw a Bank
11	7	To design and draw a College Library
12	8	To design and draw a Cinema Theatre

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Syllabus Deployment

Name of Faculty	: Mr. Nishant Sharma	Subject Code: 4CE4-24
Subject	: Advanced Surveying Lab	
Department	: Civil Engineering	Sem: IV
Total No. of Labs Planned: 7		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: Understand the working principles of theodolite, plane table, auto level, total station.

CO2: Able to measure angles, distances and levels through surveying instruments.

CO3: Interpret survey data and compute areas and volumes.

Lab No.	Exp. No.	Topic
1	1	To measure the horizontal and vertical angles by Theodolite
2	2	To determine the Height of an object by trigonometric levelling (Instruments in same vertical plane)
3	3	To determine the Height of an object by trigonometric levelling (Instruments in different vertical planes)
4	4	Measurement of angles, length of survey line using Total Station, finding the coordinate of station
5	5	To measure and adjust the angles of a braced quadrilateral
6	6	To prepare the map of given area by plane tabling
7	7	Measurement of area of a traverse by Total Station

Techno India NJR Institute of Technology

Academic Administration of Techno NJR Institute

Syllabus Deployment

Name of Faculty	: Mr. Lokesh Puri Goswami	Subject Code: 4CE4-25
Subject	: Concrete Lab	
Department	: Civil Engineering	Sem: IV
Total No. of Labs Planned: 15		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: To determine the different properties of building materials like cement, concrete, aggregates.

CO2: To design concrete mix (M-20 and M-40) in lab

CO3: Study about Non Destructive testing

Lab No.	Experiment No.	Topic
1		Introduction: Objective, scope and outcome of the lab
2	1	To determine the fineness of Cement by Blaine's air permeability test
3	2	To determine the flexural strength of Concrete
4	3	To determine Soundness of cement by Le-chatelier apparatus
5	4	To determine the specific gravity of fine aggregate (sand) by Pycnometer
6	5	To determine the bulking of fine aggregate and to draw curve between water content and bulking
7	6	Sieve analysis of coarse aggregates and fine aggregates
8	7	To determine the workability of given concrete mix by slump test
9	8	To determine the optimum dose of super plasticizers by Flow table test
10	9	To design concrete mix of M-20 grade in accordance with I S 10262
11	10	To design concrete mix of M-40 grade with super plasticizer in accordance with I S 10262
12	11	To determine the Permeability of Concrete
13	12-A	Study of Core cutter, UPV & Rebound Hammer equipment
14	12-B	Study of UPV
15	12-C	Study of Rebound Hammer equipment

Techno India NJR Institute of Technology
Academic Administration of Techno NJR Institute
Syllabus Deployment

Name of Faculty	: Mr. Bharat Kr. Suthar	Subject Code: 5CE3-01
Subject	: Construction Technology & Equipment	
Department	: Civil Engineering	Sem: V
Total No. of Lectures Planned: 28		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Understand the construction practices and techniques.

CO2. Gain the knowledge about Construction Equipment and Management.

CO3. Identify the factors to be considered in planning and construction of buildings.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**INTRODUCTION ON ENGINEERING ECONOMY**
3	2	Principle of Engineering Economy
4	2	Minimum cost point analysis
5	2	Breakeven point analysis
6	2	Depreciation
7	2	Depletion. / Depreciation & Depletion
8	**3**	**SAFETY IN CONSTRUCTION:** Causes, classification
9	3	Cost and measurement of an accident, safety programme for construction
10	3	Safety in construction**: Protective** equipment, accident report,
11	3	Safety measure: (a) For storage and handling of building materials

12	3	Safety measure: (b) Construction of elements of a building
13	3	Safety measure: (c) In demolition of buildings
14	3	Safety lacuna in Indian scenario
15	3	Fire safety provisions as per NBC
16	**4**	**CONSTRUCTION PLANNING:** Need of construction planning
17	4	Constructional Resources, Construction team
18	4	Stages in construction
19	4	Preparation of construction schedule
20	4	Job layout, inspection and quality control
21	4	Materials Management: Objective of Material Management
22	**4**	Materials Management: Functions of Material Management
23	5	Introduction on Construction Equipment and Management
24	5	Earth Moving Equipment-Bull dozers
25	5	Tractor pulled scrapers Power shovels Draglines clamshells; cranes; Hoes
26	**5**	**TRENCHING MACHINE TYPES HAULING EQUIPMENT**; Drilling
27	5	Blasting and Tunnelling Equipment
28	5	Pile Driving Equipment

TEXT/REFERENCE BOOKS

1. Construction Planning, Equipment and Methods by Robert Peurifoy and Clifford J Schexnayder.
2. Construction Technology and Management by Gaurav K Sagar & Arvind K Sagar.
3. Modern Construction Equipment and Methods by Frank Harris.

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Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Nishant Sharma	Subject Code: 5CE4-02
Subject	: Structural Analysis - I	
Department	: Civil Engineering	Sem: V
Total No. of Lectures Planned: 28		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Understand the behaviour of structures under different loading conditions

CO2. Develop the principles and equations for the analysis of statically determinate and indeterminate analysis in preparation for subsequent design courses

CO3. Identify indeterminacy of various structures.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION**: Objective, scope and outcome of the course
2	**2**	**INTRODUCTION TO INDETERMINATE STRUCTURES**, Degrees of freedom per node
3	2	Static and Kinematic indeterminacy (i.e. for beams & frames)
4	2	Static and Kinematic indeterminacy (i.e. portal with & without sway etc), Releases in structures
5	2	Maxwell's reciprocal theorem
6	2	Bette's theorem
7	2	Analysis of prop cantilever structures
8	2	Analysis of Indeterminate Structure (fixed beams) using Area moment method
9	2	Analysis of Indeterminate Structure (continues beams) using Area moment method

10	2	Conjugate beam method
11	2	(Contd.) Conjugate beam method
12	2	Three moments Theorem
13	**3**	**ANALYSIS OF STATICALLY INDETERMINATE STRUCTURES** using Slope-deflection method applied to continuous beams
14	3	(Contd.) Slope-deflection method applied to continuous beams
15	3	Slope-deflection method applied to portal frames with inclined members
16	3	(Contd.) Slope-deflection method applied to portal frames with inclined members
17	3	Slope-deflection method applied to portal frames without inclined members
18	3	(Contd.) Slope-deflection method applied to portal frames without inclined members
19	3	Moment-distribution method applied to continuous beams
20	3	(Contd.) Moment-distribution method applied to continuous beams
21	3	Moment-distribution method applied to portal frames with inclined members
22	3	(Contd.) Moment-distribution method applied to portal frames with inclined members
23	3	Moment-distribution method applied to portal frames without inclined members
24	**4**	**VIBRATIONS:** Elementary concepts of structural vibration, Mathematical models, basic elements of vibratory system
25	4	Degree of freedom. Equivalent Spring stiffness of springs in parallel and in series
26	4	Simple Harmonic Motion: vector representation, characteristic, Addition of harmonic motions, Angular oscillation
27	4	Undamped free vibration of SDOF system: Newton's law of motion, D Almbert's principle, deriving equation of motions, solution of differential equation of motion,
28	4	Frequency & period of vibration, amplitude of motion; Introduction to damped and forced vibration

TEXT/REFERENCE BOOKS

1. Strength of Materials & Mechanics of Structures: Vol. I by Dr. B.C. Punmia Laxmi Publications (p) Ltd.
2. Theory of Structure by Jangid & Negi, Tata Mc Graw Hill.
3. Structural Analysis by Hibbler R.C., Pearsons.

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Rakesh Yadav	Subject Code: 5CE4-03
Subject	: Design of Concrete Structures	
Department	: Civil Engineering	Sem: V
Total No. of Lectures Planned: 40		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: To design various components of the structures.

CO2: Study the development length and shear reinforcement.

CO3: To design the axially loaded column, isolated column footing.

Lecture No	Unit	Topic
1	1	**INTRODUCTION:** Objective, scope and outcome of the course
2	2	**FUNDAMENTAL CONCEPTS OF DESIGN OF RC MEMBERS**, assumptions
3	2	Types and function of reinforcement. Introduction to various related IS codes,
4	2	Characteristic load and characteristic strength
5	2	Working Stress Method: Working stress design philosophy
6	2	Design of singly reinforced rectangular beam section for flexure
7	3	**LIMIT STATE DESIGN: LIMIT STATE** design philosophy, Assumptions
8	3	Analysis and design of singly reinforced
9	3	Analysis and design of singly reinforced

10	3	Analysis and design of singly reinforced
11	3	Doubly reinforced rectangular beams and flanged beams for flexure using codal provisions for simply supported
12	3	Analysis and design of doubly reinforced rectangular beams and flanged beams for flexure using codal provisions for simply supported.
13	3	Analysis and design of doubly reinforced rectangular beams and flanged beams for flexure using codal provisions for simply supported
14	3	Analysis and design of cantilever, fixed and continuous beams
15	3	Analysis and design of cantilever, fixed and continuous beams
16	3	Analysis and design of cantilever, fixed and continuous beams
17	4	**LIMIT STATE OF SERVICEABILITY FOR DEFLECTION**: control of deflection as per codal provisions of empirical coefficients
18	4	Limit state of serviceability for deflection: control of deflection as per codal provisions of empirical coefficients
19	4	Limit state of collapse in shear: Types of shear reinforcement and its detailing
20	4	Analysis and design of shear reinforcement for prismatic sections
21	4	Limit state of collapse in bond: concept of bond stress, anchorage and development length
22	4	Detailing and curtailment of reinforcement as per codal provisions
23	5	**SLABS: ANALYSIS AND DESIGN OF ONE WAY USING LSM**
24	5	Analysis and design of one way using LSM
25	5	Analysis and design two way slabs using LSM
26	5	Analysis and design two way slabs using LSM
27	5	Detailing of reinforcement
28	5	Check for shear and deflection
29	6	**COLUMNS:** Short and long columns, their structural behavior
30	6	Analysis and design of axially loaded short columns, using LSM
31	6	Analysis and design of axially loaded short columns, using LSM

32	6	Analysis of eccentrically loaded short columns
33	6	Introduction to Pu-Mu interaction curves and their use for eccentrically loaded columns
34	6	Footings: Analysis and design of Isolated column footing for axial load
35	6	Analysis and design of Isolated column footing for axial load
36	6	Introduction to combined footing for two columns (without central beam) for axial loads using LSM
37	6	Introduction to combined footing for two columns (without central beam) for axial loads using LSM
38	7	**TORSION:** Analysis and Design of beams for torsion as per codal method
39	7	Analysis and Design of beams for torsion as per codal method
40	7	Analysis and Design of beams for torsion as per codal method

TEXT/REFERENCE BOOKS

1. Reinforced Concrete: Limit State Design by A.K.Jain; Nem Cahnd and Brothers, Roorkee.
2. Limit State Design by Dayaratnam; Oxford and IBH Publishing House.
3. Limit State Design of Reinforced Concrete by Verghese P.C.; PHI Delhi.

Techno India NJR Institute of Technology
Academic Administration of Techno NJR Institute
Syllabus Deployment

Name of Faculty	: Mr. Jitendra Choubisa	Subject Code: 5CE4-04
Subject	: Geotechnical Engineering	
Department	: Civil Engineering	Sem: V
Total No. of Lectures Planned: 42		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Explain different types of soil present on earth crust.

CO2. Explain different types of soil properties and their use in engineering fields.

CO3. Analyze engineering properties of soil like compaction, permeability, and shear strength.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**SOIL AND SOIL-MASS CONSTITUENTS**, water content
3	2	Specific gravity, void ratio, porosity, degree of saturation
4	2	Air void and air content, unit weights, density index
5	2	Inter-relationships
6	2	Determination of index properties of soil: water content, specific gravity
7	2	Particle size distribution, sieve and sedimentation analysis, consistency limits, void ratio and density index
8	2	Mineral structures, structures of Illite Montmorillonites and kaolinite and their characteristics
9	2	Darcy's law of permeability of soil and its determination in laboratory

10	2	Stresses in soil mass: total, effective and neutral pressure, calculation of stresses, influence of water table on effective stress
11	2	Quicksand phenomenon. Classification of soil for general engineering purposes
12	**3**	**MOHR'S CIRCLE OF STRESS**, shearing strength of soil, parameters of shear Strength, Coulomb's failure envelope
13	3	Determination of shear parameters by Direct Shear Box
14	3	Tri-axial and unconfined compression test apparatuses
15	3	Principles of soil compaction, laboratory compaction tests; Proctor's test
16	3	Stresses in Soil under surface loading: Bossinesq's and Westergaard's analysis for vertical pressure and its distribution in a soil mass
17	3	Vertical stresses due to concentrated loads, Isobar diagram
18	3	Vertical stress distribution on a horizontal plane. Influence diagram
19	3	Vertical stresses at a point under circular and rectangular loaded area
20	3	Approximate methods of obtaining vertical pressure due to surface loading. Newmark's chart
21	**4**	**COMPRESSIBILITY AND CONSOLIDATION:** Introduction to consolidation, comparison of compaction and consolidation,
22	4	Spring Analogy Terzaghis one dimensional consolidation theory
23	4	Degree of consolidation, consolidation test, Compressibility parameters
24	4	Degree of consolidation, consolidation test, Compressibility parameters
25	4	Coefficient of consolidation. Pre-consolidation pressure and its determination
26	4	Normally, over and under consolidated soils
27	4	Methods of predicting Settlement and its rate
28	4	Total and differential Settlement
29	**5**	**STABILITY OF SLOPES:** Classifications of slopes
30	5	Stability analysis of infinite slopes. Stability of finite slopes by Swedish and Friction circle method
31	5	Stability analysis of infinite slopes. Stability of finite slopes by Swedish and Friction circle method
32	5	Stability analysis by Taylor's stability number , Taylor's stability number curves
33	5	Stability analysis by Taylor's stability number , Taylor's stability number curves
34	5	Bishop's method of stability analysis
35	5	Earth Pressure: Active, passive and earth pressure at rest

36	5	Rankine's and Coulomb's theories
37	5	Rebhann's and Culman's graphical methods For active earth pressure for vertical and inclined back retaining Walls, horizontal and inclined cohesion less back fill
38	5	Rebhann's and Culman's graphical methods For active earth pressure for vertical and inclined back retaining Walls, horizontal and inclined cohesion less back fill
39	**6**	**BEARING CAPACITY OF SOILS:** Terminology related to bearing capacity, Common types of foundations
40	6	Terzaghi and Meyehoff's theory for bearing capacity. Rankine's method for minimum depth of foundation. Skempton's method
41	6	Effect of eccentricity and water table on bearing capacity
42	6	IS code method, Plate load and penetration tests for determining bearing capacity

TEXT/REFERENCE BOOKS

1. Basic and applied Civil Mechanics by Ranjan & Rao, New Age International Publishers.
2. Soil Mechanics & Foundation Engineering by Arora K.R, Standard Publishers and Distributers, Delhi.
3. Soil Engineering in Theory & Practice by Alam Singh, CBS Publishers and Distributers, Delhi.

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Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Jitendra Choubisa	Subject Code: 5CE4-05
Subject	: Water Resources Engineering	
Department	: Civil Engineering	Sem: V
Total No. of Lectures Planned: 28		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Calculate the components of hydrological cycle.

CO2. Apply the basis knowledge in design dam.

CO3. Do flood frequency analysis and flood routine.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**INTRODUCTION: DEFINITIONS**, functions and advantages of irrigation, Present status of irrigation in India
3	2	Classification for agriculture, soil moisture and crop water relations
4	2	Irrigation water quality. Consumptive use of water
5	2	Principal Indian crop seasons and water requirements
6	**3**	**CANAL IRRIGATION:** Types of canals, design of channels
7	3	Regime and semi theoretical approaches (Kennedy's Theory, Lacey's Theory)
8	3	Diversion Head works: Design for surface and subsurface flows
9	3	Bligh's and Khosla's methods
10	**4**	**EMBANKMENT DAMS:** Suitable sites
11	4	Causes of failures, stability and seepage analysis
12	4	Flow net, principles of design of earth dams

13	4	Gravity Dams: Force acting on a gravity dam, stability requirements
14	**5**	**WELL IRRIGATION:** Open wells and tube wells
15	5	Types of tube wells, duty of tube well water
16	5	Cross-Drainage Structure: Necessity of Cross drainage structures, their types and selection
17	5	Comparative merits and demerits
18	**6**	**HYDROLOGY:** Definition, Hydrologic cycle
19	6	Measurement of rainfall, Flood hydrograph
20	6	Flood hydrograph
21	6	Rainfall analysis, Infiltration
22	6	Run off
22	6	Unit hydrograph and its determination
23	6	Unit hydrograph and its determination
24		Revision to coursework
25		Revision to coursework
26		Revision to coursework
27		Revision to coursework
28		Revision to coursework

TEXT/REFERENCE BOOKS

1. Irrigation Water Power and Water Resource Engineering by KR Arora, Standard Publishers and Distributers, Delhi.
2. Water Resource Engineering by Modi, Standard Publishers.
3. Irrigation and Water Power Engineering by BC Punmia & B B Lal, Laxmi Publication (P) Ltd.
4. Irrigation Engineering by G.L. Asawa, New Age International Publishers, New Delhi.

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Syllabus Deployment

Name of Faculty	: Mr. Rakesh Yadav	Subject Code: 5CE4-21
Subject	: Concrete Structures Design	
Department	: Civil Engineering	Sem: V
Total No. of Labs Planned: 13		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: To design various components of the structures.

CO2: Study the development length and shear reinforcement.

CO3: To design the axially loaded column, isolated column footing.

Lab No.	Exp. No.	Topic
1	1	Revision of Typical problems of BMD and SFD
2	2	Analysis and Design of singly reinforced rectangular beam section for Flexure, based on Working stress design philosophy.
3	3	Analysis and Design of singly reinforced rectangular beam section for Flexure, based on Limit State design philosophy
4	4	Analysis and Design of doubly reinforced rectangular beam section For flexure, based on Limit State design philosophy
5	5	Analysis and Design of flanged beam section for flexure, based on Limit State design philosophy
6	6	Problems on Limit state of serviceability for deflection as per codal Provisions of empirical coefficients.
7	6	Analysis and design of prismatic sections for shear using LSD
8	8	Problems on limit state of collapse in bond
9	9	Analysis and design of one way slabs using LSM
10	10	Analysis and design of two way slabs using LSM

11	11	Analysis and design of short axially loaded columns
12	12	Analysis and design of footing
13	13	Analysis and Design of beams for torsion as per codal method

Techno India NJR Institute of Technology

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Syllabus Deployment

Name of Faculty	: Mr. Bhupendra Purohit	Subject Code: 5CE4-22
Subject	: Geotechnical Engineering Lab	
Department	: Civil Engineering	Sem: V
Total No. of Lectures Planned: 10		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. To identify the index properties of soils

CO2. To determine the field density by sand replacement method

CO3. To find all consistency limits for soil.

Lab No.	Exp. No.	Topic
1	0	Introduction: Objective, scope and outcome of the practical's
2	1	Grain size distribution by sieve and hydrometer analysis
3	2	Determination of specific gravity by pycnometer
4	3	Determination plastic limit and shrinkage limit
5	4	Density by core cutter and sand replacement method
6	5	Direct shear and Triaxial test
7	6	Free swell index and swelling pressure test
8	7	CBR test of soil
9	8	Consolidation test of soil
10	9	Permeability of soil by constant band falling head test

TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY

Techno India NJR Institute of Technology

Academic Administration of Techno NJR Institute
Syllabus Deployment

Name of Faculty	: Mr. Jitendra Choubisa	Subject Code: 5CE4-23
Subject	: Water Resource Engineering Design	
Department	: Civil Engineering	Sem: V
Total No. of Lectures Planned: 10		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Able to impart a knowledge of Design & Analysis of water harvesting and conservation structure.

CO2. Able to impart a knowledge of Design & Analysis of river training & bank protection works

CO3. To understand an estimation and analysis of run off, unit hydrograph, flood hydrograph

Lecture No.	Practical	Topic
1	1	Irrigation water quality. Consumptive use of water
2	2	Irrigation water quality. Consumptive use of water
3	3	Design for surface and subsurface flows
4	4	Design for surface and subsurface flows
5	5	Kennedy's Theory, Lacey's Theory)
6	6	stability and seepage analysis
7	7	stability and seepage analysis
8	8	Gravity Dams: Force acting on a gravity dam, stability requirements
9	9	Gravity Dams: Force acting on a gravity dam, stability requirements
10	10	Infiltration, Run off

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TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY

Techno India NJR Institute of Technology
Academic Administration of Techno NJR Institute
Syllabus Deployment

Name of Faculty	: Mr. Bhupendra Purohit	Subject Code: 5CE5-13
Subject	: Town Planning	
Department	: Civil Engineering	Sem: V
Total No. of Lectures Planned: 28		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Explain different types of buildings depending upon their uses and occupancy level.

CO2. Explain basic criteria for planning an industrial and residential buildings.

CO3. Explain building by laws.

Lecture no.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**INTRODUCTION: DEFINATION** of town planning and Evolution of town planning
3	2	Object of town planning and Economic justice of town planning
4	2	Principal of town planning and necessity of town planning
5	2	Origin growth and pattern of town development
6	2	Distribution of land use and ideal site for towns
7	2	Power requirements to enforce T.P scheme
8	**3**	**CIVIC SURVEY**: Definition and necessity of civic survey
9	3	Collection of Data and type of survey use
10	3	Methods collection of data, drawing and report
11	**4**	**ZONING:** Destination, use of land, object of Zoning
12	4	Principal, aspects, importance of Zoning
13	4	Transition zone, zone powers, Map for zoning
14	**5**	**DEMAND OF HOUSING:** Importance, demand, classification of housing
15	5	Requirements and design of residential buildings

16	5	House agency and housing problem in India
17	**6**	**SLUMS:** Causes and characteristics of slums
18	6	Effect of slum and slum clearance
19	**7**	**INDUSTRIES:** Classification of industries
20	7	Concentration and Requirement of industries
21	7	Industrial township
22	**8**	**PUBLIC BUILDINGS:** Location, classification and principal of design
23	8	Town center and grouping of public buildings
24	8	Town center and grouping of public buildings
25	**9**	**REPLANTING OF EXISTING TOWN**: Object of replanting and defect of existing town
26	9	Data requirements and urban renewal projects
27	9	De- centralization and Re- Centralized
28	9	Garden city concept and overview.

TEXT/REFERENCE BOOKS

1. Town planning by S.C. Rangwala.
2. Planning and Urban Design Standards by Frederick Steiner and Kent Butler.
3. Town Planning in Practice: An Introduction to the Art of Designing Cities and Suburbs by Raymond Unwin.

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Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Lokesh Puri Goswami	Subject Code: 5CE5-14
Subject	: Repair & Rehabilitation of Structures	
Department	: Civil Engineering	Sem: V
Total No. of Lectures Planned: 28		

COURSE OUTCOMES HERE (4 OUTCOMES)

At the end of this course students will be able to:

CO1. Assess strength and materials deficiency in concrete structures.

CO2. Suggest methods and techniques used in repairing / strengthening existing concrete structures.

CO3. Apply Non-Destructive Testing techniques to field problems.

CO4. Apply cost effective retrofitting strategies for repairs in buildings.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**DETERIORATION OF CONCRETE STRUCTURES:** Penetrability of concrete- permeability
3	2	Sorptivity, diffusion. Physical processes- abrasion, erosion
4	2	Chemical - carbonation, chloride and sulfate attack
5	2	Alkali – Aggregate Reaction. Corrosion- mechanism.
6	2	Factors affecting and Preventive measures: for all the above
7	2	Water – proofing techniques for various conditions
8	2	Sacrificial anode, corrosion resistant steel
9	2	Corrosion inhibitors, protective coatings etc.

10	**3**	**CRACKS** in Concrete and Masonry Structures- Types of cracks
11	3	Patterns of cracks
12	3	Measurement and preventive measures
13	**4**	**ASSESSMENT OF RISK/DAMAGE IN STRUCTURES:** Preliminary investigation- visual, history collection etc
14	4	Detailed Investigation: core cutting, rebar locator, corrosion meter, penetration resistance,
15	4	Pull out tests, half–cell potential, concrete resistivity etc
16	4	Interpretation of nondestructive test data from all the above tests as well as rebound hammer number and ultra-sonic pulse velocity
17	4	Destructive and chemical tests- on material samples from site.
18	**5**	**MATERIALS FOR REPAIR:** Polymers and resins
19	5	Self-curing compounds, FRP
20	5	Ferro-cement- properties, selection criterion
21	5	Cement based, and polymer modified mortars etc
22	**6**	**REPAIR TECHNIQUES:** Grouting
23	6	Jacketing
24	6	External bonded plates- processes, limitations
25	6	Design computations etc
26	6	Design computations etc. Including numerical problems
27	6	Under Water Repair: Processes
28	7	**CASE STUDIES:** Related to rehabilitation of bridge piers, heritage structures, masonry structures etc

TEXT/REFERENCE BOOKS

1. Properties of Concrete by A.M. Neville, Pearson.
2. Concrete Technology by M.S. Shetty, S. Chand & Comp.
3. Hand Book of Analytical Techniques in Concrete Tech by V.S. Ram Chandran, Standard Publishers.

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Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Bharat Suthar	Subject Code: 6CE3-01
Subject	: Wind & Seismic Analysis	
Department	: Civil Engineering	Sem: VI
Total No. of Lectures Planned: 30		

COURSE OUTCOMES HERE (4 OUTCOMES)

At the end of this course students will be able to:

CO1. Understand the types of structures, symmetry and asymmetry in building forms, shear walls and multi-storey configurations.

CO2. Analyze design loads for different types of buildings.

CO3. Calculate wind load on flat roof, pitched roof and single sloped roof buildings.

CO4. Calculate earthquake loads on framed structures and design of Earthquake Resistant Construction.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**STRUCTURAL SYSTEMS:** Types of structures and Structure's forms,
3	2	Symmetry and Asymmetry in building forms
4	2	Vertical and lateral load resting elements
5	2	Shear walls, framed tubes and various multistory configurations
6	**3**	**DESIGN LOADS:** various types of loads and relevant codes
7	3	Design loads for different types of buildings
8	3	(IS-875 part 1 & 2) & Load Flow Concept

9	**4**	**WIND LOADS ANALYSIS:** Wind loads & calculation of wind load on flat roof
10	4	Wind loads & calculation of wind load on flat roof
11	4	Wind loads & calculation of wind load on flat roof
12	4	Wind loads & calculation of wind load on pitched roof
13	4	Wind loads & calculation of wind load on pitched roof
14	4	Wind loads & calculation of wind load on pitched roof
15	4	Wind loads & calculation of wind load on single sloped roof buildings
16	4	Wind loads & calculation of wind load on single sloped roof buildings
17	**5**	**EARTHQUAKE LOAD ANALYSIS:** Earthquake loads & calculations of Earthquake loads on framed structures. (IS: 1893 – Part 1)
18	5	Numerical Practice on calculations of Earthquake loads
19	5	Numerical Practice on calculations of Earthquake loads
20	5	Numerical Practice on calculations of Earthquake loads
21	5	Numerical Practice on calculations of Earthquake loads
22	5	Numerical Practice on calculations of Earthquake loads
23	**6**	**EARTHQUAKE RESISTANT CONSTRUCTION:** Typical seismic failure of masonry and RCC structures
24	6	Earthquake resistant construction of buildings, and various provisions as per IS codes IS-4326, IS-13827, IS-13828, IS-13920, IS-13935
25	6	Numerical Problems on Earthquake resistant construction
26	6	Numerical Problems on Earthquake resistant construction
27	6	Numerical Problems on Earthquake resistant construction
28	6	Numerical Problems on Earthquake resistant construction
29		Revision Of course work
30		Revision Of course work

TEXT/REFERENCE BOOKS

1. I.S. 1893 - 2002, Criteria for Earthquake Resistance design of Structures.
2. Pankaj Agarwal and Manish Shrikhande, Earthquake resistant design of structures, PHI 2006.

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Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Nishant Sharma	Subject Code: 6CE4-02
Subject	: Structural Analysis - II	
Department	: Civil Engineering	Sem: VI
Total No. of Lectures Planned: 54		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Distinguish between stable and unstable and statically determinate and indeterminate structures. Apply equations of equilibrium to structures and compute the reactions

CO2. Derive the shear and bending moment equations. Draw the shearing force and bending moment diagrams.

CO3. Calculate the internal forces in cable and arch type structures. Evaluate and draw the influence lines for reactions, shears, and bending moments in beams and girders due to the moving.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**UNIT LOAD METHOD & THEIR APPLICATIONS:** Deflection of determinate beams and frames
3	2	Deflection of determinate beams and frames
4	2	Deflection of determinate beams and frames
5	2	Analysis of determinate and redundant frames up to 2 degree of redundancy
6	2	Analysis of determinate and redundant frames up to 2 degree of redundancy, lack of fit in redundant frames

7	2	Introduction to Energy Methods: strain energy for gradually applied, suddenly applied and impact loads
8	2	Strain energy due to axial loads, bending, shear and torsion
9	2	Castiglione's theorems & their applications in analysis of determinate & redundant frames up to 2 degree of redundancy and trussed beams
10	2	(Contd.) Castiglione's theorems & their applications
11	2	(Contd.) Castiglione's theorems & their applications
12	2	(Contd.) Castiglione's theorems & their applications
13	2	Stresses due to temperature & lack of fit in redundant frames.
14	2	Stresses due to temperature & lack of fit in redundant frames
15	2	Deflection of determinate beams, frames using energy methods
16	2	Deflection of determinate beams, frames using energy methods
17	3	Influence line diagram & Rolling load: ILD for beams & frames
18	**3**	**NUMERICAL ON ILD FOR BEAMS**
19	3	Numerical on ILD for beams
20	3	Numerical on ILD for beams
21	3	Numerical on ILD for trusses
22	3	Numerical on ILD for trusses
23	3	Numerical on ILD for trusses
24	3	Muller-Breslau principle and its application for drawing ILD
25	3	(Contd.) Muller-Breslau principle
26	3	(Contd.) Muller-Breslau principle
27	3	(Contd.) Muller-Breslau principle
28	3	Maximum stress resultants in a member
29	3	Maximum stress resultants in a member
30	**4**	**ARCHES:** Analysis of three hinged parabolic Arches with supports at the same level and at different levels
31	4	(Contd.) Analysis of three hinged parabolic
32	4	(Contd.) Analysis of three hinged parabolic
33	4	Analysis of two hinged parabolic Arches with supports at the same level and at different levels
34	4	(Contd.) Analysis of two hinged parabolic
35	4	(Contd.) Analysis of two hinged parabolic

36	4	(Contd.) Analysis of two hinged parabolic
37	4	Analysis of fixed type parabolic Arches with supports at the same level and at different levels
38	**5**	**UNSYMMETRICAL BENDING:** Definition, location of NA
39	5	Computation of stresses and deflection
40	5	Computation of stresses and deflection
41	5	Shear center and its location.
42	5	Shear center and its location
43	5	Shear center and its location
44	**6**	**APPROXIMATE METHODS FOR LATERAL LOADS :** Analysis of multistory frames by portal method
45	6	(Contd.) Portal Method
46	6	(Contd.) Portal Method
47	6	(Contd.) Portal Method
48	6	(Contd.) Portal Method
49	6	Cantilever method & factor method
50	6	(Contd.) Cantilever method & factor method
51	6	(Contd.) Cantilever method & factor method
52	6	(Contd.) Cantilever method & factor method
53	6	Analysis of determinate space trusses by tension coefficient method
54	6	(Contd.) tension coefficient method

TEXT/REFERENCE BOOKS

1. Strength of Materials & Mechanics of Structures: Vol. I by Dr. B.C. Punmia Laxmi Publications (p) Ltd.
2. Theory of Structure by Jangid & Negi, Tata Mc Graw Hill.
3. Structural Analysis by Hibbler R.C., Pearsons.

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Dr. Sangeeta Choudhary	Subject Code: 6CE4-03
Subject	: Environmental Engineering	
Department	: Civil Engineering	Sem: VI
Total No. of Lectures Planned: 42		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Analyze characteristics of water and wastewater.

CO2. Estimate the quantity of drinking water and domestic wastewater generated.

CO3. Explain the several types of water demands.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**WATER:** Sources of Water and quality issues
3	2	Water quality requirement for different beneficial uses
4	2	Water quality standards, water quality indices
5	2	Water quality standards, water quality indices
6	2	Water Supply systems, Need for planned water supply schemes
7	2	Water Supply systems, Need for planned water supply schemes
8	2	Water demand industrial and agricultural water requirements
9	2	Components of water supply system; Transmission of water, Distribution system.
10	2	(Contd.) Components of water supply system
11	2	Various valves used in W/S systems, service reservoirs and design.

12	2	Water Treatment: Aeration, sedimentation
13	2	Coagulation flocculation,
14	2	Filtration.
15	2	Disinfection
16	2	Advanced treatments like adsorption, ion exchange, membrane processes
17	**3**	**SEWAGE:** Domestic and Storm water, Quantity of Sewage
18	3	Sewage flow variations. Conveyance of sewage- Sewers
19	3	Shapes design parameters, operation and maintenance of sewers
20	3	Sewage pumping; Sewerage, Sewer appurtenances, Design of sewerage systems
21	3	Small bore systems, Storm Water- Quantification and design of Storm water
22	3	Sewage characteristics: Quality parameters: BOD, COD
23	3	TOC, solids, DO, nitrogen, phosphorus.
24	3	Standards of disposal into natural watercourses and on land, Indian standards
25	3	Sewage and Sullage
26	3	Pollution due to improper disposal of sewage
27	3	Pollution due to improper disposal of sewage
28	3	Wastewater treatment: aerobic and anaerobic treatment systems
29	3	Aerobic and anaerobic treatment systems
30	3	Suspended and attached growth systems
31	3	Recycling of sewage – quality requirements for various purposes
32	3	Wastewater Disposal and Refuse: Disposal of sewage by dilution
33	3	Self-purification of streams
34	3	Sewage disposal by irrigation sewage farming
35	3	Waste water reuse
36	**4**	**AIR:** Composition and properties of air, Quantification of air Pollutants
37	4	Monitoring of air pollutants, Air quality standards
38	4	Control measures for Air pollution
39	**5**	**NOISE- BASIC CONCEPT,**
40	5	Measurement and various control methods
41		Revision to course work
42		Revision to course work

TEXT/REFERENCE BOOKS

1. S.K. Garg (1999), Water supply Engineering – Environmental Engineering (Vol.I) – Khanna Publishers.
2. P.N. Modi (2006), Water supply Engineering – Environmental Engineering (Vol.I) – Standard Book House.
3. S.K. Garg (1999), Sewage Disposal and Air Pollution Engineering – Environmental Engineering (Vol.II) – Khanna Publishers.

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Rakesh Yadav	Subject Code: 6CE4-04
Subject	: Design of Steel Structures	
Department	: Civil Engineering	Sem: VI
Total No. of Lectures Planned: 40		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: To know the basic properties of steel and to understand the behavior according to it.

CO2: To know the different steel structure analysis and design.

CO3: To know the design and analysis of angle sections, bolted & welded.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**TYPES OF STEELS** and their broad specifications. Structural steel forms- hot rolled, tubular, light gauge etc. and their applicability
3	2	Classification of cross sections as per IS 800-2007- Plastic, compact, semi compact and slender- characteristics
4	**3**	**PLASTIC ANALYSIS OF STEEL STRUCTURES**, fundamentals
5	3	Shape factor
6	3	Static and mechanism method of analysis
7	3	Static and mechanism method of analysis
8	3	Static and mechanism method of analysis
9	3	Bending of beams of uniform cross sections (any shape)

10	**4**	**CONNECTIONS:** Types of bolts, load transfer mechanism, prying action
11	4	Design of bolted connection under axial & eccentric loadings
12	4	Design of welded connection under axial & eccentric loadings
13	**5**	**TENSION MEMBERS:** Design strength in gross section yielding
14	5	net section rupture and block shear
15	5	Design of axially loaded members
16	**6**	**COMPRESSION MEMBERS:** Types of buckling, Imperfection factor, Buckling curves for different cross sections as per IS
17	6	Design of compression members: Axially loaded columns
18	6	(Contd.) Design of compression members
19	6	Built up columns including design of lacings and battens as per IS
20	6	(Contd.) Built up columns including lacings
21	**7**	**BEAMS:** Design of beams: simple and compound sections
22	7	(Contd.) Design of beams
23	7	Design of laterally supported and unsupported beams
24	7	(Contd.) Design of beams
25	7	Web crippling, lateral torsional buckling
26	**8**	**MEMBER DESIGN UNDER COMBINED FORCES**: Compressive load and Uniaxial moment
27	8	(Contd.) Member design under combined forces
28	**9**	**COLUMN BASES:** Design of column bases for axial and eccentric Compressive loads: Slab and gusseted base
29	9	Design of slab base
30	9	(Contd.) Design of slab base
31	**10**	**DESIGN OF PLATE GIRDER**: Design of welded and bolted sections including web and flange splicing
32	10	(Contd.) Design of plate girder
33	10	Curtailment of flange plates. Connections for flange plate to flange angles and flange angles to web
34	10	Design of welded connections
35	**11**	**DESIGN OF GANTRY GIRDER**
36	**12**	**Introduction to Pre Engineered Buildings**
37	**13**	**Introduction of truss girder bridges**

38		Revision
39		Revision
40		Revision

TEXT/REFERENCE BOOKS

1. Design of Steel Structures by S.K. Duggal, TMH Publication.
2. Design of Steel structures by S. S. Bhavikatti, I.K. International Pvt. Ltd.
3. IS-800-2007.

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Jitendra Choubisa	Subject Code: 6CE4-05
Subject	: Estimating & Costing	
Department	: Civil Engineering	Sem: VI
Total No. of Lectures Planned: 40		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. To prepare the estimations for road, building, canal structures.

CO2. Draft details specifications and work out rate analysis of projects.

CO3. Prepare costs estimation of civil engineering works.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION** to scope, objective and outcome of subject
2	**2**	**PURPOSE AND IMPORTANCE** of estimates, principles of estimating
3	2	Methods of taking out quantities of items of work.
4	2	Mode of measurement
5	2	Numerical on Long wall & Short wall method
6	2	Numerical on Long wall & Short wall method
7	2	Numerical on Long wall & Short wall method
8	2	Numerical on Long wall & Short wall method
9	2	Measurement sheet and abstract sheet; bill of quantities
10	**3**	Types of estimate plinth area rate, cubical content rate
11	3	Types of estimate preliminary, original, revised and supplementary estimates

12	3	Revised and supplementary estimates
13	**3**	Revised and supplementary estimates
14	**4**	**RATE ANALYSIS:** Task for average artisan
15	4	Various factors involved in the rate of an item
16	4	Material and labor requirement for various trades
17	4	Preparation for rates of important items of work
18	**4**	Current schedule of rates. (C.S.R.)
19	4	Current schedule of rates. (C.S.R.)
20	5	**DETAILED ESTIMATES:** Preparing detailed estimates
21	5	Numerical on Detailed Estimates
22	5	Numerical on Detailed Estimates
23	5	Numerical on Detailed Estimates
24	5	Numerical on Detailed Estimates
25	5	Numerical on Detailed Estimates
26	5	Numerical on Detailed Estimates
27	5	Services for building such as water supply, drainage & electrification
28	5	Services for building such as water supply, drainage & electrification
29	5	Services for building such as water supply, drainage and electrification
30	5	Estimating of culverts
31	5	Estimating of culverts
32	6	**VALUATION:** Purposes, depreciation
33	6	Sinking fund, scrap value
34	6	Year's purchase, gross and net income
35	6	Dual rate interest, methods of valuation
36	6	Dual rate interest, methods of valuation
37	6	Rent fixation of buildings
38		Revision of course work
39		Revision of course work
40		Revision of course work

TEXT/REFERENCE BOOKS

1. Chakraborti, M, Estimation, costing, specifications and valuation in civil engineering – National Halftone Co. Calcutta, 2005.
2. Dutta B.N., Estimation and costing in civil engineering: theory and practice – UBS Publishers Distributors Ltd, 2006
3. Birdie, G.S. - Estimation and costing in civil engineering – Dhanpat Rai Publishing co. ltd.

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Syllabus Deployment

Name of Faculty	: Mr. Bhupendra Purohit	Subject Code: 6CE4-21
Subject	: Environmental Engineering Design and Lab	
Department	: Civil Engineering	Sem: VI
Total No. of Labs Planned: 9		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Able to impart knowledge on sewage generation and system and designing primary treatment of sewage.

CO2. Build knowledge on water quality, conveyance and treatment of supply water

CO3. Realize importance of population forecasting and investigating quality of water for design of effective water treatment plant.

Lab No.	Exp No.	Topic
1	0	Introduction: Objective, scope and outcome of the practical's
2	1	Physical characteristics of water
3	2	Analysis of solid content in water
4	3	Alkalinity, acidity and hardness test of water
5	4	Optimum coagulant dose
6	5	Chemical oxygen demand COD
7	6	Dissolve oxygen and Biologicals oxygen demand
8	7	Break point chlorination
9	8	Bacteriological quality measurements

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Syllabus Deployment

Name of Faculty	: Mr. Rakesh Yadav	Subject Code: 6CE4-22
Subject	: Steel Structures Design	
Department	: Civil Engineering	Sem: VI
Total No. of Labs Planned: 6		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Able to get the knowledge about design of joints and design of structural steel members subjected to tensile and compressive force.

CO2. Able to design the beams and columns under various loading and supporting conditions..

CO3. Able to know the design of structural systems such as roof trusses.

Lab No.	Exp. No.	Name of Experiment
1	1	Case study of foot over bridges/truss- girder bridge in vicinity home town of the students, preferably in groups of 8-10 students. A report including photographs marked with names and section details of different members in it
2	1	Case study of foot over bridges/truss- girder bridge in vicinity /home town of the students, preferably in groups of 8-10 students. A report including photographs marked with names and section details of different members in it
3	1	Case study of foot over bridges/truss- girder bridge in vicinity home town of the students, preferably in groups of 8-10 students. A report including photographs marked with names and section details of different members in it
4	2	Case study of a structure using tubular sections or light gauge sections in vicinity /hometown of the students, preferably in groups of 8-10 students. A report including photographs marked with names, size and section details of different members in it

5	2	Case study of a structure using tubular sections or light gauge sections in vicinity /hometown of the students, preferably in groups of 8-10 students. A report including photographs marked with names, size and section details of different members in it
6	2	Case study of a structure using tubular sections or light gauge sections in vicinity /hometown of the students, preferably in groups of 8-10 students. A report including photographs marked with names, size and section details of different members in it

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Syllabus Deployment

Name of Faculty	: Mr. Lokesh Puri Goswami	Subject Code: 6CE5-12
Subject	: Solid and Hazardous Waste Management	
Department	: Civil Engineering	Sem: VI
Total No. of Lectures Planned: 30		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: To know about the solid waste management and disposal techniques.

CO2: To know the waste management rules to generators of solid waste and its generation rate.

CO3: To know about the biomedical waste management and hazardous solid waste.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**INTRODUCTION TO SWM**: Definition of waste and solid waste, classification solid waste.
3	2	Sources of solid waste, its composition.
4	2	Factors affecting waste generation
5	2	Traditional methods of waste collection and disposal
6	**3**	**WASTE COLLECTION:** Components of waste collection.
7	3	Waste collection containers, their characteristics, types.
8	3	Waste collection vehicles, collection frequency, collection route, transfer stations
9	3	Waste collection vehicles, collection frequency, collection route, transfer stations
10	**4**	**SOLID WASTE CHARACTERIZATION**: Physical characteristics.

11	4	Solid Waste Characterization: Chemical characteristics.
12	4	Solid Waste Characterization: Biological characteristics.
13	4	Waste Processing: Size reduction, factors affecting size reduction
14	4	Size reducing equipment, volume reduction, equipment for volume reduction, waste minimization, waste hierarchy, 3 R principle
15	**5**	**HAZARDOUS WASTE:** Definition, sources, classification, collection, segregation, treatment and disposal methods
16	5	Classification, collection, Segregation, treatment and disposal methods
17	5	Segregation, treatment and disposal methods
18	5	Radioactive Waste, E-Waste, Biomedical Waste: Definition, sources
19	5	Classification, segregation
20	5	Management and disposal Methods
21	**6**	**TREATMENT AND DISPOSAL OF SOLID WASTE:** Composting, vermicomposting.
22	6	Composting, vermicomposting.
23	6	Biogas production, thermal treatment, incineration, pyrolysis, gasification.
24	6	Biological treatment, Sanitary land filling
25	6	Land fill leachate and gas management
26	6	Latest Advances and Rules related to SWM, Hazardous Waste, Plastic Waste and E-Waste Management
27	6	(Contd.) Latest Advances and Rules related to SWM
28	6	(Contd.) Latest Advances and Rules related to SWM
29		Revision of course work
30		Revision of course work

TEXT/REFERENCE BOOKS

1. Tchobanoglous G, Theisen H and Vigil SA 'Integrated Solid Waste Management, Engineering Principles and Management Issues' McGraw-Hill, 1993.
2. Vesilind PA, Worrell W and Reinhart D, 'Solid Waste Engineering' Brooks/Cole Thomson Learning Inc., 2002.
3. Peavy, H.S, Rowe, D.R., and G. Tchobanoglous, 'Environmental Engineering', McGraw Hill Inc., New York, 1985.

Techno India NJR Institute of Technology
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Syllabus Deployment

Name of Faculty	: Mr. Bhupendra Purohit	Subject Code: 6CE5-16
Subject	: GIS & Remote Sensing	
Department	: Civil Engineering	Sem: VI
Total No. of Lectures Planned: 30		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Understand main concepts that define Geographic Information Systems. Describe the geographic space with concepts and terms commonly used to build operating models in GIS

CO2. Use diverse techniques and instruments adequately to measure, locate and find bearings on a map and in a field.

CO3. Photo-interpret basic environmental and socioeconomic variables using photographs taken in Spain.

Lecture No.	Unit	Topic
1	**1**	**INTRODUCTION:** Objective, scope and outcome of the course
2	**2**	**PHOTOGRAMMETRY:** Definition of Photogrammetric Terms, Geometry of aerial and terrestrial photographs
3	2	Aerial camera and photo theodolite, Scale of a Photograph
4	2	Tilt and Height displacements, Stereoscopic vision and stereoscopes
5	2	Height determination from parallax measurements
6	2	Flight planning
7	2	Maps and Map substitutes and their uses
8	**3**	**REMOTE SENSING:** Introduction & definition of remote sensing terms

9	3	Remote Sensing System
10	3	Remote Sensing System
11	3	Electromagnetic radiation and spectrum
12	3	Spectral signature, Atmospheric windows
13	**4**	**DIFFERENT TYPES OF PLATFORMS,** sensors and their characteristics
14	4	Different types of platforms, sensors and their characteristics
15	4	Orbital parameters of a satellite
16	4	Multiconcept in Remote Sensing
17	**5**	**IMAGE INTERPRETATION:** Principles of interpretation of aerial and Satellite images.
18	5	Equipment's and aids required for interpretation
19	5	Ground truth – collection and verification
20	5	Advantages of multidate and multiband images
21	5	Digital Image Processing concept
22	**6**	**GEOGRAPHIC INFORMATION SYSTEM (GIS) :** Introduction & applications of GIS in map revision
23	6	Geographic Information System (GIS)
24	6	Geographic Information System (GIS)
25	6	Land use, Agriculture, Forestry, Archaeology, Municipal
26	6	Geology, water resources, Soil Erosion
27	6	Land suitability analysis, change detection
28		Revision of course work
29		Revision of course work
30		Revision of course work

TEXT/REFERENCE BOOKS

1. Floyd F. Sabins, Remote Sensing Principles and Interpretation, W.H. Freeman and Co. 2007.
2. Lillisand T.M and Kiefer R.W, Remote Sensing and Image Interpretation, John Wiley and Sons, 2008.
3. Paul R. Wolf: Elements of Photogrammetry, with Air Photo Interpretation and Remote Sensing, McGraw Hill International Book Company, 2000.

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Syllabus Deployment

Name of Faculty	: Mr. Bharat Kr. Suthar	Subject Code: 6CE4-24
Subject	: Water and Earth Retaining Structures Design	
Department	: Civil Engineering	Sem: VI
Total No. of Labs Planned: 14		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. To understand the design aspects about retaining structures

CO2. Stability criteria of water and earth retaining structures

CO3. To understand the seepage problems in retaining structures

Lab No.	Exp. No.	Topic
1	1	Continuous Beams: Analysis and Design of continuous beams using coefficients (IS Code)
2	1	concept of moment redistribution
3	2	Curved Beams: Analysis and design of beams curved in plan
4	2	Curved Beams: Analysis and design of beams curved in plan
5	3	Circular Domes: Analysis and design of Circular domes with u.d.l. & concentrated load at crown
6	3	Circular Domes: Analysis and design of Circular domes with u.d.l. & concentrated load at crown
7	4	Water Tanks and Water Towers-design of rectangular
8	4	Water Tanks and Water Towers-design of circular
9	4	Water Tanks and Water Towers-design of Intze type
10	4	Water Tanks and Water Towers-design of Intze type
11	4	Water Tanks and Water Towers-design of column brace type staging
12	5	Analysis and design of Cantilever Retaining Walls

13	5	Introduction to counterfort and buttress type retaining walls
14	5	Retaining Walls: their structural behavior and stability analysis

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Syllabus Deployment

Name of Faculty	: Mr. Lokesh Puri Goswami	Subject Code: 6CE4-25
Subject	: Foundation Design	
Department	: Civil Engineering	Sem: VI
Total No. of Labs Planned: 9		

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. To design isolated shallow footings, combined footings, raft footings

CO2. To design retaining structures

CO3. To design pile foundation.

Lab No.	Experiment No.	Topic
1		Introduction: Objective, scope and outcome of the lab
2	1-A	Design of isolated shallow footings
3	1-B	Design of combined footings
4	1-C	Design of raft foundations
5	2	Design of pile foundations
6	3	Design of wells
7	3-A	Design of cassions
8	4	Design of machine foundation
9	5	Design of retaining structures

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Syllabus Deployment

Name of Faculty: Mr. Bharat Kr. Suthar	Subject Code: 7CE4-01
Department: Department of Civil Engineering	SEM: VII
Total No. of Lectures Planned: 40	Sub. Transportation Engineering

COURSE OUTCOMES HERE (4 OUTCOMES)

At the end of this course students will be able to:

CO1: Interpret geometric Design fundamentals.
CO2: Demonstrate traffic Control devices.
CO3: To study about these aspects of roads, railways and bridges so as to develop their understanding.

Lecture No.	Unit	Topic
1	1	Introduction: Objective, scope and outcome of the course.
2	2	Different modes of transportation, historical Development of road construction.
3	2	Highway Development in India –Classification of roads- Road pattern.
4	2	Highway planning in India- Highway alignment - Engineering Surveys for alignment – Highway Project- Important
5	2	Highway planning in India- Highway alignment - Engineering Surveys for alignment – Highway Project- Important
6	2	Transport/Highway related agencies in India. PMGSY project. Introduction about IRC, NRRDA
7	3	The highway crosses sectional elements- Camber-Sight Distance.
8	**3**	Types of sight distances- Discuss and Derivation on Stopping Sight Distance.
9	3	Discuss and Derivation on Overtaking Sight Distance.
10	3	Design of horizontal alignments - Super elevation.
11	3	Widening of Pavements on horizontal curves.
12	3	Transition Curves- Design of Vertical alignments – Gradients.
13	3	Summit and Valley Curves- Recommendations of IRC Codes of

		Practice.
14	4	Highway Materials: Desirable Properties.
15	4	Highway Materials: Testing Procedures.
16	4	Standards and standard values relating to Soil.
17	4	Discuss Properties on Stone Aggregates, Bitumen and Tar, fly-ash/pond-ash.
18	4	Role of filler in Bituminous mix, materials of filler.
19	4	Specifications of DLC and PQC for rigid pavement.
20	5	Methods of constructing different types of roads viz. Earth roads.
21	5	Methods of constructing different types of roads viz Stabilized roads, WBM.
22	5	Methods of constructing different types of roads viz WMM roads, earthen embankments.
23	5	DLC and embankments with fly ash. Bituminous roads and Concrete roads. Berms and Shoulders.
24	5	Features of rural roads including those in PMGSY. Hot mix plant for Bituminous roads-components, layout, control panel, quality assurance.
25	5	Highway construction of rigid and flexible pavements including types of road rollers.
26	5	Specifications of compaction of different layers of bituminous roads.
27	5	Modern pavers for CC roads. Roller compacted concrete road construction.
28	6	Design of Flexible Pavement.
29	6	Design of Flexible Pavement.
30	6	Design of Rigid Pavement.
31	6	Design of Rigid Pavement.
32	6	Numerical based on Rigid and Flexible Pavements.
33	7	Railway Engineering: Types and Selection of Gauges, Selection of Alignment, Ideal Permanent Ways.
34	7	Cross- sections in different conditions, Drainage, Salient Features and types of Components viz. Rails.
35	7	Discuss to Sleepers, Ballast, and Rail Fastenings.
36	8	Airport Engineering: - Introduction: Requirements to Airport Planning
37	8	Airport Classifications, Factors in Airport Site Selection, Airport Size
38	8	Planning of Airport: Requirements of Airport- Terminal Area,

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Syllabus Deployment

Name of Faculty: Mr. Bhupendra Purohit	Subject Code: 7AG6- 60.2
Department: Department of Civil Engineering	SEM: VII
Total No. of Lectures Planned: 40	Sub. Environmental Engineering & Disaster Management

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Students will understand the concept of management of resources and responsibilities for dealing with all humanitarian aspects of emergencies.

CO2. Students are taught to learn the issues such as floods, hurricanes, fires, mass failure of utilities, rapid spread of disease and droughts.

CO3. Students learn how to monitor signals and indicators of both natural and man-made threat for the ecosystem.

Lecture No.	Unit	Topic
1	1	Introduction: Objective, scope and outcomes of course.
2	2	Safe water supply: Introduction of safe water.
3	2	Importance of safe water system.
4	2	Domestic water requirements for urban.
5	2	Domestic water requirements for Rural.
6	2	Important water sources.
7	2	Intake of water sources.
8	2	transportation and supply of water
9	2	Revision of the chapter
10	2	Class test of the chapter.
11	3	Drinking water quality: Introduction of pure water.
12	3	Quality of drinking water.

13	3	Indian standard quality of drinking water.
14	3	Introduction of water treatment plant.
15	3	Types of water treatment methods.
16	3	Characteristics of pure water.
17	3	Importance of sanitation.
18	3	Introduction of sanitation
19	3	Revision of the chapter.
20	3	Class test of the chapter.
21	4	Domestic waste water: Introduction.
22	4	Quantity of domestic waste water.
23	4	Characteristics of waste water.
24	4	Disposal of waste water in urban. Urban.
25	4	Disposal of waste water in rural.
26	4	Introduction of sewer.
27	4	types of sewers
28	4	Discharge and Hydraulic design of sewer.
29	4	Introduction to domestic waste water treatment.
30	4	Revision of the chapter.
31	5	Solid waste: Introduction.
32	5	Quantity of solid waste.
33	5	Characteristics of solid waste.
34	5	Disposal of solid waste in urban and rural.
35	5	Introduction of Air pollution and type of pollutants.
36	5	Properties and effects of pollutants on living beings.
37	5	BIS standard of pollutants of air and their abetment.
38	5	Introduction of various disaster.
39	5	Importance of disaster management and revision.
40	5	Class test of the chapter.

TEXT/REFERENCE BOOKS

1. Introduction to International Disaster Management by Damon P. Coppola, Butterworth-Heineman.
2. Text Book of Disaster Management, Nitesh Kumar.
3. Disaster Management, Harsh Gupta, Elements of Strength of Materials by Timoshenko & Young, Mc Graw Hill Book Co.

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Syllabus Deployment

Name of Faculty: Mr. Bhupendra Purohit	Subject Code: 7CE4-24
Department: Department of Civil Engineering	SEM: VII
Total No. of Lab Planned: 10	Sub: Environmental Lab

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. Analyze characteristics of water and wastewater.

CO2. Estimate the quantity of drinking water and domestic wastewater generated.

CO3. Design components of water supply systems.

Lab No.	Exp. No.	Topic
1	1	Sewer design and estimate of waste water.
2	2	Design of water and sewage treatment plant.
3	3	Design of oxidation pond and stabilization of ponds
4	4	Design of aerobic and anaerobic digester
5	5	Demonstration of air pollution monitoring instruments and high volume samplers.
6	6	Determination of SPM, PM 10, PM 2.5.
7	7	Demonstration of noise pollution monitoring instruments.
8	8	Air quality monitoring for traffic and residential location and effects on environment.
9	9	Noise quality monitoring for traffic and residential location and

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Syllabus Deployment

Name of Faculty: Mr. Bharat Kr. Suthar	Subject Code: 7CE4-21
Department: Department of Civil Engineering	SEM: VII
Total No. of Lab Planned: 10	Sub: RMT Lab

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1. To determine the flakiness index, Angularity number test and fineness test of given sample of aggregate.

CO2. Conduct a meaningful hardness, tensile, and impact test and report of the test results in a clear and useful manner.

CO3. Able to understand and determine of Aggregate crushing value test, specific gravity and water absorption test of aggregates.

Lab No.	Exp. No.	Topic
1	1	Aggregate Impact Test.
2	2	To determine the Angularity Number, Flakiness Index & Elongation Index of aggregates.
3	3	Los Angeles Abrasion Test.
4	4	Aggregate Crushing Value Test.
5	5	Standard Tar Viscometer Test for given bitumen sample.
6	6	Ductility Test for a given bitumen sample.
7	7	. To determine the softening point for given sample of bitumen.
8	8	Marshall Stability Test.
9	9	Float Test.
10	10	Preparation of Dry lean concrete mix and testing of its strength.

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Syllabus Deployment

Name of Faculty:	Subject Code: 7CE4-23
Department: Department of Civil Engineering	SEM: VII
Total No. of Lab Planned: 10	Sub: Soft Skills Lab

COURSE OUTCOMES HERE (3 OUTCOMES)

At the end of this course students will be able to:

CO1: To develop interview skills

CO2: To develop positive attitude

CO3: To learn about Time management

Lab No.	Exp. No.	Topic
1	1	SOFT SKILLS- Introduction to Soft Skills, Aspects of Soft Skills, Identifying your Soft Skills
2	2	Negotiation skills, Importance of Soft Skills, Concept of effective communication
3	3	SELF-DISCOVERY- Self-Assessment, Process, Identifying strengths and limitations, SWOT analysis grid
4	4	PREPARING CV/RESUME – Introduction, meaning, difference among bio-data, CV and resume, CV writing tips
5	5	Do's and don'ts of resume preparation, Vocabulary for resume, common resume mistakes, cover letters, tips for writing cover letters
6	6	INTERVIEW SKILLS - Introduction. Types of interview, Types of question asked, Reasons for rejections, Post-interview etiquette
7	7	Telephonic interview, Dress code at interview, Mistakes during interview, Tips to crack on interview
8	8	Contextual questions in interview skills, Emotional crack an

		interview, Emotional intelligence and critical thinking during interview process
9	9	DEVELOPING POSITIVE ATTITUDE – Introduction, Formation of attitude, Attitude in workplace, Power of positive attitude, Examples of positive attitudes, Negative attitudes
10	10	Overcoming negative attitude and its consequences,
11	11	IMPROVING PERCEPTION- Introduction, Understanding perception, perception and its application in organizations
12	12	CAREER PLANNING – Introduction, Tips for successful career planning, Goal setting immediate, short term and long term, Strategies to achieve goals, Myths about choosing career
13	13	TEAM BUILDING AND TEAM WORK - Introduction, Meaning, Characteristics of an effective team, Role of a Team Leader
14	14	Role of Team Members, inter group Collaboration Advantages, Difficulties faced, Group Exercises-Team Tasks and Role-Play, Importance of Group Dynamics
15	15	TIME MANAGEMENT: The Time management matrix, apply the Pareto Principle (80/20 Rule) to time management issues, to prioritize using decision matrices, to beat the most common time wasters, how to plan ahead, how to handle interruptions , to maximize your personal effectiveness, how to say "no" to time wasters, develop your own individualized plan of action
16	16	STRESS MANAGEMENT – Introduction, meaning, positive and negative stress, Sources of stress, Case studies, signs of stress, Stress management tips, Teenage stress.
17	17	Group discussion practice on current topics, Quantitative aptitude and reasoning preparation

पंकज पोरवाल