Lesson Planning (Theory)

Branch : **Civil Engineering** Semester: **5th**

Subject: **Design of RCC Structures** Session: **August-December 2025**

Teacher: **Er. Harish Kumar** Class Room : **A-202**

S.No.	No. of WEEKS	Chaptor/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	2 WEEKS	**UNIT-I Introduction to R.C.C Designing using Limit State Method**	• Design Philosophies: Working Stress Theory, Ultimate Design Theory, Limit State Theory Concept of Reinforced Cement Concrete (RCC) Reinforcement Materials: • Suitability of Steel as reinforcing material • Properties of mild steel and HYSD steel • Loading on structure as per I.S 875. • Study of BIS:456-2000-clause5, clause6, clause9, Clause18, clause19, clause22, clause 23.0, 23.2, 23.3, Clause25, clause26, clause35, clause36, clause37, clause 38, clause 39, clause 40, clause 41, clause42, clause 43, Annexure–B, C, D, E, G	R1,R2,R3	
2	2 WEEKS	**UNIT-II Shear, Bond, and Development Length (LSM)**	• Nominal Shear stress in R.C. Section, Design shear strength of concrete, maximum shear stress, Design of shear reinforcement, Minimum shear reinforcement, Forms of shear reinforcement with numerical problems. • Bond and types of bonds, Bond Stress, check for bond stress, Development length in tension and compression, anchorage value for hooks 90° bend and 45° bend. Standard Lapping of bars, check for development length. • Determination of development length required for tension reinforcement of cantilevers beam and slab, check for development length.	R1,R2,R3	
3	2 WEEKS	**UNIT-III Analysis and Design of Singly Reinforced Sections**	• Limit State of collapse (Flexure), Assumption stress. Strain relationship for concrete and steel, neutral axis, Stress block diagram and Strain diagram for singly reinforced section. • Concept of under- reinforced, over-reinforced and balanced section, neutral axis, limiting value of moment of resistance and limiting percentage of steel required for balanced singly R.C. Section. • Simple numerical problems on determining d e s i g n c ons t a nts , m o m	R1,R2,R3	

			• Design of Singly reinforced simply supported beam and cantilever beam		
4	2 WEEKS	**UNIT-IV Analysis and Design of Doubly Reinforced Sections (LSM)**	• General features, necessity of providing doubly reinforced reinforcement, limitations. • Analysis of doubly reinforced section, strain diagram, stress diagram, depth of neutral axis, moment of resistance of the section. • Numerical problems on finding moment of resistance	R1,R2,R3	
5	2 WEEKS	**UNIT-V Design of One-Way Slab (LSM)**	• Analysis & Design of simply supported one-way slab	R1,R2,R3	
6	2 WEEKS	**UNIT-VI Two Way Slab (LSM)**	• Design of two-way simply supported slab with corners free & no provision for torsion reinforcement.	R1,R2,R3	
7	2 WEEKS	**UNIT-VII Design of Axially Loaded Column (LSM)**	• Assumptions in limit state of collapse– compression • Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square, and circular sections, diameter and spacing of lateral ties. (No numerical on helical ties). • Analysis and Design of axially loaded: Uniaxial & Biaxial Bending along with axial loading: short, square, rectangular, and circular columns with lateral ties only; check for short column and check for minimum eccentricity may be applied.	R1,R2,R3	

REFERENCE RESOURCES

- R1- Krishna Raju, and N. Pranesh, R.N., Reinforced Concrete Design Principles andPractice, New
- R2- Pillai, S.U., and Menon, Devdas, Reinforced concrete Design, McGraw Hill
- R3- Singh, Birender, Reinforced Cement Concrete Design, Kapson Publication

Signature of Teacher

Signature of H.O.D

Lesson Planning (Theory)

Branch : **Civil Engineering** Semester: **5th**

Subject : **Earthquake Resistant Building Design** Session : **August-December 2025**

Teacher: **Er. Anuj Rana** Class Room : **A-201**

S.No.	No. of WEEKS	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	2 WEEKS	Unit I: Elements of Engineering Seismology	• General features of tectonic of seismic regions • Causes of earthquakes • Seismic waves • Earth quake size (magnitude and intensity) • Epicenter • Seismograph • Classification of earthquakes • Seismic zoning map of India	R1,R2	
2	2 WEEKS	Unit II: Seismic Behaviour of Traditionally-Built Constructions of India	• Earth quake effects • Traditionally built construction in India • Performance of building during earthquakes and Mode of failure (Out of plane failure, in plane failure, Diaphragm failure, Connection failure, Non-structural components failure)	R1,R2	
3	2 WEEKS	Unit III: Introduction to IS1893 (Part-I)-2016	• Introduction • Assumptions • Design lateral forces and their calculation methods	R1,R2	
4	2 WEEKS	Unit IV: Ductile Detailing of Reinforced Concrete Buildings (IS 13920-2016) & IS 4326-2013)	• Common modes of failure in reinforced concrete buildings • General Principal for earthquake resistant buildings & Special construction features • Types of irregularities • Vertical irregularities • Plan irregularities • Ductile detailing as per code • Seismic strengthening arrangements • Horizontal reinforcement • Vertical reinforcement	R1,R2	
5	2 WEEKS	Unit V: Introduction to IS13828-1993 & IS13827-1993	• Advantages and disadvantages of masonry construction • Behaviour of masonry construction during earthquakes • Earthquake resistance features for burnt clay brick in weak mortar • Codal Provisions for earthquake resistant earthen construction • Seismic strengthening features of earthen buildings	R1,R2	
6	2 WEEKS	Unit VI:	• Introduction, need of retrofitting	R1,R2	

		Retrofitting Measure for Traditionally Built Construction	• Retrofitting materials • Retrofitting measure of traditionally built construction ▪ Retrofitting of masonry buildings ▪ Retrofitting of concrete structure ▪ Retrofitting of low-cost buildings		
7	**2 WEEKS**	**Unit VII: Disaster Management**	• Disaster rescue • Psychology of rescue, rescue workers, rescue plan, rescue by steps, rescue equipment • Safeties in rescue operations • Debris clearance • Causality management	R1,R2	

REFERENCE RESOURCES

- **R1**- Earthquake resistant building construction by Jagroop Singh, Rajiv Bhatia, Eagle Publication
- **R2**- Earthquake resistant building construction by Neelam Sharma, Katson

Signature of Teacher

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Lesson Plan (Theory)

Branch : CIVIL ENGG Semester : 5th

Subject : Precast and Pre-stressed Concrete Session : Aug-Dec 2025

Teacher: RANA KUNAL Class Room: A-201

S.No.	Weeks	Chapter / Unit Description	Detail of Contents	Reference Resources	Remarks
1	2 Weeks	Precast concrete Elements	• Advantages and disadvantages of precast concrete members • Non-structural Precast elements-Paver blocks, Fencing Poles, Transmission Poles, Manhole Covers, Hollow and Solid Blocks, kerb stones as per relevant BIS specifications • Structural Precast elements –tunnel linings, Canal lining, Box culvert, bridge panels, foundation, sheet piles	R1,R2	
2	2 Weeks	Prefabricated building	• Precast Structural Building components such as slab panels, beams, columns, footings, walls, lintels and chajjas, staircase elements, • Prefabricated building using precast load bearing and non-load bearing wall panels, floor systems-Material characteristics, Plans & Standard specifications • Prefab systems and structural schemes and their classification • Joints–requirements of structural joints • Manufacturing, storage, curing, transportation and erection of above elements, equipment needed	R1,R2	
3	2 Weeks	Introduction to Pre-Stressed Concrete	• Principles of pre-stressed concrete and basic terminology. • Applications, advantages and disadvantages of pre stressed concrete • Materials used and their properties, Necessity of high-grade materials • Types of Pre-stressing steel-Wire, Cable, tendon, Merits-demerits and applications	R1,R2	
4	4 Weeks	Methods and systems of pre-stressing	• Methods of pre-stressing–Internal and External pre-stressing, Pre and Post tensioning applications • Systems for pre tensioning– process, applications, merits and demerits-Hoyer system • Systems for post-tensioning – process, applications, merits and demerits – Freyssinet system, Magnel Blaton system, Gifford Udall system. • Loss of pre-stress occurring subsequently: losses	R1,R2	

			due to shrinkage of concrete, creep of concrete, elastic shortening, and creep in steel, (Simple Numerical problems to determine loss of pre-stress). • BIS recommendations for percentage loss in case of Pre and Post tensioning.		
5	4 Weeks	**Analysis and design of pre-stressed rectangular beam section**	• Basic assumptions in analysis of pre-stressed concrete beams. • Cable Profile in simply supported rectangular beam section–concentric, eccentric straight and parabolic • Effect of cable profile on maximum stresses at mid span and at support. • Numerical problems on determination of maximum stresses at mid spans with linear (con-centric and eccentric) cable profiles only. • Simple steps involved in Design of simply supported rectangular beam section	R1,R2	

REFERENCE RESOURCES

• R1- Krishna Raju, N., Pre-stressed Concrete, Tata McGraw Hill, New Delhi
•R-2 – Shrikant B. Vanakudre, Pre-stressed Concrete, Khanna Publishing House, New Delhi

Signature of Teacher with Date

Signature of H.O.D

LESSON PLAN

Name of Teacher :- Meenakshi Saini **Subject:** Life Skills for Professional and Personal Life (LSPPL) **Class:** 5th Semester Civil Engg.

S. No.	Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
1	August	2nd week	4,6,7,8	**Unit 1: Life Skills, Soft Skills & Interpersonal Skills:**	1. Definition of Life Skills and Soft Skills 2. Significance of Life Skills and Soft Skills in Personal and Professional life	
2		3rd week	11,13,14		3. Types of Soft skills and Life skills, Ways to develop Soft Skills and Life Skills.	
3		4th week	18,20,21,22		4. Concept of Interpersonal Skills and tips to improve Interpersonal Skills 5. Meaning of Team dynamics and Tips for improving Team dynamics	
4		5th week	25,27,28,29	**Unit 2. Communication Skills**	1. Meaning of Communication Skills 2. Significance and Characteristics of Assertive	
5	September	1st Week	1,3,4		3. Techniques of Assertive Communication 4. Tips to develop Assertive Communication	
			5	**Unit 3.Life Skills**	(A) Self Awareness: 1. Self Introspection (a) Meaning of Self awareness :Introspection, Self Reflection and Insight	
6		2nd Week	8		(A) Self Awareness: 1. Self Introspection (b) Strategies to improve self awareness	
			10	**Class Test-I**		
			11, 12	**Unit 3.Life Skills**	(A) Self Awareness: 1. Self Introspection (c) Importance of counseling and coaching 2. Stress Management (a) Meaning of Stress	
7		3rd Week	15,17		2. Stress Management b) Factors causing positive and negative types of stress (c) Effects of Stress on mind and body (d) Stress Management techniques	

7	September	3rd Week	18,19	Unit 3.Life Skills	3. Emotional Intelligence: (a) Meaning and Significance of EI (b)Strategies to develop and enhance Emotional Intelligence	
8	September	4th Week	22,24		4. Self-Esteem (a) Concept, Meaning and Significance of Self-Esteem (b) Types of Self-Esteem (c) Characteristics of people with High and Low Self -Esteem (d) Steps and Tips for improving Self-Esteem	
			25.26		(B) Social Awareness: 1. Meaning and Techniques of social awareness and social skills 2. Empathy: (a) Meaning and types of Empathy (b) Benefits of Empathy (c) Steps for developing Empathy	
9		5th Week	29		3. Compassion: (a) Meaning and Benefits of Compassion	
10	October	1st Week	1,3		3. Compassion:(b) Steps to practice Compassion. 4. Body Language: (a) Elements of Body Language (b) Develop Positive Body language that helps in building positive relationships (c) Avoiding Negative Body Language	
11		2nd Week	6,8,9		(C) Thinking Skills: 1. Positive Thinking (a) Meaning and Benefits of Positive Thinking (b) Tips to develop positive attitude and practice Positive Thinking (b) Tips to develop positive attitude and practice Positive Thinking 2. Listening Skills: (a) Concept, Significance and Process of Listening Skills	
12		3rd Week	13		2. Listening Skills: (b) Kinds of Listening	
			15	**Class test-II**		

12	October	3rd Week	16,17	**Diwali vacation**		
13		4th Week	22,24	**Unit 3.Life Skills**	2. Listening Skills: (c) Factors hindering effective Listening (d) Tips for Active and Empathetic Listening 3 Resilience: (a) Meaning and Types of Resilience (b) Case studies of Resilience	
14		5th Week	27,29,30,31	**Unit 4. Time Management Skills**	1. Concept and Significance of Time Management. 2. Benefits of Time Management	
15		2nd Week	**House Test**			
16		3rd Week	10,12,13	**Unit 4. Time Management Skills**	3. Tools and techniques of Time Management 4. How to overcome procrastination and avoid time-wasters	
			14	**Unit 5. Human Values and Ethics**	1. Meaning of Human values, Morals and Ethics	
17		4th Week	17,19		2. What is Value and types of values	
			20,21		3. Human Dignity and Humility: Meaning of Human Dignity and Fundamental rights of a person	
18		5th Week	24, 26		3. Human Dignity and Humility: Significance of humility, Developing and cultivating humility, Developing and cultivating humility	

Signature of HOD

Signature of Teacher

Lesson Planning (Theory)

Branch : **Civil Engineering** Semester : **5th**

Subject : **Water Resource Engineering** Session : **August-December 2025**

Teacher: **Er. Anuj Rana** Class Room : **A-201**

S.No.	No. of WEEKS	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	2 WEEKS	**Unit–I Introduction to Hydrology**	• Hydrology: Definition and Hydrological cycle • Rain Gauge: Symons rain gauge, automatic rain gauge, • Methods of calculating average rainfall: Arithmetic mean, Iso-hyetal, and Theissen polygon method. • Runoff, Factors affecting Runoff, Computation of run–off	R1,R2	
2	3 WEEKS	**Unit–II Crop water requirement and Reservoir Planning**	• Irrigation and its classification. • Crop Water requirement: Cropping seasons, Crop period, base period, Duty, Delta, CCA, GCA, intensity of irrigation, factors affecting duty, Problems on water requirement • Methods of application of irrigation water and its assessment. • Silting of reservoir, Rate of silting, factors affecting silting and control measures.	R1,R2	
3	3 WEEKS	**Unit–III Dams and Spillways**	• Dams and its classification: Earthen dams and Gravity dams (masonry and concrete). • Earthen Dams– Components with function, typical cross-section, seepage through embankment and foundation and its control. • Methods of construction of earthen dam, types of failure of earthen dam and preventive measures. • Gravity Dams–Forces acting on dam, Theoretical and practical profile, typical cross-section. (only theoretical concept) • Spillways-Definition, function & location	R1,R2	
4	2 WEEKS	**Unit–IV Minor and Micro Irrigation**	• Lift irrigation Scheme-Components and their functions, Layout. • Drip and Sprinkler Irrigation-Need, components, and Layout. • Well irrigation: types and yield of wells, advantages and disadvantages of well irrigation	R1,R2	
5	2 WEEKS	**Unit–V Diversion Head Works &Canals**	• Weirs–components, parts, types of weirs • Barrages–components and their functions. Difference between weir and Barrage.	R1,R2	

			Canals– Classification according to alignment and position in the canal network, Cross section of canal in embankment and cutting, partial embankment and cutting. • Canal lining-Purpose, material used and its properties, advantages. • Cross Drainage Works-Aqueduct, siphon aqueduct, super passage, level crossing. • Canal Regulators- Head regulator, Cross regulator, Escape, Falls and Outlets		
6	**2 WEEKS**	**Unit–VI Water logging**	• Definition, Causes, Preventive & remedial measures, Reclamation of waterlogged areas	R1,R2	

REFERENCE RESOURCES

- **R1**-Garg, SK, Irrigation and Hydraulic Structures, Khanna Publishers, Delhi
- **R2**-Punmia, B.C., Pande, B.Lal, Irrigation and Water Power Engineering, Laxmi Publications

Signature of Teacher

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Lesson Planning (Theory)

Branch : **Civil Engineering** Semester: **5th**

Subject : **Estimation and Costing** Session **August-December 2025**

Teacher: **Er. Saibal Bharti** Class Room : **A-202**

S.No.	No. of WEEKS	Chaptor/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	2 WEEKS	**Unit I: Introduction**	• Meaning of the terms estimating & costing. o Purpose of estimating and costing • Types of Estimates o Approximate and Detailed o Approximate estimate Types ▪ Plinth area rate method ▪ Cubic Content method ▪ Approximate Quantity method o Types of detailed estimate ▪ Detailed estimate for new work ▪ Revised estimate ▪ Supplementary estimate ▪ Repair & Maintenance estimate	R1,R2	
2	3 WEEKS	**Unit II: Measurement**	• Units of measurement for various items of work as per BIS: 1200 • Rules for measurements. • Different methods of taking out quantities– centre line method and long wall and short wall method	R1,R2	
3	2 WEEKS	**Unit III: Preparation of Detailed Estimates and Abstract of Cost**	• One & two room residential building with flat roof • Septic tank for 10 users	R1,R2,R3	
4	2 WEEKS	**Unit IV: Road Estimation**	• Plain road with-mid section area method, mean sectional area method, prismoidal formula. • Earth work in hill road.	R1,R2	
5	3 WEEKS	**Unit V: Analysis of Rates**	**Calculation of Quantities of Materials** • Cement mortars of different proportion • Cement concrete of different proportion • RCC work in different proportions • Brick/stone masonry in cement mortar • Plastering and pointing • Whitewashing, painting **Preparation of Detailed Analysis of Rates for finished items with given labour and rate of material** • Earthwork • Cement concrete of different proportion • RCC work in different proportions • Brick/stone masonry in cement mortar • Plastering and pointing • Whitewashing, painting	R1,R2	
6	2 WEEKS	**Unit VI: Contracts**	• Meaning of contract • Qualities of a good contractor and their	R1,R2	

		And Tendering	qualifications. • Essentials of a contract • Types of contracts, their advantages, dis-advantages and suitability, system of payment. • Single and two cover-bids • Tender, tender forms and documents, tender notice, submission of tender and deposit of earnest money, security deposit, retention money, maintenance period • Administrative approval, Technical sanction, Budget provision, Expenditure sanction. • Methods for carrying out works- contract method. • Preparation of Tender Document based on Common Schedule Rates (CSR) • Introduction to CSR and calculation of cost based on premium on CSR		

REFERENCE RESOURCES

- **R1-** Dutta, B.N., Estimating and Costing in Civil engineering, UBS Publishers Distributors Pvt. Ltd. New Delhi
- **R2-** Rangwala, S.C., Estimating and Costing, Charotar Publishing House PVT. LTD. ,Anand.

Saibal Thakur
Signature of Teacher
01/08/2025

Signature of H.O.D