

## Lesson Plan

Name of the Faculty: Gaurav kumar

Discipline: CIVIL ENGINEERING

Semester:5<sup>th</sup>

Subject: CONCRETE TECHNOLOGY (CE-311N)

Work Load (Lecture/Practical) per week (in hours): Lectures- , Practicals-

Week	Theory		Practical	
	Lecture day	Topic (including assignment/test)	Practical day	Topic
1 <sup>st</sup>	1 <sup>st</sup>	UNIT-I Introduction: Introduction of Concrete	1 <sup>st</sup>	1. To determine the standard consistency and initial and final setting time of cement using Vicat's apparatus
	2 <sup>nd</sup>	preparation of concrete, grades of concrete, advantages of concrete,		
	3 <sup>rd</sup>	concept of quality control.		
	4 <sup>th</sup>	Cement: Introduction of Cement		
2 <sup>nd</sup>	5 <sup>th</sup>	ingredient in cement	2 <sup>nd</sup>	2. To determine the Fineness of cement by Sieve analysis and Blaine's air permeability method.
	6 <sup>th</sup>	basic chemistry, types of cement, ordinary Portland cement		
	7 <sup>th</sup>	rapid hardening cement,		
	8 <sup>th</sup>	low heat cement, sulphate resistant cement,		
3 <sup>rd</sup>	9 <sup>th</sup>	Portland-pozzolona cement, high strength Portland cement, high alumina cement,	3 <sup>rd</sup>	3. To determine the (1) specific gravity of cement (2) Soundness of cement by Le Chatelier's apparatus
	10 <sup>th</sup>	waterproof cement, white Portland cement, hydrophobic cement,		
	11 <sup>th</sup>	colored Portland cement, Field and laboratory tests on cement. Pozzolanic materials		
	12 <sup>th</sup>	Fly ash, metakaoline, GGBS, iron slag, rise husk ash - its types, properties		
4 <sup>th</sup>	13 <sup>th</sup>	applications & limitations	4 <sup>th</sup>	3. To determine the (1) specific gravity of cement (2) Soundness of cement by Le Chatelier's apparatus
	14 <sup>th</sup>	Aggregates: Aggregates, classification of aggregates based on petrography		
	15 <sup>th</sup>	size, shape and textures, deleterious substances in aggregates,		
	16 <sup>th</sup>	bulking of fine aggregates, sieve analysis, grading of aggregates as per IS-383-1970		
5 <sup>th</sup>	17 <sup>th</sup>	fineness modulus, Maximum size of aggregate, Quality of mixing water,	5 <sup>th</sup>	4. To determine the Compressive strength of cement.

		curing water.		
	18 <sup>th</sup>	UNIT-II .Production of Concrete: Introduction		
	19 <sup>th</sup>	Design of mix by IS & ACI methods including batching of materials		
	20 <sup>th</sup>	mixing of concrete materials, transportation of concrete,		
6 <sup>th</sup>	21 <sup>st</sup>	compaction of concrete, ready mixed concrete, vibrators	6 <sup>th</sup>	5. To Determine the Fineness Modulus, Bulk Density, Water Absorption and Specific gravity of Fine Aggregates.
	22 <sup>nd</sup>	Internal vibrators, external vibrators, concrete curing and formwork removal.		
	23 <sup>rd</sup>	Properties of Concrete: Introduction, workability, factors influencing workability		
	24 <sup>th</sup>	measurement of workability, requirements of workability, properties of hardened concrete		
7 <sup>th</sup>	25 <sup>th</sup>	stress and strain characteristics of concrete, Young's modulus of concrete	7 <sup>th</sup>	6. To Determine the Fineness Modulus, Bulk Density, Water Absorption and Specific gravity of Coarse Aggregates
	26 <sup>th</sup>	creep and shrinkage of concrete		
	27 <sup>th</sup>	permeability of concrete, durability of concrete sulphate attack, fire-resistance,		
	28 <sup>th</sup>	thermal properties of concrete, construction joints, expansion and contraction joints.		
8 <sup>th</sup>	29 <sup>th</sup>	UNIT-III Non-Destructive Testing of Concrete	8 <sup>th</sup>	7. Mix Design of Concrete by IS methods.
	30 <sup>th</sup>	Significance of Non-Destructive Testing		
	31 <sup>st</sup>	Rebound Hammer		
	32 <sup>nd</sup>	Rebound Hammer		
9 <sup>th</sup>	33 <sup>rd</sup>	Ultrasonic pulse velocity techniques	9 <sup>th</sup>	8. Workability of cement concrete by (1) Slump test, (2) Compaction factor test, (3) Flow table test
	34 <sup>th</sup>	Ultrasonic pulse velocity techniques		
	35 <sup>th</sup>	Penetration techniques		
	36 <sup>th</sup>	Penetration techniques		
10 <sup>th</sup>	37 <sup>th</sup>	, pullout tests, vibration method	10 <sup>th</sup>	8. Workability of cement concrete by (1) Slump test, (2) Compaction factor test, (3) Flow table test
	38 <sup>th</sup>	, pullout tests, vibration method		
	39 <sup>th</sup>	radioactive techniques, Cover meter, core-tests.		
	40 <sup>th</sup>	radioactive techniques, Cover meter, core-tests.		
11 <sup>th</sup>	41 <sup>st</sup>	Deterioration of Concrete & its Prevention: Causes of concrete deterioration	11 <sup>th</sup>	9. To Determine the Compressive strength of concrete by (1) Cube test, (2) Cylinder test.

	<b>42<sup>nd</sup></b>	deterioration by water, surface weir, frost action, deterioration by chemical reactions,		
	<b>43<sup>rd</sup></b>	deterioration by water, surface weir, frost action, deterioration by chemical reactions,		
	<b>44<sup>th</sup></b>	sulphate attack, alkali-aggregate reaction		
<b>12<sup>th</sup></b>	<b>45<sup>th</sup></b>	, corrosion of embedded steel in concrete,	<b>12<sup>th</sup></b>	10. To Determine the Split Tensile and Flexural strength of Concrete.
	<b>46<sup>th</sup></b>	Prevention of deterioration of concrete.		
	<b>47<sup>th</sup></b>	UNIT-IV Repair Technology for Concrete Structures:		
	<b>48<sup>th</sup></b>	Symptoms and diagnosis of distress, evaluation of cracks		
<b>13<sup>th</sup></b>	<b>49<sup>th</sup></b>	repair of cracks, common types of repairs,	<b>13<sup>th</sup></b>	11. To Determine the Bond strength between steel bar and concrete by pull-out test.
	<b>50<sup>th</sup></b>	distress in fire damaged structures, underwater repairs		
	<b>51<sup>st</sup></b>	distress in fire damaged structures, underwater repairs		
	<b>52<sup>nd</sup></b>	Special Concrete: Light weight concrete, definition and its properties		
<b>14<sup>th</sup></b>	<b>53<sup>rd</sup></b>	Special Concrete: Light weight concrete, definition and its properties	<b>14<sup>th</sup></b>	12. To evaluate the Non-destructive testing of concrete by (1) Rebound hammer, (2) ultrasonic pulse velocity test.
	<b>54<sup>th</sup></b>	applications, high strength concrete, definitions, its properties and applications,		
	<b>55<sup>th</sup></b>	Mass Concrete, waste material based concrete, shotcrete, fiber reinforced concrete:		
	<b>56<sup>th</sup></b>	Fibres types and properties, ferrocement, polymer concrete composites, heavy weight concrete for radiation shielding.		
<b>15<sup>th</sup></b>	<b>57<sup>th</sup></b>	Prestressed Concrete: Introduction, basic concepts,	<b>15<sup>th</sup></b>	13. To Determine the Compressive strength of Brick and Tile as IS standard.
	<b>58<sup>th</sup></b>	classifications and types of prestressing, prestressing systems		
	<b>59<sup>th</sup></b>	properties of materials,		
	<b>60<sup>th</sup></b>	pre tensioned and post tensioned concrete elements.		