

## LESSON PLAN: CONCRETE TECHNOLOGY

<b>Discipline: CIVIL ENGINEERING</b>	Semester: 6TH	Name of the faculty:
Subject: CONCRETE TECHNOLOGY	No. of Days/Per Week class	No. of Weeks: 15
<b>Week</b>	<b>Class Day</b>	<b>1.0 Concrete as a construction material:</b>
1st	1st	1.1 Grades of concrete.
	2nd	1.2 Advantages and disadvantages of concrete
		<b>2.0 Cement:</b>
	3rd	2.1 Composition
	4th	2.2 Hydration of cement, water cement ratio
2nd	1st	2.3 Compressive strength
	2nd	2.4 Fineness of cement, setting time,
	3rd	2.5 Soundness, types of cement.
		<b>3.0 Aggregate:</b>
	4th	3.1 Classification and characteristics of aggregate
3rd	1st	3.2 Deleterious substances in aggregates
	2nd	3.3 Fineness modulus
	3rd	3.4 Grading of aggregate, I.S.383
	4th	3.5 QUESTION & ANSWER
		<b>4.0 Water:</b>
4th	1st	4.1 Quality of water
	2nd	4.2 Mixing and curing
		<b>5.0 Admixtures:</b>
	3rd	5.1 Important functions, classification of admixtures, I.S 9103
	4th	5.2 Accelerating admixtures
5th	1st	5.3 Retarding admixtures
	2nd	5.4 Water reducing admixtures,
	3rd	5.5 Air containing admixtures.
		<b>6.0 Properties of fresh concrete:</b>
	4th	6.1 Concept of fresh concrete, workability
6TH	1st	6.2 Slump test
	2nd	6.3 Compacting factor test, V-tee consistency test and flow test
	3rd	6.4 Requirement of workability, I.S.1199.
	4th	7.0 Properties of hardened concrete:
7TH	1st	7.1 Cube and cylinder compressive strengths, flexural strength of concrete.
	2nd	7.2 Flexural strength of concrete
	3rd	7.3 Stress-strain and elasticity
	4th	7.4 Phenomena of creep and shrinkage
8TH	1st	7.5 permeability, durability of concrete
	2nd	7.6 durability of concrete, sulphate, chloride and acid attack on concrete
	3rd	7.7 efflorescence.
	4th	7.8 ASSIGNMENT
		<b>8.0 Concrete mix Design</b>
9TH	1st	a) Introduction
	2nd	b) Data or input required for mix design.
	3rd	c) Nominal mix concrete & design mix concrete.
	4th	d) Basic consideration for concrete mix design, Methods of proportioning concrete mix – I.S Code method of mix design (I.S.10262)

		<b>9.0 Production of concrete:</b>
10TH	1st	9.1 Batching of materials, mixing of concrete materials
	2nd	9.2 Transportation, placing of concrete, compaction of concrete,
	3rd	9.3 Compaction methods, vibrators, curing ,when to start and time of curing
	4th	9.4 Formwork-requirements and types ,stripping of forms.
		<b>10.0 Inspection and Quality Control of Concrete</b>
11TH	1st	10.1 Quality control of Concrete as per I.S.456, Factors causing the variations in the quality of concrete, field quality control
		10.2 Sampling & acceptance criteria as per Clause 15&16 of IS:456.
	2nd	10.3 Mixing, Transporting, Placing & curing requirements of Concrete as per I.S.456.
	3rd	10.4 Inspection and Testing as per Clause 17 of IS:456.
	4th	10.5 Durability requirements of Concrete as per I.S:456.
		<b>11.0 Special Concrete</b>
12TH	1st	11.1 Introduction to ready mix concrete
	2nd	11.2 high performance concrete
	3rd	11.3 silica fume concrete, ,
	4th	11.4 shot-crete concrete or guniting
		<b>12.0 Deterioration of concrete and its prevention:</b>
13TH	1st	12.1 Types of deterioration
	2nd	12.2 prevention of concrete deterioration,
	3rd	12.3 corrosion of reinforcement, effects and prevention.
		<b>13.0 Repair technology for concrete structures:</b>
	4th	13.1 Symptom, cause and prevention and remedy of defects during construction
14TH	1st	13.2 cracking of concrete due to different reasons
	2nd	13.3 repair of cracks for different purposes
	3rd	13.4 selection of techniques, polymer based repairs
	4th	13.5 common types of repairs.

## LESSON PLAN :CONSTRUCTION MANAGEMENT

Discipline: Civil Engineering	Semester: 6th	Name of the Teaching Faculty:
Subject: CONSTRUCTION MANAGEMENT	No. of days/ per week class allotted: 5	No. of Weeks: 15
Week	Class Day	Theory/ Practical Topics
		<b>1.Introduction To Construction Management</b>
1st	1st	Aims and objectives of construction management.Functions of construction management.
	2nd	The construction team components-owner,engineer,architect,contractor-their functions and interrelationship and jurisdiction.
	3rd	Resources for construction management-men,machines,materials,money
		<b>2.Constructional Planning</b>
	4th	Importance of Construction Planning.Developing work breakdown structure for construction work
	5th	Construction Planning stages-Pre-tender stage, Post-tender stage.Construction scheduling by Bar charts-preparation of Bar Charts for simple construction works
2nd	1st	Preparation of schedules for labour materials,machinery, finance for small works.Limitation of Bar charts
	2nd	techniques, advantages and disadvantages of two techniques, network analysis, estimation of time and critical path, application of PERT and CPM techniques in sample construction works.
		<b>3.Materials and Stores Management</b>
	3rd	Classification of Stores-storage of stock.
	4th	Issue of materials-indent , invoice, bin card
	5th	Stores Accounting Procedure
3rd	1st	Inspection of stores, T&P account's register, procedure of write off
	2nd	Inspection of stores, T&P account's register, procedure of write off
	3rd	Inspection of stores, T&P account's register, procedure of write off
		<b>4.Construction Site Management</b>
	4th	Job Lay out-Objectives, Review plans, specifications, Lay out of equipments
	5th	Job Lay out-Objectives, Review plans, specifications, Lay out of equipments
4th	1st	Job Lay out-Objectives, Review plans, specifications, Lay out of equipments
	2nd	Factors influencing selection, design and layout of temporary facilities and services at construction site.
	3rd	Factors influencing selection, design and layout of temporary facilities and services at construction site.
	4th	Factors influencing selection, design and layout of temporary facilities and services at construction site.
	5th	Principles of storing material at site.
5th	1st	Principles of storing material at site.
	2nd	Principles of storing material at site.
	3rd	Location of equipment, organizing labour at site.
	4th	Location of equipment, organizing labour at site.
	5th	Location of equipment, organizing labour at site.
6th	1st	Job lay out for different construction sites.
	2nd	Job lay out for different construction sites.
	3rd	Job lay out for different construction sites.

		<b>5.Construction Organisation</b>
	4th	Introduction – Characteristics, Structure, importance
	5th	Organization types-line and staff, functions and their characteristics
7th	1st	Principles of organization- meaning and significance of terms- control, authority, responsibility, job & task.
	2nd	Leadership-necessity, styles of leadership, role of leader,Principles of effective supervision
	3rd	Human relations-relations with subordinates, peers, Supervisors, characteristics of group behavior, mob psychology, handling of grievances, absenteeism, labour welfare
	4th	Conflicts in organization-genesis of conflicts, types-intrapersonal, interpersonal, intergroup, resolving conflicts.
		<b>6.Construction Labour and Labour Management:</b>
	5th	Preparing Labour schedule
8th	1st	Essential steps for optimum labour output
	2nd	Labour characteristics
	3rd	Wages & their payment
	4th	Labour incentives
	5th	Motivation- Classification of motives, different approaches to motivation
9th	1st	Morale
	2nd	Relevant labour laws and case studies related to labour disputes
		<b>7.Equipment Management</b>
	3rd	Preparing the equipment schedule
	4th	Identification of different alternative equipment
	5th	Importance of Owning & operating costs in making decisions for hiring & purchase of equipment
10th	1st	Importance of Owning & operating costs in making decisions for hiring & purchase of equipment
	2nd	Inspection and testing of equipment
	3rd	Inspection and testing of equipment
	4th	Equipment maintenance and minor repairs
	5th	Equipment maintenance and minor repairs
		<b>8.Quality Control</b>
11th	1st	Concept of quality in construction
	2nd	Quality Standards- during construction
	3rd	Quality Standards- during construction
	4th	Quality Standards- during construction
	5th	Quality Standards- during construction
12th	1st	Quality Standards- after construction
	2nd	Quality Standards- after construction
	3rd	Quality Standards- after construction
	4th	Quality Standards- destructive method
	5th	Quality Standards- destructive method
13th	1st	Quality Standards- Non destructive method
	2nd	Quality Standards- Non destructive method

		<b>9.Monitoring Progress</b>
	3rd	Programme and progress of work
	4th	Programme and progress of work
	5th	Work study
14th	1st	Work study
	2nd	Work study
	3rd	Analysis and control of physical and financial progress corrective measures
	4th	Analysis and control of physical and financial progress corrective measures
		<b>10.Safety Management In Construction</b>
	5th	Importance of safety
15th	1st	causes and effects of accidents in construction works
	2nd	Safety measures in worksites for excavation, scaffolding
	3rd	Safety measures in worksites for formwork, fabrication and erection, demolition.
	4th	Development of safety consciousness
	5th	Safety legislation- Workman's compensation act, contract labour act.

9th	1st	5.3.1 Acquisition of Imagery using aerial and satellite platform 5.3.2 Control Survey
	2nd	5.3.3 Geometric Distortion in Imagery Application of Imagery and its support data Orientation and Triangulation
	3rd	Stereoscopic Measurement 19.9.1 X-parallax 19.2.2 Y-parallax
	4th	5.4 DTM/DEM Generation
	5th	5.5 Ortho Image Generation
		<b>MODERN SURVEYING METHODS :</b>
10th	1st	6.1 Principles, features and use of (i) Micro-optic theodolite, digital theodolite
	2nd	6.1 Principles, features and use of (i) Micro-optic theodolite, digital theodolite
	3rd	6.1 Principles, features and use of (i) Micro-optic theodolite, digital theodolite
	4th	6.1 Principles, features and use of (i) Micro-optic theodolite, digital theodolite
	5th	6.2 Working principles of a Total Station (Set up and use of total station to measure angles, distances of points under survey from total station and the co-ordinates (X,Y & Z or northing, easting, and elevation) of surveyed points relative to Total Station position using trigonometry and triangulation
11th	1st	6.2 Working principles of a Total Station (Set up and use of total station to measure angles, distances of points under survey from total station and the co-ordinates (X,Y & Z or northing, easting, and elevation) of surveyed points relative to Total Station position using trigonometry and triangulation
	2nd	6.2 Working principles of a Total Station (Set up and use of total station to measure angles, distances of points under survey from total station and the co-ordinates (X,Y & Z or northing, easting, and elevation) of surveyed points relative to Total Station position using trigonometry and triangulation
	3rd	the co-ordinates (X,Y & Z or northing, easting, and elevation) of surveyed points relative to Total Station position using trigonometry and triangulation
	4th	the co-ordinates (X,Y & Z or northing, easting, and elevation) of surveyed points relative to Total Station position using trigonometry and triangulation
	5th	the co-ordinates (X,Y & Z or northing, easting, and elevation) of surveyed points relative to Total Station position using trigonometry and triangulation
		<b>BASICS ON GPS &amp; DGPS AND ETS:</b>
12th	1st	7.1 GPS: - Global Positioning 7.1.1 Working Principle of GPS,GPS Signals, 7.1.2 Errors of GPS,Positioning Methods
	2nd	,GPS Signals, 7.1.2 Errors of GPS,Positioning Methods
	3rd	7.2 DGPS: - Differential Global Positioning System 7.2.1 Base Station Setup
	4th	7.2.2 Rover GPS Set up 7.2.3 Download, Post-Process and Export GPS data

	5th	7.2.4 Sequence to download GPS data from flashcards 7.2.5 Sequence to Post-Process GPS data
13th	1st	7.2.6 Sequence to export post process GPS data 7.2.7 Sequence to export GPS Time tags to file
	2nd	7.3 ETS: - Electronic Total Station 7.3.1 Distance Measurement
	3rd	7.3.2 Angle Measurement 7.3.3 Leveling
	4th	7.3.4 Determining position
	5th	7.3.5 Reference networks 7.3.6 Errors and Accuracy
		<b>BASICS OF GIS AND MAP PREPARATION USING GIS</b>
14th	1st	8.1 Components of GIS, Integration of Spatial and Attribute Information
	2nd	8.2 Three Views of Information System
	3rd	8.2.1 Database or Table View, Map View and Model View 8.3 Spatial Data Model
	4th	8.4 Attribute Data Management and Metadata Concept
	5th	8.5 Prepare data and adding to Arc Map.
15th	1st	8.6 Organizing data as layers.8.7 Editing the layers.
	2nd	8.8 Switching to Layout View.
	3rd	8.9 Change page orientation.
	4th	8.10 Removing Borders.
	5th	8.11 Adding and editing map information. 8.12 Finalize the map

# LESSON PLAN OF 6<sup>TH</sup> SEMESTER CIVIL ENGINEERING(2022-23)

Discipline :- CIVIL	Semester:- 6 <sup>TH</sup>	Name of the Teaching Faculty:
Subject:- Advanced Construction Techniques & Equipment	No of Days/per Week Class Allotted :-04	No of Weeks:- 20
Week	Class Day	Theory/ Practical Topics
1 <sup>st</sup>	1 <sup>st</sup>	<b>Advanced construction materials</b> 1.1 Fibers and Plastics- Types of fibers- Steel, Carbon, glass fibre
	2 <sup>nd</sup>	Use of fibers as construction material, properties of Fibers.
	3 <sup>rd</sup>	Types of plastics- PVC, RPVC, HDPE, FRP, GRP etc. Colored plastic sheets
	4 <sup>th</sup>	Use of plastic as construction material
2 <sup>nd</sup>	1 <sup>st</sup>	1.2 Artificial Timbers – Properties and uses of artificial timber
	2 <sup>nd</sup>	Types of artificial timber available in market
	3 <sup>rd</sup>	strength of artificial timber.
	4 <sup>th</sup>	1.3 Miscellaneous materials – Properties and uses of acoustics materials
3 <sup>rd</sup>	1 <sup>st</sup>	wall claddings, plaster boards, micro-silica
	2 <sup>nd</sup>	artificial sand, bonding agents, adhesives etc.
	3 <sup>rd</sup>	<b>Prefabrication</b> 2.1 Introduction, necessity and scope of prefabrication of buildings
	4 <sup>th</sup>	history of prefabrication, current uses of prefabrication
4 <sup>th</sup>	1 <sup>st</sup>	types of prefabricated systems
	2 <sup>nd</sup>	classification of prefabrication, advantages and disadvantages of prefabrication,
	3 <sup>rd</sup>	2.2 The theory and process of prefabrication
	4 <sup>th</sup>	design principle of prefabricated systems
5 <sup>th</sup>	1 <sup>st</sup>	types of prefabricated elements, modular coordination
	2 <sup>nd</sup>	2.3 Indian standard recommendation for modular planning.



	3 <sup>rd</sup>	<b>Earthquake Resistant Construction</b> 3.1 Building Configuration
	4 <sup>th</sup>	3.2 Lateral Load resisting structures
6 <sup>th</sup>	1 <sup>st</sup>	3.3 Building characteristics
	2 <sup>nd</sup>	3.4 Effect of structural irregularities-vertical irregularities, plan configuration problems
	3 <sup>rd</sup>	3.5 Safety consideration during additional construction and alteration of existing Buildings. 3.6 Additional strengthening measures in masonry building-corner reinforcement, lintel band, sill band, plinth band, roof band, gable band etc.
	4 <sup>th</sup>	4.1 Seismic retrofitting of reinforced concrete buildings :
7 <sup>th</sup>	1 <sup>st</sup>	<b>Name of the Teaching Faculty:</b>
	2 <sup>nd</sup>	No of Weeks:- <b>20</b>
	3 <sup>rd</sup>	Sources of weakness in RC frame building
	4 <sup>th</sup>	Sources of weakness in RC frame building
8 <sup>th</sup>	1 <sup>st</sup>	-Classification of retrofitting techniques
	2 <sup>nd</sup>	uses of retrofitting techniques
	3 <sup>rd</sup>	<b>Building Services</b> 5.1 Cold Water Distribution in high rise building, lay out of installation
	4 <sup>th</sup>	5.2 Hot water supply – General principles for central plants-layout
9 <sup>th</sup>	1 <sup>st</sup>	5.3 Sanitation –soil and waste water installation in high rise buildings
	2 <sup>nd</sup>	5.4 Electrical services – i) requirements in high rise buildings
	3 <sup>rd</sup>	ii) Layout of wiring - types of wiring iii) Fuses and their types
	4 <sup>th</sup>	iv)Earthing and their uses
10 <sup>th</sup>	1 <sup>st</sup>	5.5 Lighting – Requirement of lighting, Measurement of light intensity
	2 <sup>nd</sup>	5.6 Ventilation - Methods of ventilation (Natural and artificial Systems of ventilation)
	3 <sup>rd</sup>	5.6 Ventilation - Methods of ventilation (Natural and artificial Systems of ventilation)

	4 <sup>th</sup>	5.7 Mechanical Services- Lifts, Escalator
11 <sup>th</sup>	1 <sup>st</sup>	Elevators – types and uses.
	2 <sup>nd</sup>	<b>Construction and earth moving equipments –</b> 6.1 Planning of construction equipment
	3 <sup>rd</sup>	selection of construction equipments
	4 <sup>th</sup>	6.2 Study on earth moving equipments like drag line
12 <sup>th</sup>	1 <sup>st</sup>	tractor, bulldozer, Power shovel
	2 <sup>nd</sup>	6.3 Study and uses of compacting equipments like tamping rollers
	3 <sup>rd</sup>	Smooth wheel rollers
	4 <sup>th</sup>	Pneumatic tired rollers
13 <sup>th</sup>	1 <sup>st</sup>	vibrating compactors
	2 <sup>nd</sup>	<b>Soil reinforcing techniques</b> 7.1 Necessity of soil reinforcing
	3 <sup>rd</sup>	Necessity of soil reinforcing
	4 <sup>th</sup>	
14 <sup>th</sup>	1 <sup>st</sup>	geo-synthetics
	2 <sup>nd</sup>	7.3 Strengthening of embankments
	3 <sup>rd</sup>	Slope stabilization in cutting and by soil reinforcing techniques.
	4 <sup>th</sup>	Slope stabilization in embankments by soil reinforcing techniques.
15 <sup>th</sup>	1 <sup>st</sup>	PREVIOUS YEAR QUESTIONS DISCUSSION
	2 <sup>nd</sup>	PREVIOUS YEAR QUESTIONS DISCUSSION
	3 <sup>rd</sup>	DOUBT CLEARING CLASS
	4 <sup>th</sup>	DOUBT CLEARING CLASS
16 <sup>th</sup>	1 <sup>st</sup>	PREVIOUS YEAR QUESTIONS DISCUSSION
	2 <sup>nd</sup>	PREVIOUS YEAR QUESTIONS DISCUSSION
	3 <sup>rd</sup>	PREVIOUS YEAR QUESTIONS DISCUSSION
	4 <sup>th</sup>	PREVIOUS YEAR QUESTIONS DISCUSSION
17 <sup>th</sup>	1 <sup>st</sup>	PREVIOUS YEAR QUESTIONS DISCUSSION
	2 <sup>nd</sup>	PREVIOUS YEAR QUESTIONS DISCUSSION
	3 <sup>rd</sup>	PREVIOUS YEAR QUESTIONS DISCUSSION
	4 <sup>th</sup>	
18 <sup>th</sup>	1 <sup>st</sup>	DOUBT CLEARING CLASS
	2 <sup>nd</sup>	DOUBT CLEARING CLASS

	3 <sup>rd</sup>	DOUBT CLEARING CLASS
	4 <sup>th</sup>	DOUBT CLEARING CLASS
19 <sup>th</sup>	1 <sup>st</sup>	DOUBT CLEARING CLASS
	2 <sup>nd</sup>	DOUBT CLEARING CLASS
	3 <sup>rd</sup>	DOUBT CLEARING CLASS
	4 <sup>th</sup>	DOUBT CLEARING CLASS
20 <sup>th</sup>	1 <sup>st</sup>	DOUBT CLEARING CLASS
	2 <sup>nd</sup>	DOUBT CLEARING CLASS
	3 <sup>rd</sup>	DOUBT CLEARING CLASS
	4 <sup>th</sup>	