	SRI VIDYA COLLEGE OF **ENGINEERING & TECHNOLOGY** **COURSE PLAN**	Doc.Ref:SV**CE**02 Revision: 01 Date:

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR: 2018-19

Subject Code	**CE 6506**		**L**	**P**	**T**	**C**
Subject Title	Construction Techniques, Equipment and Practice		3	0	0	3
Year / Dept / Sem	III/CIVIL/VI	Regulation Year	2013			
Faculty Name / Desg / Dept	Mr.R.MANIKANDAN/AP/CIVIL					
Course Prerequisite	To make the student aware of the various constructions, techniques, practices and the equipment needed for different types of construction activities.					

CE6506 CONSTRUCTION TECHNIQUES, EQUIPMENT AND PRACTICE L T P C
3 0 0 3

OBJECTIVES:

The main objective of this course is to make the student aware of the various construction techniques, practices and the equipment needed for different types of construction activities. At the end of this course the student shall have a reasonable knowledge about the various construction procedures for sub to super structure and also the equipment needed for construction of various types of structures from foundation to super structure.

UNIT I CONCRETE TECHNOLOGY 9

Cements – Grade of cements - concrete chemicals and Applications – Grade of concrete - manufacturing of concrete – Batching – mixing – transporting – placing – compaction of concrete – curing and finishing - Testing of fresh and hardened concrete – quality of concrete – Extreme Weather Concreting - Ready Mix Concrete - Non-destructive testing.

UNIT II CONSTRUCTION PRACTICES 9

Specifications, details and sequence of activities and construction co-ordination – Site Clearance – Marking – Earthwork - masonry – stone masonry – Bond in masonry - concrete hollow block masonry – flooring – damp proof courses – construction joints – movement and expansion joints – pre cast pavements – Building foundations – basements – temporary shed – centering and shuttering – slip forms – scaffoldings – de-shuttering forms – Fabrication and erection of steel trusses – frames – braced domes – laying brick –– weather and water proof – roof finishes – acoustic and fire protection.

UNIT III SUB STRUCTURE CONSTRUCTION 9

Techniques of Box jacking – Pipe Jacking -under water construction of diaphragm walls and basement-Tunneling techniques – Piling techniques - well and caisson - sinking cofferdam - cable anchoring and grouting-driving diaphragm walls, sheet piles - shoring for deep cutting - well points-Dewatering and stand by Plant equipment for underground open excavation.

UNIT IV SUPER STRUCTURE CONSTRUCTION 9

Launching girders, bridge decks, off shore platforms – special forms for shells - techniques for heavy decks – in-situ pre-stressing in high rise structures, Material handling - erecting light weight components on tall structures - Support structure for heavy Equipment and conveyors -Erection of articulated structures, braced domes and space decks.

UNIT V CONSTRUCTION EQUIPMENT **9**

Selection of equipment for earth work - earth moving operations - types of earthwork equipment - tractors, motor graders, scrapers, front end waders, earth movers – Equipment for foundation and pile driving. Equipment for compaction, batching and mixing and concreting - Equipment for material handling and erection of structures - Equipment for dredging, trenching, tunneling,

TOTAL: 45 PERIODS

TEXTBOOKS :

1. Arora S.P. and Bindra S.P., "Building Construction, Planning Techniques and Method of Construction", Dhanpat Rai and Sons, 1997.
2. Varghese, P.C. "Building construction", Prentice Hall of India Pvt. Ltd, New Delhi, 2007.
3. Shetty, M.S, "Concrete Technology, Theory and Practice", S. Chand and Company Ltd, New Delhi, 2008.
4. Kannan.V, "construction techniques, equipment and practice" ,sruthi publishers,Chennai,2016.

REFERENCES:

1. Jha J and Sinha S.K., "Construction and Foundation Engineering", Khanna Publishers, 1999.
2. Sharma S.C. "Construction Equipment and Management", Khanna Publishers New Delhi, 2002.
3. Deodhar, S.V. "Construction Equipment and Job Planning", Khanna Publishers, New Delhi, 2012.
4. Dr. Mahesh Varma, "Construction Equipment and its Planning and Application", Metropolitan Book Company, New Delhi, 1983.
5. Gambhir, M.L, "Concrete Technology", Tata McGraw Hill Publishing Company Ltd, New Delhi

Course Objectives (CO)	Students will be able to • To make the students to gain the knowledge on concrete technology.This course imparts the student's knowledge of various construction practices.. • To obtain the knowledge about various techniques of sub structure and super structure, various innovative techniques in construction of bridges and tall structures.
Expected Course Outcome (ECO)	Students completing the course will have understanding of different construction techniques, practices and equipments. They will be able to plan the requirements for substructure and superstructure a construction.

Mapping of CO & PO(Specify the PO's) - ***(Fill the col.s with the legend given below)***

Programme Outcomes of Civil Engineering

a. Graduates of Civil Engineering program will be able to apply the fundamental knowledge of mathematics, science and engineering to solve problems pertaining to Civil Engineering.
b. Graduates of Civil Engineering program will be able to identify, analyze, formulate, and solve civil Engineering problems in accordance with Indian Standard codes of practice.
c. Graduates of Civil Engineering program will be able to design a system component, or process to meet desired needs within realistic constraint such as economic, environmental, social, political, ethical, health safety, manufacturability, and sustainability.
d. Graduates of Civil Engineering program will able be to design and conduct experiments, as well as to analyze and interpret data.
e. Graduates of Civil Engineering will be able to use the techniques, skills, and modern civil engineering tools, necessary for engineering practice.
f. Graduates of Civil Engineering program will be able to incorporate specific contemporary issues into the identification, formulation, and solution of specific civil engineering problems.
g. Graduates of Civil Engineering program will be able to work on the basis of broad education necessary to

understand the impact of engineering solutions in a global, economic, environmental, and societal context.

h. Graduates of Civil Engineering program will be able to understand the role of Civil Engineers and ethical responsibility.
i. Graduates of Civil Engineering program will be able to function on multidisciplinary teams.
j. Graduates of Civil Engineering program will be able to deliver effective verbal, written, and graphical communications.
k. Graduates of Civil Engineering program will be able to recognize the need for, and an ability to engage in life-long learning
l. Graduates of Civil Engineering program will be able to perform economic analysis, quality checks, time/labour management and cost estimates related to design, construction, operations and maintenance of systems in the civil technical specialties.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	2	3	-	1	-	-	-	-	1
CO2	-	-	-	-	-	-	-	-	-	1	-	-
CO3	-	-	3	-	-	3	-	2	-	1	-	-
CO4	-	-	-	-	-	-	-	-	1	-	3	1
CO5	-	-	-	-	-	1	-	-	-	1	3	-
CO6	-	-	-	-	-	-	-	1	-	-	3	-

Bridging the Curriculum Gap (Additional Topics beyond syllabus / Seminars / Assignments)	BCG1: MODERN CONSTRUCTION MATERIALS USED IN BUILDING CONSTRUCTION BCG2: MODERN RAILWAY CONSTRUCTION TECHNIQUES AND MAINTENANCE BCG3: ABOUT METRO,MONO AND UNDER GROUND RAIL CONSTRUCTION
Related Website URLs	www.slideshare.net/.../cv213-s5-transportation-**engineering** www.universityquestions.in/.../ce2303-railways-airports-and-harbour https://www.vidyarthiplus.com/vp/thread
Related Video Course Materials (min. 4 no.s)	http://freevideolectures.com/Course/2673/Transportation-Engineering-II http://www.nptel.ac.in/courses/105107123/ https://www.youtube.com/watch?v=bvHAUpJbN0g–

S.No	Topic Name	Book	Page no	Mode of delivery	No of hrs	Cumulative hrs
UNIT I CONCRETE TECHNOLOGY **9** Cements – Grade of cements - concrete chemicals and Applications – Grade of concrete - manufacturing of concrete – Batching – mixing – transporting – placing – compaction of concrete – curing and finishing - Testing of fresh and hardened concrete – quality of concrete – Extreme Weather Concreting - Ready Mix Concrete - Non-destructive testing.						
1	Cements – Grade of cements	T4,R6	T4/2-5, R6/1.1-1.5	Class room teaching, ppt	1	1
2	Concrete chemicals and Applications	R5,R6	R5/79-123,R6/1.12-1.16	Class room teaching,	1	2
3	Grade of concrete - manufacturing of concrete	R5,R6	R5/271,R6/1.26	Class room teaching, ppt	1	3

4	Batching – mixing – transporting -placing – compaction of concrete – curing and finishing	R5,R6	R5/271-311,R6/1.27-1.32	ppt	1	4
6	Testing of fresh and hardened concrete	R5,R6	R5/324-327,R6/1.32-1.41	ppt	1	5
7	Quality of concrete	R5,R6	R5/177-195,R6/1.42	Class room teaching, ppt	1	6
8	Extreme Weather Concreting	R5,R6		Class room teaching, ppt	1	7
9	Ready Mix Concrete	R5,R6		ppt	1	8
10	Non-destructive testing	R5,R6		Class room teaching, ppt	1	9

UNIT II CONSTRUCTION PRACTICES 9

Specifications, details and sequence of activities and construction co-ordination – Site Clearance – Marking – Earthwork - masonry – stone masonry – Bond in masonry - concrete hollow block masonry – flooring – damp proof courses – construction joints – movement and expansion joints – pre cast pavements – Building foundations – basements – temporary shed – centering and shuttering – slip forms – scaffoldings – de-shuttering forms – Fabrication and erection of steel trusses – frames – braced domes – laying brick –– weather and water proof – roof finishes – acoustic and fire protection.

1	Specifications, details and sequence of activities and construction co-ordination	T3,R6	T3/1-12, R6/2.1-2.3	Class room teaching,	1	10
2	Site Clearance – Marking – Earthwork	T3,R6	T3/12-23, R6/2.4-2.8	Class room teaching,	1	11
3	Masonry – stone masonry – Bond in masonry - concrete hollow block masonry	T3,R6	T3/66-75,R6,4.1-4.22	Class room teaching	1	12
4	Flooring – damp proof courses	T3,R6	T3/59-65,R6/4.42-4.50	Class room teaching,ppt	1	13
5	Construction joints – movement and expansion joints – pre cast pavements	T2,R6	T2/24.37-34.40,R6/4.54-4.58	Class room teaching,ppt	1	14
6	Building foundations – basements – temporary shed	T2,R6	T2/23.45-23.48&7.1-7.37, R6/4.78-4.80	Class room teaching,ppt, Video presentation	1	15
7	Centering and shuttering – slip forms – scaffoldings – de-shuttering forms	T2,R6	T2/24.1-24.8,R6/2.6-2.11	Class room teaching, ppt,	1	16
8	Fabrication and erection of steel trusses	T3,R6	T3/392,R6/4.58-4.65	Class room teaching, ppt,	1	17

	– frames – braced domes – laying brick					
9	Weather and water proof – roof finishes	T3,R6	T3/278-290,R6/4.50-4.54	Class room teaching, ppt,	0.5	17.5
10	Acoustic and fire protection.	T2,R6	T2/20.1-20.17&10.16-10.24,R6/4.65-4.77	Class room teaching, ppt,	0.5	18
UNIT III SUB STRUCTURE CONSTRUCTION 9 Techniques of Box jacking – Pipe Jacking -under water construction of diaphragm walls and basement-Tunneling techniques – Piling techniques - well and caisson - sinking cofferdam - cable anchoring and grouting-driving diaphragm walls, sheet piles - shoring for deep cutting - well points-Dewatering and stand by Plant equipment for underground open excavation.						
1	Techniques of Box jacking	R6	R6/6.1-6.8	Class room teaching,ppt	1	19
2	Under water construction of diaphragm walls and basement	R6	R6/6.18-6.24	Class room teaching,ppt Video presentation	1	20
3	Tunneling techniques-Piling techniques	R6	R6/9.1-9.8	Class room teaching, ppt , video presentation	1	21
4	Well and caisson - sinking cofferdam	R6	R6/9.9-9.12	Class room teaching,ppt	1	22
5	Cable anchoring and grouting	R6	R6/9.13-9.16	Class room teaching,ppt	1	23
6	Driving diaphragm walls, sheet piles	R6	R6/8.1-8.15	Class room teaching,ppt	1	24
7	Shoring for deep cutting - well points	R6	R6/8.16-8.24	Class room teaching,ppt	1	25
8	Dewatering and stand by Plant equipment for underground open excavation	R6	R6/3.1-3.21	Class room teaching,ppt	2	27
UNIT IV SUPER STRUCTURE CONSTRUCTION 9 Launching girders, bridge decks, off shore platforms – special forms for shells - techniques for heavy decks – in-situ pre-stressing in high rise structures, Material handling - erecting light weight components on tall structures - Support structure for heavy Equipment and conveyors -Erection of articulated structures, braced domes and space decks.						
1	Launching girders, bridge decks, off shore platforms	R7	R6/7.12-7.15	Class room teaching,ppt	1	28

2	Special forms for shells - techniques for heavy decks	R7	R6/7.18-7.21	Class room teaching,	2	30
3	In-situ pre-stressing in high rise structures	R7	R6/7.30-7.34	Class room teaching,	1	31
4	Material handling - erecting light weight components on tall structures	R7	R6/7.42-7.43	Class room teaching,ppt	1	32
5	Support structure for heavy Equipment and conveyors	R7	R6/7.46-7.48		2	34
6	Erection of articulated structures, braced domes and space decks	R7	R6/7.40-7.42	Class room teaching,ppt	2	36

UNIT V CONSTRUCTION EQUIPMENT 9

Selection of equipment for earth work - earth moving operations - types of earthwork equipment - tractors, motor graders, scrapers, front end waders, earth movers – Equipment for foundation and pile driving. Equipment for compaction, batching and mixing and concreting - Equipment for material handling and erection of structures - Equipment for dredging, trenching, tunneling,

1	Selection of equipment for earth work	T4	T4/6.1-6.3	Class room teaching,ppt	1	37
2	Earth moving operations - types of earthwork equipment	T4	T4/6.3-6.14	Class room teaching,ppt	1	38
3	Tractors, motor graders, scrapers, front end waders, earth movers	T4	T4/6.4-6.14	Class room teaching,ppt	2	40
4	Equipment for foundation and pile driving	T4	T4/6.16-6.17	Class room teaching,ppt	1	41
5	Equipment for compaction, batching and mixing and concreting	T4	T4/6.192-6.23	Class room teaching,ppt ,	2	43
6	Equipment for material handling and erection of structures	T4	T4/6.262-6.32	Class room teaching,ppt	1	44
7	Equipment for dredging, trenching, tunneling	T4	T4/6.4-6.47	Class room teaching,ppt	1	45

	Prepared by	***Approved by***
Signature		
Name	Mr.R.Manikandan	Mr.P.Suresh Kumar
Designation	Assistant Professor Civil Engineering	HOD/Civil Engineering
Signed date		

LEGEND:

METHODOLOGY TO MAP OBJECTIVE WITH OUTCOME

Course outcomes are achieved through

- **a.** Suitable Analogies.
- **b.** Class room teaching.
- **c.** Assignments.
- **d.** Tutorials
- **e.** Weekly, monthly and model exams.
- **f.** Brain storming.
- **g.** Group discussion and role play.
- **h.** Seminars