



R. K. Institute of Engineering and Technology
Approved by AICTE, New Delhi and Affiliated to SCTE&VT, Odisha

CIVIL ENGINEERING

SEMESTER : 5th

FROM :01/07/2026 TO :05/11/2026

NAME OF THE FACULTY : Er. SUDHESHA PANDA

SUBJECT : ADVANCED CONSTRUCTION TECHNOLOGY

TOTAL CLASS AVAILABLE IN SEMESTER: 45 nos

NO. OF PERIODS : 03/ WEEK

Class No.	Unit	Topic / Sub-topic	Teaching Method	Learning Outcome
1	I	Introduction to Advanced Construction Materials	Lecture	Understand the need for advanced construction materials
2	I	Steel, Polypropylene, Carbon & Glass Fibres – Properties and Applications	Lecture + Samples	Compare different reinforcing fibres
3	I	Plastics – PVC, RPVC, HDPE, FRP & GRP: Properties and Uses	Lecture	Identify engineering plastics used in construction
4	I	Acoustic Materials, Wall Claddings & Plaster Boards	Lecture + Demonstration	Explain finishing and insulation materials
5	I	Micro-silica, Waterproofing Materials & Adhesives	Lecture	Understand specialty construction materials
6	I	Use of Industrial By-products and Waste Materials in Construction	Lecture + Case Study	Explain sustainable construction practices
7	I	Revision & Unit Test	Practice/Test	Assess Unit-I
8	II	Ready Mix Concrete (RMC) – Necessity, Advantages & Applications	Lecture	Understand RMC technology
9	II	RMC Plant – Components, Equipment & Production Process	Lecture + Video Demonstration	Identify RMC plant equipment
10	II	Transit Mixers & Conveying of Ready Mix Concrete	Lecture	Explain transportation of concrete
11	II	Concrete Vibrators – Internal, Needle, Surface, Platform & Form Vibrators	Lecture + Demonstration	Select suitable vibration equipment
12	II	Underwater Concreting – Tremie Method	Lecture + Diagram	Explain Tremie concreting



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13	II	Underwater Concreting – Drop Bucket Method	Lecture	Compare underwater concreting methods
14	II	Concrete Properties for Underwater Concreting (Workability & W/C Ratio)	Lecture	Understand underwater concrete requirements
15	II	Roller Compacted Concrete (RCC) – Procedure & Applications	Lecture	Explain roller compacted concrete
16	II	Self-Compacting Concrete (SCC)	Lecture	Understand SCC characteristics
17	II	Steel Fibre Reinforced Concrete, Foam Concrete & Shotcreting	Lecture + Video	Compare special concretes
18	II	Revision & Unit Test	Practice/Test	Assess Unit-II
19	III	Construction of Bridges – Foundation Equipment & Machinery	Lecture	Identify bridge construction equipment
20	III	Bridge Superstructure Construction Equipment	Lecture + Case Study	Explain superstructure construction methods
21	III	Construction of Multi-storeyed Buildings – Equipment & Machinery	Lecture	Understand high-rise construction techniques
22	III	Concrete Pumping, Construction Lifts & Belt Conveyors	Lecture + Demonstration	Explain material handling systems
23	III	Prefabricated Construction – Concepts & Methods	Lecture	Understand prefabrication
24	III	Plant Fabrication & Site Fabrication	Lecture	Compare fabrication methods
25	III	Prefabricated Building Elements & Erection Equipment	Lecture + Demonstration	Identify prefabricated components
26	III	Geosynthetics for Soil Reinforcement & Embankment Strengthening	Lecture	Explain soil reinforcement techniques
27	III	Revision & Unit Test	Practice/Test	Assess Unit-III
28	IV	Hoisting Equipment – Derrick Pole, Gin Pole & Cranes	Lecture	Classify hoisting equipment
29	IV	Tower Crane, Gantry Crane, Crawler Crane & Truck-mounted Crane	Lecture + Video	Select suitable cranes
30	IV	Winches, Elevators, Ladders & Mast Cranes	Lecture	Explain auxiliary lifting equipment



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31	IV	Belt Conveyors - Types, Components & Working	Lecture	Understand conveying systems
32	IV	Dumpers, Tractors & Trucks - Capacity and Applications	Lecture	Select transportation equipment
33	IV	Revision & Unit Test	Practice/Test	Assess Unit-IV
34	V	Excavation Equipment - Bulldozers, Scrapers & Graders	Lecture	Identify excavation machinery
35	V	Clamshell, Trenching Equipment, TBM, Belt Loaders, Power Shovels, JCB & Draglines	Lecture + Demonstration	Explain earthmoving equipment
36	V	Compaction Equipment - Rollers & Rammers	Lecture	Compare compaction equipment
37	V	Pile Driving Equipment & Pile Hammers	Lecture	Understand foundation equipment
38	V	Hot Mix Plant, Bitumen Paver & Grouting Equipment	Lecture	Explain road construction equipment
39	V	Guniting Equipment, Floor Polishing & Cutting Machines	Lecture	Identify finishing equipment
40	V	Drilling Patterns for Blasting & Bentonite Slurry	Lecture	Explain drilling techniques
41	V	Explosives for Blasting - Dynamite & Blasting Procedure	Lecture	Understand safe blasting operations
42	V	Selection of Construction Equipment - Factors & Case Studies	Discussion	Select appropriate equipment for projects
43	V	Comprehensive Revision & Equipment Identification Practice	Practice	Reinforce machinery concepts
44	V	Model Test & Doubt Clearing	Test/Discussion	Assess learning outcomes
45	V	Final Internal Assessment & Course Wrap-up	Test/Discussion	Complete course assessment



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Sign of Faculty
S. Panda

Sign of HOD
[Signature]
R. K. Institute of Engg. & Tech.
Kantapada, Niall, Cuttack

Sign of Principal
[Signature]
R. K. INSTITUTE OF ENGG & TECH
KANTAPADA, NIALI, CUTTACK