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Advance Construction Technology — Complete Syllabus (Program Elective-02, Option B)

BTEUP Diploma in Civil Engineering • 6th Semester • Session 2026-27

Subject 6.1 (Program Elective-02, Option B) • Total 100 Marks • 4 Credits • L 3 - T 1 •

Choose this OR Construction Management

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
6.1	Program Elective-02: Advance Construction Technology	Theory	3 - 0	4	Theory 40	Theory 60 (3 hrs)	100
Advance Construction Technology Total				4	40	60	100

What This Subject Aims To Do

To gain knowledge on different materials in advanced construction, know different methods in concreting, know the relevance of advanced construction methods for a particular site condition, and identify the requisite hoisting and conveying machinery for the given situation.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Advanced Construction Materials	9	15%
2	Advanced Concreting Methods and Equipments	12	20%

3	Advanced Technology in Constructions	15	25%
4	Hoisting and Conveying Equipments	10	20%
5	Miscellaneous Machineries and Equipments	10	20%

Unit 1 — Advanced Construction Materials (9 Periods, 15%)

Topics: Fibres: use and properties of steel, polypropylene, carbon and glass fibres; plastics: use and properties of PVC, RPVC, HDPE, FRP, GRP; miscellaneous materials: properties and uses of acoustics materials, wall claddings, plaster boards, micro-silica, waterproofing materials, adhesives; use of waste products and industrial by-products in bricks, blocks, concrete and mortar.

Unit 2 — Advanced Concreting Methods and Equipments (12 Periods, 20%)

Topics: Ready mix concrete: necessity and use of ready mix concrete; products and equipments for ready mix concrete plant; conveying of ready mix concrete, transit mixers; vibrators for concrete consolidation: internal, needle, surface, platform and form vibrators; underwater concreting: procedure and equipments required for Tremie method, drop bucket method; properties, workability and water cement ratio of the concrete; special concrete: procedure and uses of special concretes: roller compacted concrete, self-compacting concrete (SCC), steel fibre reinforced concrete, foam concrete, shotcreting.

Unit 3 — Advanced Technology in Constructions (15 Periods, 25%)

Topics: Construction of bridges, flyovers and tunnels: equipments and machineries required for foundation and super structure i.e. boom placer, hydraulic rig, slipform etc.; construction of multi-storeyed building: equipments and machinery required for construction of multi-storeyed building such as use of lifts, belt conveyers, pumping of concrete; prefabricated construction: methods of prefabrication, plant fabrication and site fabrication, all prefabricated building elements such as wall panels, slab panels, beams, columns, door and window frames etc.; equipments and machineries used for placing and jointing of prefabricated elements; strengthening of embankments by soil reinforcing techniques using geo-synthetics.

Unit 4 — Hoisting and Conveying Equipments (10 Periods, 20%)

Topics: Hoisting equipments: principles and working of derrick-pole, gin pole, crane, power driven scotch derrick crane, hand operated crane, locomotive crane, tower crane, lattice girder, winches, elevators, ladders, crawler cranes, truck mounted cranes, gantry cranes, mast cranes; conveying equipments: working of belt conveyers, types of belts and conveying mechanism; capacity and use of dumpers, tractors and trucks.

Unit 5 — Miscellaneous Machineries and Equipments (10 Periods, 20%)

Topics: Excavation equipments: use, working and output of following machinery — bull dozers, scrapers, graders, clam shell, trenching equipment, tunnel boring machine, wheel mounted belt loaders, power shovels, JCB, and drag lines; compacting equipments: output of different types of rollers such as plain rollers, ship footed rollers, vibratory, pneumatic rollers, rammers; miscellaneous equipments: working and selection of equipments: pile driving equipments, pile hammers, hot mix bitumen plant, bitumen paver, grouting equipment, guniting equipments, floor polishing and cutting machine; selection of drilling pattern for blasting, bentonite/mud slurry in drilling, explosives for blasting, dynamite, process of using explosives.

Reference Books (as listed in the syllabus)

- Sharma S C and Deodhar S V, Construction Engineering and Management, Khanna Book Publishing, New Delhi.
- Chudly, R., Construction Technology Vol. I to II, ELBS-Longman Group.
- Peurifoy, R. L., Construction Planning Equipment and Methods, McGraw Hill Co. Ltd., New York.
- Seetharaman, S., Construction Engineering and Management, Umesh Publication, New Delhi.
- Sengupta, B. and Guha., Construction Management and Planning, McGraw Hill Education, New Delhi.
- Smith, R. C., Materials of Construction, McGraw Hill Co. Ltd.
- Satyanarayana, R, Saxena, S. C., Construction Planning and Equipment, Standard Publication, New Delhi.
- Rangawala, S. C., Construction of Structures and Management of works, Charotar Publication, Anand.
- Ghose, D. N., Materials of Construction, McGraw Hill Publishing Co, New Delhi.

follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text.
Please confirm with your own polytechnic for any local changes.

