

Kadi Sarva Vishwavidyalaya, Gandhinagar
M.E. (Civil Infrastructure Engineering) Semester: II
(w.e.f. Academic Year 2017-18)

Subject Name: Modern Infrastructure Construction

Subject code: MECV203-N

A. Learning objectives:

The objective of this course is

- To have an overall knowledge of the Construction of Underground Corridor for Metro Rail, Modern Construction Materials, Formwork & Scaffolding.
- Introduction to Modern Construction Equipments, Site Safety Management, Precasting & Prestress concreting, Highway Construction.

B. Teaching Scheme (Credits and Hours)

Teaching Scheme				Credit Scheme			Evaluation Scheme				
Lect (Hrs)	Tu (Hrs)	Prac. (Hrs)	Total (Hrs)	Theory	Pra/TW	Total	UE	IE	CIA	Prac/Viva	Total
03	00	00	03	03	00	03	70	30	20	00	120

C. Detailed Syllabus

- 1 Formwork & Scaffolding:** Modular Total formwork system; Aluminum formwork; Slip form, Jump formwork Deep foundations and Enabling Structures , Cassions Wells, Piles, Rafts; Cofferdams; Strutting; Tunneling: By tunnel boring machine (IBM); By New Austrian tunneling method (NATM); Tunnel form technology.
- 2 Sustainable Smart Buildings:** Basics of sustainability, Benefits of Sustainable Building, Sustainable Building Design, Site Location and Selection, Reducing Material Impacts, Increasing Energy Efficiency and Comfort, Building Systems that Reduce Material and Energy Impacts: Sustainable Foundations, Sustainable Exterior and Interior Finish Materials, Sustainable Building Checklist
- 3 Construction of Underground Corridor for Metro Rail:** Soldier piles and king piles; Timber lagging; Deep excavation; Diaphragm walls; Strutting; Construction decks; Rock excavation; Shotcreting, Rock bolting; Rock anchors; Sub floor drainage; Waterproofing; Dewatering; Traffic diversion; Utility diversion; Construction of RCC single & twin boxes; Tunneling by TBM; Tunneling by NATM.
- 4 Modern Construction Equipments:** Selection of construction equipments; Equipment owning & operating costs; Compacting & stabilizing equipments, Hydraulic rigs; Concrete pumps; Compressors etc.
- 5 Site Safety Management:** Personal protective equipments; Work place structural integrity; Safe working of cranes and other construction equipments.

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D. Lesson Planning:

Unit No	Topics	Hours	Weightage (%)
1.	Formwork & Scaffolding	10	22
2.	Sustainable Smart Buildings	10	22
3.	Construction of Underground Corridor for Metro	10	22
4.	Modern Construction Equipments	10	22
5.	Site Safety Management	05	12
Total		45	100

E. Instructional Method and Pedagogy (Continuous Internal Assessment (CIA) Scheme)

- Attendance is compulsory in lectures which carries 05 Marks.
- At regular intervals assignments is given to all students which carries 10 marks. Evaluation of these assignments will be observed under Daily Homework Daily Assessment (DHDA) System.
- One internal exam of 30 marks is conducted as a part of internal theory evaluation.

F. Students Learning Outcomes:

- At the end of the course
- The students will gain an experience in the implementation Modern Construction Materials, Formwork & Scaffolding.
- The students will get a diverse knowledge Modern Construction Equipments, Site Safety Management.
- The Students will learn to understand the theoretical and practical aspect of Precasting & Prestress concreting, Highway Construction.

G. Text Books & Reference Books:

1. Brain Culshaw, "Smart Structure and Materials", Artech House - Borton. London1996
2. Peurifoy RL (2006) Construction Planning Equipments and Methods, 3rd Edition, McGraw Hill Limited Kogakusha.
3. Kaushik SK, Asawa GL & Ahuja AK (1998) Civil Engineering Practices Volume-III, New Age International Publishers
4. CE & R (1998) Development in Concreting Technology in India – A Compilation of Reprints from CE&R (1991-97), Civil Engineering & Construction Review New Delhi
5. Dewar JD and R Anderson (2008) Manual of Ready Concrete, Blackie Publishers Glasgow/ London.
6. Kumar (2007) Building Construction, Standard Publishers Delhi.