Semester – V

Subject Name: Construction Quality Control and Monitoring

Subject Code: 09CI1503

Diploma Branches in which this subject is offered: Civil Engineering

Objective:

Objectives of introducing this subject at third year level in the civil engineering branch is to exhibit the desired quality standards which are acceptable by National Building code and International organization for standardization.

Credits Earned: 2

Course Outcomes:

On the completion of the course student will be able to:

- Application of quality control in construction work.
- Analysis quality and check the quality of construction.
- Identify the variations in quality of civil works.
- Use various standard codes in civil construction works.
- Design energy efficient buildings.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
0	0	4	2	00	30	20	25	25	100

Contents:

Unit	Topics	Contact hours	Weightage (%)
1	**Total Quality Management (TQM) in Construction.** • Conceptualization of quality control and monitoring, Quality management. • Aims and objective of quality management. • Evolution and design concept of quality management. • Observing, calibration, testing, and recording of data and information.	8	16
2	**Construction Quality Control Inspection Program.** • Duties and responsibilities of quality control engineer. • Qualification of staff in organization. • Checklists for o Quality of Materials o Masonry o Plastering o Concrete construction o Batching o Mixing o Transporting, Placing, Compaction, Finishing and Curing o Reinforcement Work o Formwork o Timber o Steel construction o Doors & windows o Plumbing & drainage	14	25
3	**Statistical Quality Control & Monitoring** • Statistical Quality Control. • Quality Measurement: Attributes and Variables. • Statistical Process Control (SPC) Methods. • Control Charts for Attributes: P-Charts – Proportion, Defective C-Charts - Number of Defects Per Unit. • Control Charts for Variables. • Other Types of Attribute-Sampling Plans. • Acceptance Sampling.	14	25

4	**Quality Standards** • Quality standards in construction related to Building materials and other inputs for construction processes. • Quality standards for Construction outputs, products and services. • Indian Standard Code (a) Methods of referring it (b) Use of IS for quality references. • National Building code (NBC 2005) (a) Why to refer & How to refer (b) Methods of referring it & application. • Study of International Organization for Standardization (ISO) • ISO-9000, ISO14000 & certification procedures.	12	20
5	**Sustainable Built Environment Green Building Introduction on advance surveying equipment.** • Green building. • Definition – Green Building, Green Construction, Sustainable building. • 2q Goals of Green building. • Advantages and disadvantages. • Strategies. • Certification Agencies – GRIHA, LEED (Highlights & Criteria). • Life cycle assessment (LCA). • Structural efficiency. • Energy efficiency. • Water efficiency. • Materials efficiency. • Indoor environmental quality enhancement. • Operations and maintenance optimization. • Waste reduction.	8	14

Suggested List of Presentation/Demonstration/Experiments & Calculations:

Sr. No.	Unit No.	Name of Topics	Hours
1.	1.	Introduction to total quality management	4
2.		Maintaining record of data and documentation	4
3.	2.	Duties and responsibilities of quality control engineer	6
4.		Prepare checklist for various component	8
5.	3.	Preparing presentation and chart for real structure on quality Measurement: Attributes and Variables.	6
6.		Preparing Sampling chart for testing	4
7.		Preparing and presenting acceptance sampling report.	4
8.	4.	Preparing presentation on quality standards in construction related to Building materials using Indian Standard Code, National Building code, Study of International Organization for Standardization	12
9.	5.	Preparing and presenting green building concept	4
10.		Visit to green building	4
Total			**56**

Instructional Method:

a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory.
c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
d. Students will use supplementary resources such as online videos, videos, e-courses, Virtual Laboratory.

References:

Sr. No.	Title of Book	Author	Publisher
1	Total Quality Management	G. Kanji	Springer Science & Business Media
2	Fundamentals of Quality Control and Improvement	Amitva Mitra	Wiley India Private Limited
3	Manual on Quality Control	--	Gujarat Engineering Research Institute
4	Ambuja Technical Literature Series	--	Ambuja Cements

BIS & Other Standard Codes:

National Building Code, ISO 9000/14000 and other standards