Marwadi University

Master of Technology

Construction Project Management

Construction Quality & Safety Management

01CP0108

Objective of the Course:

Objectives of introducing this subject at second year level in civil branches are:

- To learn Quality and Safety management principles.
- To study quality management tools: Six Sigma and TQM.
- To understand the Quality and Safety Management System and its implementation in Construction Projects.
- To learn about the Safety laws for Compliance for all safety programs.

Credits Earned: 3

Course Outcomes

After completion of this course, student will be able to

- Students will be able to use the quality management tools and techniques in Construction projects improve the quality of the structure.
- Interpret the quality standards and concepts in Construction industry.
- To categorize safety manuals and safety practices in Construction Project.
- To Design and Reframe the Safety Policies, methodologies, Trainings, Legal requirements with respect to Construction Project.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA	CSE	Viva (V)	Term work (TW)	
3	0	0	3	50	30	20	25	25	150

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Detailed Syllabus:

Sr. No	Topic name	Hours
1	**Introduction to Quality Management**	**6**
	Quality Management – Introduction : Quality; Quality History; Quality Inspection; Quality Engineering; Quality Management; Quality Assurance; Quality Control; Quality Control Tools **Quality Management** Quality Management Gurus & their Philosophies, Statistical Process Control, Principles of Transformation, The Seven Point Action Plan for Quality in Construction.	
2	**Total Quality Management (TQM)**	**10**
	Definition & Concept; changing views of Quality; Principles of TQM – Basic Components, Phases, Elements, Application in Construction Projects Six Sigma Introduction; Six Sigma Methodology; **Six Sigma** Roadmap; Leadership Principles; Six Sigma Team; Analytic Tool Sets – FORD Global 8D Tool; DMAIC Process; DMADV Process; DMAIC Process; DMADDD Process; Application in Construction Projects	
3	**Quality Management System**	**10**
	Introduction; Quality Standards; Standards Organizations; International Organization for Standardization (ISO); QMS Certification & Quality Cost QMS Certification: ISO Certification - Process Methodology & Schedule; Integrated Quality Management System – Methodology; Quality Cost: Introduction; Categories of Costs; Reasons for Poor Quality; Quality Cost in Construction; Quality Performance Management System QA/QC Observation & Surveillance; Issuance of Non- Conformance reports; Corrective & Preventive actions; Quality Reports; QA/QC Audit & Reporting	
4	**Introduction to Safety Management**	**5**
	Introduction to Construction Safety and Safety Technology Government's policy in industrial safety, safety & health legislation in India, Construction Sites (Safety) Regulations, Codes of practice, Role of various parties, duties and responsibilities of top management, site managers, supervisors etc. role of safety officers, responsibilities of general employees, safety committee, safety training, incentives and monitoring, Writing safety manuals, preparing safety checklists and inspection reports	

5	**Safety in Construction Projects**	**5**
	Safety of accidents on various construction sites, safety at various stages of construction, Critical factors for failure, Prevention of accidents, Regular Inspection and monitoring, Safety measures, Accidents and their Causes, Human Factors in Construction Safety, Costs of Construction Injuries, Occupational and Safety Hazard Assessment, Legal Implications Accident Prevention: Principles of accident prevention; job safety analysis; fault tree analysis; accident management.	
6	**Implementation of Safety programs and Policies**	**6**
	Construction Safety Management and Accident Prevention Safety training, safety policy, Safety Meetings, safety committees, safety inspection, safety audit, reporting accidents and dangerous occurrences, Safety Incentives. Problem areas in Construction Safety, Elements of an Effective Safety Programme, Job-Site Safety Assessment, Methods, equipment, and training provided on any ISO approved Construction Company, safety in office. Objectives, Importance of health and safety, Classification of occupational health hazards, Occupational health risk management in construction, Health monitoring, Nature and causes of occupational injury or illness, Project organisation and OHS, OHS risk management, OHS legislation, the psychology of OHS, Behavioral safety management, Using IT to manage OHS, and OHS training.	
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Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
15%	15%	20%	20%	20%	10%

Instructional Method and Pedagogy:

At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.

1. Prerequisite of the course and its pattern shall be discussed on the commencement of the course.
2. Lectures shall be conducted in class room using various teaching aids.
3. Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation.
4. At the end of each unit/topic an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work.
5. The laboratory experiments are planned in such a way that it covers the practical aspects of the course contents. The performance of these experiments shall bring the clarity of the theoretical concepts which the students have studied during the academic sessions.

Recommended Study Material

Reference Books:

1. Rumane, Abdul R. “Quality Management in Construction Projects”, CRC Press
2. Juran, J.M., and Godfrey, A.B. (1999). Juran’s Quality Handbook, Fifth edition, New York: McGraw-Hill.
3. PMBOK Guidelines
4. Thorpe, B., Sumner, P., and Duncan, J. (1996). Quality Assurance in Construction. Surrey, U.K.: Gower Publishing Ltd.
5. Safety Management in Construction Industry – A manual for project managers. NICMAR Mumbai.
6. Davies V. S. Thomasin, K, Thomas, “Construction Safety Handbook”, (Telford, London.)
7. ISI for safety in Construction – Bureau of Indian Standards.
8. Giri maldi and Simonds, “Safety management”, (AITBS, New Delhi)