



# GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering

Subject Code: 3721413

Quality Control & Safety Management in Construction

2<sup>nd</sup> SEMESTER

Type of Course: Elective

Prerequisite: NIL

Rationale: Students would be able:

- To understand the elements of quality planning and the implication
- To become aware of objectives and advantages of quality assurance
- To be exposed to means of quality control
- To study the relationship between quality and safety management

## Teaching and Examination Scheme

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE	PA(M)	Viva	PA (I)		
3	0	2	4	70	30	30	20	150

## Course Contents

Sr.No.	Topics	Hrs.
1	<b>Quality Management Systems</b> Types of organizations – Inspection, control and enforcement – Quality management systems and method – responsibilities and authorities in quality assurances and quality control –Architects, engineers, contractors and special consultants, quality circle	04
2	<b>Quality Policy</b> Quality policy – Objectives and methods in construction industry – Consumers satisfaction, economics – Time of completion – statistical tolerance – Taguchi's concept of quality – Codes and standards – Contract and construction programming – Inspection procedures – Processes and products – Total QA / QC programme and cost implication - ISO 9004 – Quality System Standards	08
3	<b>Quality Objectives</b> Regularity agent, owner, design, contract and construction oriented objectives, methods – Techniques and needs of QA / QC – Different aspects of quality – Appraisals, Factors influencing construction quality. Histogram, Parcto diagram, Fishbone diagram, quality control chart, testing required for quality control of construction material used in RCC work – destructive and Non Destructive Test, Application of Six Sigma tool to RCC work in building.	12
4	<b>Construction Safety</b> Occupational Safety, Health and Environment Management System, Bureau of Indian Standards on Safety and Health: 14489 –1998 and 15001- 2000, ILO and EPA Standards.	12



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	<p>SHE: Element of training cycle, Assessment of needs. Techniques of training, design and development of training programs, Training methods and strategies, types of training, Evaluation and review of training programs.</p> <p>Construction safety management: 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.</p> <p>Safety in Construction Operations: Safety of accidents on various construction sites such as buildings, dams, tunnels, bridges, roads, etc. Preventions of accidents, safety measures, safety in use of construction equipment and electrical appliances.</p>	
	<b>Total</b>	<b>39</b>

## Reference Book(s)

- Construction inspection handbook – Quality assurance and quality control by James, J O Brian, Van Nostrand, New York
- Quality Planning and analysis by Juran Frank, J M and Gryna, Tata McGraw Hill
- ISO 9000 By Hutchins.G, Viva Books, New Delhi
- Productivity Improvement in Construction by Clarkson H Oglesby, Tata McGraw Hill
- The Management of Quality in Construction By John L Ashford, E & F, N Spon, New York
- Quality Improvement Techniques in Construction by Steven McCabe, Addison Wesley Longman Ltd, England.
- Construction safety manual published by National Safety Commission of India
- Construction safety Handbook – Davies V S Thomasin K, Thomas Telford, London
- ISI for safety in construction – Bureau of Indian standard
- Safety Management – Girimaldi and Simonds, AITBS, New Delhi

## Course Outcome

Sr. No.	CO statement	Marks % weightage
CO-1	Students would be able to apply concepts of quality management systems	20%
CO-2	Students would be able to comprehend quality policy and objectives of quality assurance and quality control	45%
CO-3	Students would be able to design construction processes to minimize safety hazards	35%

## Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
<b>10</b>	<b>25</b>	<b>20</b>	<b>20</b>	<b>15</b>	<b>10</b>



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Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C:  
Create and above

List of Open Source Software/learning website: [www.nptel.ac.in/courses/](http://www.nptel.ac.in/courses/)