GUJARAT TECHNOLOGICAL UNIVERSITY

METALLURGY ENGINEERING (21)
QUALITY ENGNEERING & INDUSTRIAL SAFETY
SUBJECT CODE:2182109
B.E. 8th SEMESTER

Type of course: Science & Engineering

Prerequisite: This particular course covers the role of quality in engineering, management & Tools to control the quality & assurance. Introduces various statistical methods and approaches towards quality measurement, monitoring & control. Course tries to inculcate among engineering graduates the safety awareness in every aspect of the industries.

Rationale: NA

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
4	2	0	6	70	20	10	30	0	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Quality: Introduction, Philosophical approach, Cost of quality, Overview of the works of Juran, Deming, Crosby, Taguchi, PDCA cycle, Quality control, Quality assurance.	10	16
2	Quality organization, Quality management, Quality system, Quality audit, Vendor quality assurance, Total quality management, Quality awards, Quality certification, Typical procedure for ISO 9000, ISO 14000.	10	16
3	Variations: Analysis of variance, Statistical tools, Statistical quality control, Control charts, Process capability analysis, Statistical process control.	12	22
4	Inspection: Inspection by sampling, Acceptance sampling, Statistical approaches, Single, double and multiple sampling plans.	08	14
5	Reliability: Concept, Difference between reliability and quality, Different measures of reliability, Time to failure distributions, MTBF (Mean Time Between Failure), MDT (Mean Down Time), MTTR (Mean Time To Repair).	10	16
6	Industrial safety: Accident prevention, Safety aspects in the use of machines and equipment, Safety in material handling, Training for safety, Safe practices in industry, Provisions for safe working, Create a safe environment, Personal protection and welfare, and Some View Points on Safety.	10	16
	Total	60	100

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	**30**	**35**	**10**	**10**	**05**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Quality Control and Application by B. L. Hansen and P. M. Ghare, PHI, Eastern Economy Edition.
2. Industrial Hand Book by William Handling, Mc-Graw-Hill.
3. Quality Planning and Analysis by J. M. Juran and F. M. Gryna, Mc-Graw Hill

Course Outcome:

After learning the course the students should be able to:

- Explain the need of the quality & various tools of quality assessments.
- Explain the role of quality engineer in Industries.
- Apply various statistical tools to monitor / assess the quality.
- Suggest the sampling plan for inspection of goods.
- Develop self-know-how towards safety practices required to be maintained in industries.

List of Open Source Software/learning website:

- asq.org/pub/qe/
- http://advisera.com/9001academy/2015transition/
- https://accessengineeringlibrary.com/browse/industrial-safety-management-hazard-identification-and-risk-control.
- https://www.safeopedia.com/definition/1052/industrial-safety

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should be submitted to GTU.