SEMESTER S7

SIX SIGMA

Course Code	PEMRT752	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	3	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	None/ (Course code)	Course Type	Theory

Course Objectives:

1. To provide a comprehensive understanding of quality management principles, including the evolution of Total Quality Management (TQM) and the contributions of key TQM pioneers, along with the application of quality tools and methodologies for continuous improvement.
2. To develop proficiency in Six Sigma methodologies and their practical applications in both manufacturing and service industries, emphasizing process capability, DMAIC phases, and achieving customer satisfaction through quality enhancement.

KTU SPECIAL

SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Introduction to the concept of quality - definition, quality quantified, dimensions of quality, TQM – definition, new and old cultures, Gurus of TQM – Deming, Juran, Shewhart, Crossby, Fiegenbaum, Ishikawa, Taguchi – their main contributions, Obstacles to TQM, Benefits of TQM.	9
2	TQM axioms – commitment, scientific knowledge and involvement, Deming's fourteen points on quality management, Quality Council, Quality statements, customer satisfaction – customer perception of quality, customer retention, Employee involvement - motivation, empowerment, team and teamwork, suggestion system.	9
3	Continuous process improvement - Juran's quality trilogy, Seven basic tools of quality – flow chart or run chart, check sheet, histogram, Preto diagram, cause and effect diagram, scatter diagram and control charts, Benchmarking, New management tools – affinity diagram, inter relationship digraphs, tree diagram, matrix diagram, prioritization matrices,	9

	Process Decision Program Chart (PDPC), activity network diagram	
4	Six sigma –meaning- History of six sigma- working of six sigma-Process capability – meaning, significance and measurement – Six sigma roles and responsibilities- DMAIC process- Define phase-Measure phase- Aanalyse phase- Improve phase- Control phase- Case examples of DMAIC. Six sigma in manufacturing industries- Six sigma in service industries.	**9**

Course Assessment Method
(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	**15**	**10**	**10**	**40**

KTU SPECIAL

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Understand basic concepts of quality highlighting the contributions by quality gurus	**K2**
CO2	Acquire knowledge on TQM axioms and focus on customer-centric approach with team work	**K2**
CO3	Acquire knowledge on TQM axioms and focus on customer-centric approach with team work	**K2**
CO4	Understand the various quality management systems	**K2**
CO5	Understand basic concepts and DMAIC phase of Six Sigma	**K2**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1									3	2
CO2	2	1									3	2
CO3	3	2						2	3		3	2
CO4	2	1					2	3	2		3	2
CO5		3			3		2		2			2

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation*

KTU SPECIAL

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Total Quality Management	Besterfield, D.H., Besterfield, C., Besterfield, G.H., Besterfield M	Pearson Education	5th Edition
2	The Management and Control of Quality	James, R.E., and William, M.L.	Cengage Learning	8th ed, 2010
3	Total Quality Management - Text and Cases	Janakiraman, B. and Gopal, R.K.	Prentice Hall India	1st edition, 2006

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	The Six Sigma Handbook	Pyzdek, T., and Keller, P	McGraw-Hill.	5th edition, 2018
2	Six Sigma Revealed	International Six sigma institute	International Six sigma institute	Free pdf

KTU SPECIAL

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	NPTEL, Total Quality Management - I, IIT Kanpur https://nptel.ac.in/courses/110104080
2	UDEMY, OHSAS 18001 (2.5 hours) https://www.udemy.com/complete-health-and-safety-auditor-course-ohsas-18001/
3	UDEMY, Quality Management System Auditor Course (3.5 hours) https://www.udemy.com/iso-90012015-quality-management-system-auditor-course/
4	NPTEL, Six Sigma, IIT Kharagpur https://nptel.ac.in/courses/110105123