



MASTER OF SCIENCE IN APPLIED STATISTICS
M.Sc. Applied Statistics, Semester – II

Course Code	PS02EAST51	Title of the Course	LEAN SIX SIGMA METHODOLOGY
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	<p>The aim of this course is for the student to:</p> <ol style="list-style-type: none"> 1. Understand the scope and breadth of a Lean Six Sigma initiative. 2. Gain an understanding of what waste is and how to identify it so that it can be reduced. 3. Become aware of variation and techniques to reduce it. 4. Become familiar with the DMAIC, DMEDI, DMADV, etc. project models.
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Course Content		
Unit	Description	Weightage* (%)
1.	Overview of Lean and Six Sigma with principles. Methodologies – Introduction to SCORE, DMAIC, DMADV. The nine Wastes in the process Industries, Voice of the customer, SIPOC. Value- Importance, value-adding and non-value-adding activities. Value Stream Mapping(VSM): Objective, Concept of flow- lead time, takt time, cycle time, throughput time, generating the map, Analyzing the current state map. Generating Potential Solutions for the Future State-Brainwriting, Escapism, Random Stimulus, Analogies, SCAMPER. Future state VSM.	25
2.	Total Productive Maintenance- availability, performance and quality, Overall Equipment Effectiveness (OEE) and Uptime. Single Minute Exchange of Dies (SMED), Visual Management- Importance, visual work area, visual displays and scheduling. Kaizen, Pull-Push systems and perfection. Bottleneck-Finding, managing and improving it. Poka-Yoke, tools used to get to root cause, Kanban, finished goods, buffer and safety stocks calculations. Resource Reliability Enhancement.	25
3.	Six Sigma Roles and Responsibilities. Tools used in Define Phase. Tools used in Measure Phase. Spaghetti diagram.	25
4.	Tools used in Analyze Phase. Various Statistical Techniques used in analyze Phase (Revision), Tools used in Improve/Design Phase. Tools used in Control/Verify Phase.	25

Teaching-Learning	Interactive Class Lectures, ICT tools used
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Methodology	
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	to understand issues & challenges in implementing & developing lean manufacturing techniques from TPS & its contribution for improving organizational performance.
2.	apply lean techniques to bring competitive business culture for improving organization performance
3.	analyze how lean techniques can be applied to manufacturing & service industry
4.	developing lean management strategy for Supply chain management
5.	analyzing how lean technique can create value generation for organization.

Suggested References:	
Sr. No.	References
1.	King, P. L. (2009). Lean for the Process Industries, Dealing with Complexity, First Ed. (CRC Press).
2.	Wilson, L (2010). How to Implement Lean Manufacturing, First Ed. (McGraw Hill).
3.	Issa Bass and Barbara Lawton (2010) Lean Six Sigma using SigmaXL and Minitab, First Ed.(McGraw Hill).
4.	Munro, R. A., Maio, M. J., Nawaz, M. B., Ramu, G. and Zrymiak, D. J. (2009). The Certified Six sigma Green belt, Handbook First Ed. (Pearson).





5.	Kubiak, T. M. and Benbow, D. W. (2010). The Certified Six sigma Black belt, Handbook Second Ed. (Pearson).
6.	Thomas P. and Paul K. (2010) The Six sigma Handbook, A complete guide for green belts, black belts and managers at all levels, Third Ed. (McGraw Hill).

On-line resources to be used if available as reference material
On-line Resources

