GUJARAT TECHNOLOGICAL UNIVERSITY

MECHANICAL (ADVANCE MANUFACTURING SYSTEM) (50)
LEAN MANUFACTURING SYSTEM AND IMPLEMENTATION
SUBJECT CODE: 2745003
M.E. 4TH SEMESTER

Type of course: Engineering Science

Prerequisite: Zeal to learn.

Rationale: This course is designed to provide the students the complete insights of various lean tools, techniques and lean implementation strategies. The benefits of lean implementations and its effect on operational performance.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
				Theory Marks		Practical Marks				
L	T	P	C	ESE (E)	PA (M)	ESE (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	INTRODUCTION TO LEAN MANUFACTURING • Conventional Manufacturing versus Lean Manufacturing – Principles of Lean Manufacturing – Basic elements of lean manufacturing – Introduction to LM Tools.	7	15%
2	CELLULAR MANUFACTURING, JIT, TPM: • Cellular Manufacturing – Types of Layout, Principles of Cell layout, Implementation. • JIT-Principles of JIT and Implementation of Kanban. • TPM – Pillars of TPM, Principles and implementation of TPM.	9	20%
3	SET UP TIME REDUCTION, TQM, 5S, VSM: • Set up time reduction – Definition, philosophies and reduction approaches. • TQM – Principles and implementation. • 5S Principles and implementation – • Value stream mapping - Procedure and principles.	9	20%
4	Lean manufacturing Implementation: • Understanding various lean implementation frameworks • Steps for lean manufacturing implementation • Enablers and Barriers of Lean implementation	9	25%
5	Case Study: • Various case studies of implementation of lean manufacturing at industries	9	20%

Reference Books:

1. N. Gopalkrishnan, Simplified Lean Manufacture, PHI Learning Private Limited. New Delhi
2. How to Implement Lean Manufacturing, Lonnie Wilson, McGraw Hill, August 2009.
3. Design and Analysis of Lean Production Systems, Ronald G. Askin & Jeffrey B. Goldberg, John Wiley & Sons, 2003
4. William M. Feld , Lean Manufacturing: Tools, Techniques, and How to Use Them ,The st Lucie Press.
5. Rother M. and Shook J, 1999 'Learning to See: Value Stream Mapping to Add Value and Eliminate Muda' , Lean Enterprise Institute, Brookline, MA.
6. Mikell P. Groover (2002) 'Automation, Production Systems and CIM

Course Outcome:
It is desired that at the end of the course, the student will be equipped with the basic knowledge of lean manufacturing, tools, techniques and implementation outcomes.

List of Tutorials:
Students should be given the tutorials and presentations based on case studies of lean implementation in various Industries, its performance measures and benefits.

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.