



SECOND SEMESTER 2015-16

Course Handout (Part II)

Date: 15/01/2016

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : MF F418
Course title : LEAN MANUFACTURING
Instructor-in-charge : ABHIJEET K. DIGALWAR

Course description

Fundamentals of continuous improvement, value added and waste elimination, elements of lean production: small lot production, setup time reduction, maintaining and improving equipment, pull production systems, focused factories and group technologies, work cells and cellular manufacturing, standard operations, quality of design, systems for eliminating defects, simplified production planning and control systems: scheduling for smooth flow, synchronizing and balancing process, planning and control in pull production, beyond the production systems: managing the supply chain, activity based costing, performance measurement.

Scope

In factories around the globe, Toyota consistently raises the bar for manufacturing, product development and process excellence. The result is an amazing business success story: steadily taking market share from price-cutting competitors, earning far more profit than any other automaker, and winning the praise of business leaders worldwide. With a market capitalization greater than the value of General Motors, Ford and Chrysler combined; Toyota is the world's most profitable automaker. Toyota's well known "secret weapon" is lean manufacturing – the revolutionary approach to business processes that it invented in the 1950's and has spent decades for perfecting. Today business around the world is attempting to implement Toyota system to maintain competitive advantage. But are they?

The course explains Toyota's unique approach to Lean manufacturing, that drive Toyota's quality and efficiency obsessed culture. You will valuable insights that can be applied to any organization and any business process, whether in services or manufacturing. You will discover how the right combination of long term philosophy, processes, people and problem solving can transform your organization into a lean, learning enterprise – the Toyota way.





Objectives

- Opportunity to see Toyota at close
- To provide a clear and simple guide to lean manufacturing / Toyota production system
- Provides a great way to begin learning and opportunity for you to start your own journey (The Toyota Way)

At the end of this course, the students will be able to understand the importance of lean manufacturing / The Toyota Way as a strategic weapon, the students will be able to understand the World –Class power of the Toyota way

Text books

T1. Pascal Dennis, "Lean Production Simplified", 2nd Edition, Productivity Press, 2007.

T2. Jeffrey K. Liker, "The Toyota Way", McGraw-Hill Edition, New Delhi, 2004.

Reference books

Masaaki Imai, "Gemba Kaizen: A Commonsense, Low-Cost Approach to Management", McGraw-Hill, 1997.

James P. Womack and Daniel T. Jones, "Lean Thinking: Banish Waste & Create Wealth in Your Corporation, Revised Edition, Simon & Shuster, 2001.

Mike Rother, "Learning to See: Value Stream Mapping to Create Value & Eliminate MUDA", Lean Enterprise Institute, 2003.

Jeffrey K Liker and David Meier, "The Toyota Way Field Book: A Practical Guide for Implementing Toyota's 4Ps", Tata McGraw-Hill Edition, 2006.

John Allen, Charles Robinson and David Stewart, "Lean Manufacturing: A Plant Floor Guide", Society of Manufacturing Engineers, Michigan, 2001.

Mike Rother, "Toyota Kata: Managing People for Improvement, Adaptiveness, and Superior Results", Tata McGraw-Hill Edition, 2010.

Nicholas, John M., "Competitive Manufacturing Management", Tata McGraw Hill Education Pvt. Ltd. New Delhi, 2012





Course plan

Lecture Number	Learning objectives	Topics to be covered	Refer to Chapter, (Book)
1-3	Types of production systems, growing dysfunction, birth of lean production, virtue of necessity, lean revolution at Toyota	Birth of lean production	1, (T1)
4-5	Why lean production? Systems and systems thinking, basic image of lean production, customer focus, muda	Lean production system	2, (T1)
6-10	Standards in lean system, 5S system, total productive maintenance	Stability	3, (T1)
11-15	Lean thinking, why standardized work? Elements of standardized work, Standardized work and kaizen, common layouts	Standardized work	4, (T1)
16-24	Why JIT, principles of JIT, JIT system, kanban, kanban rules, expanded role of conveyance, production levelling, three types of pull systems, value stream mapping	Just-In-Time	5, (T1)
25-30	Development of Jidoka concept, why jidoka, poka-yoke, inspection systems and zone control, using poka-yokes and implementing jidoka	Jidoka	6, (T1)
31-32	Why involvement? The terrible waste of humanity, activities supporting involvement, kaizen circle activity, practical kaizen training, suggestion programs	Involvement	7, (T1)
33-34	What is planning? Why plan? problems with planning, hoshin planning, hoshin planning system, four phases of hoshin planning	Hoshin planning	8, (T1)
35-36	What is lean culture? How does lean culture feel?	The culture	9, (T1)
37	Operational excellence as a strategic weapon, story of Toyoda family and Toyota production system (TPS), heart of the TPS: eliminating waste, 14 principles of Toyota way, Toyota way in action	The world-class power of the Toyota way	1-6, (T2)
37	Principle 1: Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals	Long-term philosophy	7, (T2)
38	Principle 2: Create continuous process flow to bring problems to the surface	Continuous flow	8, (T2)
38	Principle 3: Use "Pull" systems to avoid overproduction	Pull system	9, (T2)
39	Principle 4: Level out the workload (Heijunka)	Heijunka	10, (T2)
39	Principle 5: Build a culture of stopping to fix problems, to get quality right the first time	First time through	11, (T2)
40	Principle 6: Standardized tasks are the foundation for continuous improvement and employee empowerment	Task Standardization	12, (T2)





Lecture Number	Learning objectives	Topics to be covered	Refer to Chapter, (Book)
40	Principle 7: Use visual control so no problems are hidden	Visual Control	13, (T2)
41	Principle 8: Use only reliable, thoroughly tested technology that serves your people and process	Use of IT	14, (T2)
41	Principle 9: Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others	Leadership development	15, (T2)
42	Principle 10: Develop exceptional people and teams who follow your company's philosophy	People development	16, (T2)
42	Principle 11: Respect your extended network of partners and suppliers by challenging them and helping them improve	Supplier development	17, (T2)
43	Principle 12: Go and see yourself to thoroughly understand the situation (Genchi Genbutsu)	<i>Genchi Genbutsu</i>	18, (T2)
43	Principle 13: Make decisions slowly by consensus, thoroughly considering all options; Implement decisions rapidly	Decision making	19, (T2)
44	Principle 14: Become a learning organization through relentless reflection (Hansei) and continuous improvement (kaizen)	<i>Hansei</i> and <i>kaizen</i>	20, (T2)
44	Using the Toyota way to transform technical and service organizations, build your own lean learning enterprise, borrowing from the Toyota way	Applying the Toyota way in your organization	21-22, (T2)

Evaluation scheme

EC No.	Evaluation Component	Duration	Weightage	Date & Time	Nature of the Component
1	Mid Sem. Test	90 Min	30%	18/3 9:00 - 10:30 AM	CB
2	Assignments/ Term Paper/Project/Surprise Tests		30%	TBA	
3	Compre. Exam		40%	12/5 FN	CB/OB

Chamber consultation hour: Monday 12 to 1 PM. Chamber No. 2227

Notices: All notices regarding the course will be displayed only on the **Mechanical Engineering Deptt.** notice board.

Instructor In-charge
MF C418

