Amrita Vishwa Vidyapeetham University
Amrita School of Business
Elective course on 'Manufacturing Systems'
II MBA / IV Trimester
Course Plan (Updated 16th June 2016)

Instructor: Dr. Suresh M. **Total No. of hours**: 30

Course Description

Modern industry requires managers who can effectively deploy modern approaches to manufacturing. In recent times, flexible, lean and agile manufacturing has become a major area of attention to managers owing to its strong impact on profitability and efficiency. Manufacturing firms are increasingly adopting lean and agile systems to gain competitive advantage. Lean systems could eliminate wastes and streamline the manufacturing process. Agile systems enable the speedy production and deliver variety of products in a cost effective manner. Although many manufacturing organizations around the world have adopted a combination of lean and agile systems in practice, cohesive procedures are yet to evolve for successful implementation. In this context, this course is designed for imparting knowledge on modern manufacturing systems which are largely dominated by flexible, lean and agile manufacturing principles.

Manufacturing Systems course is organised in three modules. It opens with the basic concepts of Flexible Manufacturing System (FMS), and then focuses on lean manufacturing principles with their application procedures in both traditional and modern organisations. It then focuses on the agile manufacturing principles and its implementation under four drivers: management, technology, manufacturing strategy and competitiveness. This course uses case studies related to application of flexible lean and agile manufacturing for effective learning to manage modern manufacturing systems and face challenges in competitive markets.

Prerequisite:
Production and Operations Management- I & II courses.

Location & Meeting Times:

Classroom: CR-4, 2nd Floor, Amrita School of Business

Faculty contact hours for technical discussions /case study: 3.00PM. to 4.30 PM.@ Faculty cabin F-09, ASB.

Assessment:
Assessment is based on the expectations and the levels of achievement in all the four key areas – communicating, knowledge/understanding, thinking/inquiry, and application/use. The specific evaluation components will be as follows:

- Case study analysis :10 %
- Industrial visit /and class participation :10 %
- Recent trends in Lean and Agile Systems (Literature Review) :10%
- Mid-Term Exam :30 %
- Final Examination :40 %

Course Objectives:

- To help in understanding the differences between past and present methods of managing manufacturing systems and importance of flexible, lean and agile manufacturing systems.

- To help in learning the theory of flexible, lean and agile manufacturing systems, and their applications in traditional and modern manufacturing firms.

- To help in improving the skills of using the lean tools and techniques, in critical thinking especially in waste elimination in manufacturing systems.

Learning Goal: Critical and Integrative Thinking

- Students will demonstrate ability to identifying and defining the issues in manufacturing systems and understanding its root causes. Analysing the problem in effective manner to provide appropriate solution to the manufacturing firms.

Learning Objectives:

On successful completion of this course, the student should be able to:

- Understand the basic principles of flexible, lean and agile manufacturing systems
- Understand the different types of waste observable in manufacturing systems
- Mapping the Value stream on current and future state of manufacturing systems
- Develop a continuous improvement plan for an existing manufacturing systems
- Apply steps necessary to implement flexible, lean and agile systems in manufacturing plants
- Facilitate and guide teams in making the change to the flexible, lean and agile culture

Course Requirements:

Students are expected to attend all sessions and arrive for class promptly. Students are allowed maximum three absences during this course. All case studies must be submitted by their due dates.

Session-by-Session Outline:

Session No.	Topic	Text Book
FLEXIBLE MANUFACTURING SYSTEMS (FMS)		
Session -1	FMS Introduction and Manufacturing Cell	Shivanand et al.,; Chapter-1&2
Session -2	Group Technology & Machining Centers	Shivanand et al.,; Chapter-4&5
Session -3	Automated Material Movement and Storage System	Shivanand et al.,; Chapter-8
Session -4	FMS Installation and Implementation	Shivanand et al.,; Chapter-12
Session -5	Case Study-I: The Rover LM-500 FMS. Case Study-II: The HNH (Hattersley Mewman Hender) FMS	Page no.:137 Shivanand et al., Page no.:139 Shivanand et al.,

LEAN MANUFACTURING SYSTEMS		
Session -6	Lean Manufacturing through Waste Elimination.	Devadasan et al.,; Chapter-2
Session -7	Value Stream Mapping.	Devadasan et al.,; Chapter-3
Session -8	Kaizen in Lean Manufacturing Paradigm.	Devadasan et al.,; Chapter-5
Session -9	Pull Production through Kanban Card System.	Devadasan et al.,; Chapter-7
Session -10	One Piece Flow Production System.	Devadasan et al.,; Chapter-8
Session -11	Visual Management.	Devadasan et al., ;Chapter-9
Session -12	Lean Manufacturing through Total Productive Maintenance.	Devadasan et al., ;Chapter-10
Session -13	Implementation of Lean Manufacturing Paradigm in Traditional and Moderate Organisations.	Devadasan et al., ;Chapter-11
Session -14	Case Study-III: Application of Lean System in Indian Eye Hospital.	Venkatraman and Suresh (2014).
Session -15	Case Study-IV: The Toyota Production System.	Page no.:120 Shivanand et al.,
AGILE MANUFACTURING SYSTEMS		
Session -16	The Fundamental Structure of Agile Manufacturing Paradigm.	Devadasan et al.,; Chapter-12
Session -17	Agile Manufacturing through Management Driver.	Devadasan et al.,; Chapter-13
Session -18	Agility through Technology Driver.	Devadasan et al., ;Chapter-14
Session -19	Agility through Manufacturing Strategy Driver.	Devadasan et al., ;Chapter-15
Session -20	Agility through Competitive Driver.	Devadasan et al., ;Chapter-16
Session -21	Implementation of Agile Manufacturing Paradigm in Moderate and Smart Organisations.	Devadasan et al., ;Chapter-17
Session -22	Case Study-V: General Motors Leverages Common Architecture to Strategic Advantage.	Page no.:124 Shivanand et al.,
Session -23	Case Study-VI: Thirty-criteria-based agility assessment: a case study in an Indian pump manufacturing organisation	Vinodh et al., (2012),
Session -24	**Presentation:** Recent advances in manufacturing systems	

Text books and research papers:

(1). Devadasan, S. R. , Sivakumar, V. M., Murugesh, R., Shalij, P. R.,"Lean and Agile Manufacturing: Theoretical, Practical and Research Futurities," 2012, *Prentice-Hall* of *India* Pvt. *Ltd*. India.

(2). Shivanand H.K., Benal M.M.., and Koti.V., Flexible manufacturing system, 2006, New Age International (P) Ltd., Publishers, New Delhi, India.

(3).Venkatraman. J., and Suresh M.,(2014) "Application of Lean System in Indian Eye Hospital," Indian International Research Journal of Management Studies and Social Science, Vol.1(1),pp.121-126.

(4). Vinodh,S., Uday Kumar, V., and Jeya Girubha, R. (2012), "Thirty-criteria-based agility assessment: a case study in an Indian pump manufacturing organisation," The International Journal of Advanced Manufacturing Technology, Vol.63(9-12), pp. 915-929.

Communication information of the instructor:

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