MDSL 807	Lean Supply Chain Management	L	T	P	C
Version 1.0		3	0	0	3
Pre-requisites/Exposure	Graduate in Engineering/Science discipline				
Co-requisites					

Course Objectives

a) To understand lean management principles & provides an understanding of factors that contribute to organizational wastes, examining ways to eliminate wastes, & developing & implementing an improved organizational processes, for significant impact to the company's bottom line.
b) To understand how lean management today represents a profound change in the competitive business culture and a leading indicator of excellence in the organization.
c) To understand how lean management principles is developed from Toyota Production System(TPS)
d) Developing an understanding of basic principles of lean management strategy, in POM (production & operations management) & supply chain management.
e) To understand how by implementing lean management organizations can improve product & processes without adding any more money, people, equipment, inventory or space and aim for perfection.

Course Outcomes

On completion of this course, the students will be able to

CO1. To understand issues & challenges in implementing & developing lean manufacturing techniques from TPS & its contribution for improving organizational performance.
CO2. Apply lean techniques to bring competitive business culture for improving organization performance
CO3. Analyze how lean techniques can be applied to manufacturing & service industry
CO4. Developing lean management strategy for Supply chain management
CO5. Analyzing how lean technique can create value generation for organization.

Catalog Description

Lean Supply Chain Management is a way to eliminate waste, reduce cycle time and improve operational efficiencies in a manufacturing/service environment. Lean focuses on flow, value stream and elimination of waste when compared to traditional mass production systems the overall goal is production of goods/services with less waste, human effort, manufacturing space, inventory and time. This course will provide students with a basic understanding of the components of Lean Management and the opportunity to practically apply the principles, methods and tools of Lean Management to real problems. Some of the fundamental benefits of Lean Management to be addressed through course include lower production cost, lower inventories, reduced lead time, improved flexibility and lead times

Course Content

Unit I: INTRODUCTION to TPS & Lean [9 Lecture Hours]
Introduction to Toyota Production System(TPS), Pillars of TPS- JIT & Heijunka, TPS core principles, seven deadly supply chain wastes, Introduction to lean, lean manufacturing implementation, the machine that change the world, world class manufacturing

Unit II: Lean Manufacturing [9 Lecture Hours]
Philosophy & objectives of lean manufacturing, TPS vs Lean, mass manufacturing vs lean manufacturing, foundation of quality control & foundation of quantity control, significance of lead time, benefits of lead time reductions, techniques to reduce lead times, 5s, Littles law, OEE, MSA

Unit III: Lean Implementation [10 Lecture Hours]
Fundamental issues of cultural changes, problem solving & standardization, strategies to become lean- takt calculation, basic time study calculation, balancing study, spaghetti study, value stream mapping, cellular manufacturing

Unit IV: Lean & six sigma [8 Lecture Hours]
Problem solving method, history of quality & six sigma, statistical process control, charting, Quality function deployment.

Text Books

1. Gerhard Johannes Plenert (2007) "Reinventing lean: introducing lean management into the supply chain
2. William M Feld(2006) "Lean manufacturing tools & techniques & how to use them"

Reference Books

1. Lean production for competitive advantage- a comprehensive guide to lean methodologies & management practice, John Nicholas, 2011, Productivity Press, NY. ISBN-978-1-4398-2096-4
2. Improving business performance with lean, James R Bradley, 2012, Business expert Press, NY, ISBN-978-1-60649-246-2

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Internal Assessment (Class Participation/Project Assignment/Quiz)	ESE
Weightage (%)	50 Quiz- 10 Assignment-10 Class participation- 10 Project- 20	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs

	COURSE OUTCOMES (COs)	POs
CO 1	To understand issues & challenges in implementing & developing lean manufacturing techniques from TPS & its contribution for improving organizational performance	PO 1,2, 3,4,7,8,9,10, 11,13, 14
CO 2	Apply lean techniques to bring competitive business culture for improving organization performance	PO 1,2, 3, 7,8,9,10, 11,14
CO 3	Analyze how lean techniques can be applied to manufacturing & service industry	PO 1,2, 3, 8,9,10, 11, 13,14
CO 4	Developing lean management strategy for Supply chain management	PO 4,5, 8,12,13, 14
CO 5	Analyzing how lean technique can create value generation for organization.	PO 1,2,3,4,7,8,9,10

Program Outcome / Course Outcome mapping

Course Outcomes	CO 1	CO 2	CO 3	CO 4	CO5
PO 1	3	3	3	2	3
PO 2	3	3	3	2	3
PO 3	3	3	3	2	3
PO 4	3	1	1	3	3
PO 5	2	2	1	3	1
PO 6	1	1	1	1	1
PO 7	3	3	1	2	2
PO 8	3	3	3	3	3
PSO 9	3	3	3	1	1
PSO 10	3	3	3	2	1
PSO 11	3	3	3	2	2
PSO 12	1	1	1	3	2
PSO 13	3	1	3	3	3
PSO 14	3	3	3	3	3

		Students will be able to develop and evaluate alternate managerial decisions and identify optimal solutions	Students will demonstrate effective application capabilities of their conceptual understanding to the real world business situations	Students will be able to exhibit effective decision making skills, employing analytical and critical thinking ability	Students will demonstrate effective oral and written communication skills in the professional context	Students will able to work effectively in teams and demonstrate team building capabilities	Students will exhibit leadership and networking skills while handling business situations	Students will demonstrate sensitivity towards ethical and moral issues and have ability to address them in the course of business	Students will demonstrate employability traits in line with the changing dynamics of the industry	Students will demonstrate strong conceptual knowledge in the functional area of management as well as LSCM domain	Students will demonstrate effective understanding of relevant functional areas of management and their application in LSCM	Students will demonstrate analytical skills in identification and resolution of business problems pertaining to LSCM & general management	Students will exhibit the ability to integrate functional areas of management with domain perspective for the purpose of planning, implementation & control of LSCM	Students will have global perspective towards business situations in the area of LSCM	Students will exhibit deployable skills pertinent to the LSCM sector
Course Code	Course Title	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 9	PSO 10	PSO 11	PS12	PSO 13	PSO14
MDSL 807	Lean Supply Chain Management	3	3	3	2	2	1	3	3	2	2	3	2	3	3

1 – Weakly mapped
2 – Moderately mapped
3 – Strongly mapped

Model Question Paper

Name: **Enrolment No:**	

Course: MDSL 807 Lean Supply Chain Management

Programme: MBA (Logistics & Supply Chain Management) **Semester: ODD-2016-18**

Time: 03 hrs. **Max. Marks: 100**

Instructions:

Note: All sections are compulsory & this question paper carries 4 sections.

Section A (20)

Attempt all questions in this section

1.	(A) Fill in the blank (a) What is the other name of VSM……...(1) (b) Personality development theory was given by……... (1) (c) In order to implement lean system in any organization what are the two basic changes needed to bring…….. & …… (2) (d) If takt time is 34.3 sec. & OEE is 88% what would be the cycle time? …… (1) (e) Time study is also known as……. (1) (f) Name the waste reduced using the strategy "Establish Pull Demand System"… (1) (g) What is the other name of OTS……. (1) (h) The flow concept has……..&……... (2) (i) DOE stands for…….. (1) (B) Explain the following (a) Heijunka (b) Jidoka (c) SMED	(11 marks) (3*3=9 marks)	CO - 1, 2, 3, 4, 5
	SECTION B (20 Marks) **Attempt any 4 question, each question carries 5 marks only**		
2.	(a) What do you understand by 5s & how it can be used in a University/educational institution? (b) Define (a) little's law (b) model mix leveling? (c) Compare DMAIC vs DMADV? (d) Compare lean principles with TPS principles? (e) Calculate the takt time when a plant runs for two ten hour shifts & each shift include a 30 minute lunch two ten minutes break. The normal work schedule if 5 days per week & have nine holidays in a year. The customer has a contractual agreement to purchase 500,000 units per year.	**(5*4= 20 marks)**	CO 1, 2, 3, ,5
	SECTION C(30 marks) **(Attempt any 3 question, each question carries 10 marks only)**		
3.	(a) Calculate the OEE for 31st March 2015, where a plant runs for two shift of 12 hours each everyday & each shift has a break of 1 hour & 30 min. each for lunch & dinner & tea break. The scheduled preventive maintenance is 30 min. each day. The unscheduled downtime was 1 hour on 31st March 2012. The design cycle time is 30 seconds per piece & the total production was 2050 pieces with 50 rejected pieces on that particular day. Also predict the type of losses using OEE?	[10 x 3]	CO – 1, 2, 4,5

	(b) A projector manufacturing company exports projector, calculate the cycle, buffer & safety stock for the company when their daily shipment is 1400 units per day, assume takt time as 1 minute. The time the Kanban cards are in planning is 24 hours, and the delivery time(due to material handler's frequency) is 3 hours. In any typical queue they have 14 hours of demand in front of the order. Assuming safety factor as 0.03, also the average production is 1400 units for a month & standard deviation is 59.0 & average demand for a month is 1400 units & standard deviation for demand is 208.0. For a 99% on time delivery the acceptable value for one sided test(Z score= 2.33). Also calculate the number of kanban required when the kanban container size is 50 units. (c) Discuss the various diagnostics tools used for Lean strategy implementation? (d) With reference to the article "World class manufacturing", discuss the WCM model & what are the process which integrates wcm with business planning?		
	SECTION D (30 marks) **Read the case & attempt the following question**		
4.	St James's Hospital, affectionately known as 'Jimmy's', is Europe's largest teaching hospital. It employs around 4500 people to support the 90 000 in-patient treatments per year and over 450 000 total admissions. Under increasing pressure to reduce costs, to contain inventory and to improve service, the Supplies Department has recently undertaken a major analysis of its activities, helped by the consultancy division of Lucas Industries, the UK-based manufacturing company. The initial review highlighted that Jimmy's had approximately 1500 suppliers of 15 000 different products at a total cost of £15 million. Traditionally, the Supplies Department ordered what the doctors asked for, with many cases of similar items supplied by six or more firms. Under a cross-functional task force, comprising both medical and supply staff, a major programme of supplier and product rationalization was undertaken, which also revealed many sources of waste. For example, the team found that wards used as many as 20 different types of gloves, some of which were expensive surgeons' gloves costing around £1 per pair, yet in almost all cases these could be replaced by fewer and cheaper (20 pence) alternatives. Similarly, anaesthetic items which were previously bought from six suppliers, were single-sourced. The savings in purchasing costs, inventory costs and general administration were enormous in themselves, but the higher-order volumes also helped the hospital negotiate for lower prices. Suppliers are also much more willing to deliver frequently in smaller quantities when they know that they are the sole supplier. Peter Beeston, the Supplies Manager, said: 'We've been driven by suppliers for years ... they would insist that we could only purchase in thousands, that we would have to wait weeks, or that they would only deliver on Wednesdays! Now, our selected suppliers know that if they perform well, we will assure them of a long-term commitment. I prefer to buy 80 per cent of our requirements from 20 or 30 suppliers, whereas previously, it involved over a hundred.' The streamlining of the admissions process also proved fertile ground for improvement along JIT principles. For example, in the Urology Department, one-third of patients for non-urgent surgery found their appointments were being cancelled. One	[30]	CO-1,2,3,4,5

reason for this was that in the time between the consultant saying that an operation was required and the patient arriving at the operating theatre, there were 59 changes in responsibility for the process. The hospital reorganized the process to form a 'cell' of four people who were given complete responsibility for admissions to Urology. The cell was located next to the ward and made responsible for all record keeping, planning all operations, ensuring that beds were available as needed, and telling the patient when to arrive. As a result, the 59 handovers are now down to 13 and the process is faster, cheaper and more reliable.

Jimmy's also introduced a simple kanban system for some of its local inventory. In Ward 9's storeroom, for example, there are just two boxes of 10 mm syringes on the shelf. When the first is empty, the other is moved forward and the Ward Sister then orders another. The next stage will be to simplify the reordering: empty boxes will be posted outside the store, where codes will be periodically read by the Supplies Department, using a mobile data recorder.

The hospital's management is convinced of the benefits of their changes.

'Value for money, not cost cutting, is what this is all about. We are standardizing on buying quality products and now also have more influence on the buying decision ... from being previously functionally oriented with a number of buyers, we now concentrate on materials management for complete product ranges. The project has been an unmitigated success and although we are only just starting to see the benefits, I would expect savings in cost and in excess inventory to spiral! The report on Sterile Wound Care Packs shows the potential that our team has identified. The 'old' pack consisted of four pairs of plastic forceps, cotton wool balls and a plastic pot, which were used with or without additional gloves. This pack cost approximately 60 pence excluding the gloves. The "new" pack consists of a plastic pot, swabs, etc., and one pair of latex gloves only. This pack costs approximately 33 pence including gloves. Total target saving is approximately £20 000.'

Questions

1. List the elements in St James's new approach which could be seen as deriving from JIT principles of manufacturing. (10 marks)
2. What further ideas from JIT manufacturing do you think could be applied in a hospital setting such as St James's? (15 marks)
3. Suggest a suitable title and theme for the case? (5 marks)