

DEPARTMENT OF PRODUCTION ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	Lean Manufacturing		
Course Code	PRPE36	No. of Credits	3
Course Code of Pre-requisite subject(s)	PRPC22		
Session	Jan. <u>2018</u>	Section (if, applicable)	S
Name of Faculty	Dr S Vinodh	Department	Production Engg
Email	vinodh@nitt.edu	Telephone No.	0431-2503520
Name of Course Coordinator(s) (if, applicable)			
E-mail		Telephone No.	
Course Type	<input type="checkbox"/> Core course	<input checked="" type="checkbox"/> Elective course	
Syllabus (approved in BoS)			
<p>Objectives of lean manufacturing-key principles and implications of lean manufacturing-traditional Vs lean manufacturing. Value creation and waste elimination- main kinds of waste-pull production-different models of pull production-continuous flow-continuous improvement/Kaizen- worker involvement -cellular layout- administrative lean.</p> <p>Standard work -communication of standard work to employees -standard work and flexibility - visual controls-quality at the source- 5S principles -preventative maintenance-total quality management-total productive maintenance -changeover/setup time -batch size reduction - production levelling.</p> <p>Value Stream Mapping-The as-is diagram-the future state map-application to the factory simulation scenario-line balancing -Poke Yoke – overall equipment effectiveness. One Piece Flow-Process razing techniques – cells for assembly line – case studies</p> <p>Introduction - elements of JIT - uniform production rate - pull versus push method- Kanban system - small lot size - quick, inexpensive set-up - continuous improvement. Optimised production technology.</p> <p>Team establishment, transformation process, Project Management, Lean implementation, Reconciling lean with other systems- lean six sigma-lean and ERP-lean with ISO 9001:2000.</p>			

COURSE OBJECTIVES	
1.	This course aims at enabling the students to recognize the principles and concepts of lean manufacturing
2.	This course provides practical insights to students on the tools/techniques of lean manufacturing
3.	This course provides hands on experience for application of lean concepts
COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
1. Competence to recognize and eliminate waste	1,2,5,9
2. Understand and apply appropriate lean tools/techniques	1,2,5,7,9,11
3. Recognize applications of lean concepts in various domains	1,2,5,6,7,9,11,12

COURSE PLAN – PART II			
COURSE OVERVIEW			
<p>This course aims at addressing the transition of manufacturing systems, objectives of lean manufacturing, comparison of mass and lean manufacturing, principles of lean manufacturing. Both primary and secondary tools/techniques of lean manufacturing will be discussed in detail with appropriate illustration. Rules governing lean manufacturing, training and implementation for lean manufacturing and success factors of lean manufacturing will be discussed. Importance of lean concepts in service sectors, lean integration with Six Sigma, ERP and ISO systems also will be discussed.</p>			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/ Contact Hours	Topic	Mode of Delivery
1	1	Objectives of Lean Manufacturing	C&T
2	1	Key principles and implications of Lean manufacturing	PPT
3	2	Traditional Vs Lean Manufacturing	PPT
4	2	Value creation and waste elimination	C&T
5	2	Main kinds of waste, Pull Production	PPT
6	3	Different models of pull production	C&T
7	3	Continuous flow, continuous improvement/kaizen	C&T

8	3	Worker involvement	PPT
9	4	Cellular layout, Administrative Lean	PPT
10	4	Standard work, communication of standard work to employees	PPT, C&T
11	4	Standard work and flexibility, Visual controls	PPT, C&T
12	5	Quality at the source, 5S Principles	PPT
13	5	Preventative Maintenance, Total Quality Management	PPT
14	5	Total Productive Maintenance; Changeover/Setup Time, Batch size reduction	PPT
15	6	Production Levelling	PPT
16,17	6	Value Stream Mapping – The As-Is diagram	C&T
18, 19	7	Future State Map, Examples	C&T
20	7	Assignment/Tutorial I	Tutorial
21	8	Application to the factory simulation, Line Balancing	PPT
22, 23	9	Poka Yoke, Overall Equipment Effectiveness	PPT
24, 25	10	One Piece Flow, Process Razing techniques, Cells for assembly line	PPT
26, 27	11	Case studies on lean manufacturing	PPT
28	11	Elements of JIT, Uniform production rate	PPT
29	12	Pull vs push method, Kanban system	PPT
30	13	Small lot size, quick inexpensive setup	PPT
31	14	Continuous improvement, Optimized production technology	C&T
32	14	Team Establishment, Transformation process	C&T
33	14	Project management, Lean implementation, Reconciling lean with other systems	PPT

34	15	Lean Six Sigma, Lean and ERP, Lean with ISO 9001:2000	PPT
35	15	Assignment/Tutorial II	Tutorial

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test I	6	1 Hour	20
2	Cycle Test II	10	1 Hour	20
3	Assignments/Tutorials/Quizzes /Activity/Seminar presentation	7,15	1 Hour	20
CPA	Compensation Assessment*	14	1 Hour	20
4	Final Assessment *	15	2 Hours	40

*mandatory; refer to guidelines on page 4

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

At the end of the semester students will give feedback online (MIS) as well feedback will be gathered during class committee meetings. Also, mid semester feedback will be obtained through questionnaire.

COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)

MODE OF CORRESPONDENCE (email/ phone etc)

Students can interact with faculty during class hours and also via email.

ATTENDANCE

- Attendance will be taken by the faculty in all the contact hours. All the students are expected to attend all the contact hours.
- Every student should maintain minimum 75% attendance in these contact hours.
- Any student, who fails to maintain 75% attendance need to score more than 50% marks in the assessments 1 to 4 (in total) for attending the final assessment. Students fail to satisfy this criteria will have to REDO the course
- However students fail to maintain 50% attendance will have to REDO the course.

COMPENSATION ASSESSMENT

1. Attending all the assessments are MANDATORY for every student.
2. One compensation assessment (CPA) will be conducted for those students who are being physically absent for the assessment 1 and 2.
3. At any case, CPA will not be considered as an improvement test.
4. Relative grading will be adopted for the course.

ACADEMIC HONESTY & PLAGIARISM

1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using material in any form (paper, mobile phone etc.,) for copying during any assessments is considered dishonest.
2. Tendering of information such as giving one's program, simulation work, assignments to another student to use or copy is also considered dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD of the concerned department.

ADDITIONAL INFORMATION

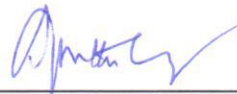
FOR APPROVAL

Course Faculty



11.1.2018

CC-Chairperson



HOD

