

Course Code	<b>MB180M08</b>	Course Name	<b>MANAGEMENT OF MANUFACTURING SYSTEMS</b>	Course Category		Foundation Course	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
							<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>

Pre-requisite Courses		Co-requisite Courses		Progressive Courses	Operations management
Course Offering Department				Data Book / Codes/Standards	

<b>Course Learning Rationale (CLR):</b>	The purpose of learning this course is to:	<b>Learning</b>			<b>Program Learning Outcomes (PLO)</b>							
<b>CLR-1:</b>	Provide knowledge to understand the concepts of general manufacturing systems	1	2	3	1	2	3	4	5	6	7	8
<b>CLR-2:</b>	Examine more insights on cellular manufacturing systems	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Business Environment & Domain Knowledge (BEDK)	Critical Thinking, Business Analysis, Problem Solving and Innovative Solutions (CBPI)	Global Exposure and Cross-cultured understanding (GECCU)	Social Responsiveness and Ethics (SRE)	Effective Communication (EC)	Leadership and team work (LT)	PSO - 1	PSO - 2
<b>CLR-3:</b>	Inculcate the habit of practicing Just-in-Time and Kanban conceptual ideas and familiar about the same											
<b>CLR-4:</b>	Expose various Theory of Constraints											
<b>CLR-5:</b>	Offer insights on performance measurement of manufacturing systems											
<b>Course Learning Outcomes (CLO):</b>	At the end of this course, learners will be able to:											
<b>CLO-1:</b>	Identify relevant methods of different manufacturing systems	2	70	70	H	M	H	M	L	M	M	L
<b>CLO-2:</b>	Understand the process planning and techniques to improve the Layout Planning	2	60	70	L	H	L	L	M	M	M	H
<b>CLO-3:</b>	Understanding the different methods to improve Group Technology	1	80	75	M	H	L	L	M	M	L	M
<b>CLO-4:</b>	Explore effective methods of manufacturing to be more effective and efficient	2	90	70	M	H	M	L	M	M	L	H
<b>CLO-5:</b>	Analyze the performance measurement of manufacturing system	3	80	80	M	H	H	L	M	M	L	L

Duration (hour)	<b>8</b>		<b>8</b>		<b>8</b>		<b>8</b>		<b>8</b>	
<b>S-1</b>	SLO-1	Manufacturing systems - Introduction	Process mapping -Introduction	Types of Manufacturing system	Definition , scope	Comparison between different types				
	SLO-2	Advantages, Disadvantages, of manufacturing systems	The Nature of Manufacturing management	Functions of Manufacturing system	Functions of Manufacturing managers	Manufacturing concept				
<b>S-2</b>	SLO-1	Manufacturing concept planning	Process planning- introduction	Methods of planning	Elements of Process planning	Advantages of Process planning				
	SLO-2	Requirements of good Manufacturing system	Assembling lines and requirements	Layout planning	Analysis of Layout planning	Case study				
<b>S-3</b>	SLO-1	Group Technology - Introduction	Cellular Manufacturing	Scope and application	Methods of GT	Advantages of GT				
	SLO-2	Formation of Cells	Formation of Manufacturing cells	Formation of Assembly lines	Methods of Formation	Production flow analysis				
<b>S-4</b>	SLO-1	Layout – meaning and need	Types of Layout	Comparison of Layouts	Layout design	Operator allocation				
	SLO-2	Operator allocation - Introduction	Meaning, scope and need	methods	advantages	Case study				
<b>S-5</b>	SLO-1	Sequencing - Introduction	Meaning, need and scope	Sequencing methods	Importance	Examples				

	SLO-2	Scheduling	Importance	Johnson's problem	Johnson's problem	Johnson's problem
<b>S-6</b>	SLO-1	Just - In -Time - Definition	Need of JIT	Advantages	JIT system	JIT Principles
	SLO-2	Seven wastes in JIT	Elements	Design aspects of JIT	Improvement of JIT system	Case study
<b>S-7</b>	SLO-1	Kanban - Introduction	Definition and Need	Types of Kanban	Single card Kanban	Two card Kanban
	SLO-2	Push concept of Kanban	Pull concept of Kanban	Constant work in Process	Concepts of CONWIP	Comparison – Kanban & CONWIP
<b>S-8</b>	SLO-1	Synchronous Manufacturing	Theory of constraints	Operation planning	Control based on Theory of Constraints	Advantages
	SLO-2	Performance measure	Definition, need and scope	Constraints	DBR methodology	Importance
<b>S-9</b>	SLO-1	Flexible Manufacturing systems	Meaning and scope	Objectives of FMS	Components	FMS application
	SLO-2	Conceptual models	FMS models	Applications	Case study	Case Study

<b>Learning Resources</b>	1. Shahrukh A. Irani, Handbook of Cellular Manufacturing Systems, John Wiley and Sons Inc., 1999	<a href="https://www.civildatabase.com/subject/Management/notes/process-planning.html">https://www.civildatabase.com/subject/Management/notes/process-planning.html</a>
	2. T.C. Cheng, S. Podolsky, Just-in-Time Manufacturing: An introduction, Second edition, Chapman and Hall Publications, 1996	<a href="https://www.greatsamples.com/job-responsibilities/manufacturing-manager-responsibilities/">https://www.greatsamples.com/job-responsibilities/manufacturing-manager-responsibilities/</a>
	3. Mahadevan B., Operations Management Theory and Practice, Pearson Publication, 3rd Edition, 2015	<a href="https://www.referenceforbusiness.com/management/Bun-Comp/Cellular-Manufacturing.html">https://www.referenceforbusiness.com/management/Bun-Comp/Cellular-Manufacturing.html</a>
	4. R. Panneerselvam, Production & operations management, Prentice Hall India private limited, 2017.	<a href="https://www.ifm.eng.cam.ac.uk/research/dstools/jit-just-in-time-manufacturing/">https://www.ifm.eng.cam.ac.uk/research/dstools/jit-just-in-time-manufacturing/</a>
	5. Aswathappa, K., ShridharaBhat, K., Production and Operations Management , Himalaya Publishing House, 2014	<a href="https://hbr.org/1985/09/mrp-jit-opt-fms">https://hbr.org/1985/09/mrp-jit-opt-fms</a> <a href="https://www.digite.com/kanban/what-is-kanban/">https://www.digite.com/kanban/what-is-kanban/</a> <a href="https://www.synchronix.com/theory-of-constraints-toc/toc-applications/synchronous-manufacturing/synchronous_manufacturing.htm">https://www.synchronix.com/theory-of-constraints-toc/toc-applications/synchronous-manufacturing/synchronous_manufacturing.htm</a> <a href="https://www.iare.ac.in/sites/default/files/IARE_FMS_LN.pdf">https://www.iare.ac.in/sites/default/files/IARE_FMS_LN.pdf</a>

<b>Learning Assessment</b>											
	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (15%)		CLA – 3 (15%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember Understand	20	10	25	5	30	0	35	5	30	0
Level 2	Apply Analyze	30	10	35	5	40	0	30	0	40	0
Level 3	Evaluate Create	20	10	25	5	30	0	30	0	30	0
	Total	100 %		100 %		100 %		100 %		100 %	

# CLA – 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, and Conf. Paper etc.

<b>Course Designers</b>		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
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