

FLEXIBLE MANUFACTURING SYSTEMS

III Semester: CAD/CAM								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BCCB23	Elective	L	T	P	C	CIA	SEE	Total
		3	-	-	3	30	70	100
Contact Classes: 45		Tutorial Classes: Nil		Practical Classes: Nil			Total Classes: 45	
<p>OBJECTIVES:</p> <p>The course should enable the students to:</p> <ol style="list-style-type: none"> I. Understanding of modern trends in design and manufacturing using CAD/CAM. II. Apply performance analysis techniques. III. Understand preventive maintenance procedures in manufacturing. <p>COURSE LEARNING OUTCOMES (CLOs):</p> <ol style="list-style-type: none"> 1. Understand the basic concepts of FMS. 2. Apply the concept of system design procedures to different levels of production. 3. Identify the system modeling issues and control them. 4. Apply the concept of scheduling. 5. Understand and Apply system model techniques. 6. Distinguish between continuous and discrete modeling techniques. 7. Design models of manufacturing systems. 8. Analysis of performance of manufacturing system. 9. Understand the preventative maintenance. 10. Understand the basic concepts of FMS. 11. Apply the concept of system design procedures to different levels of production. 12. Identify the system modeling issues and control them. 13. Understand and apply system modeling techniques. 14. Distinguish between continuous and discrete modeling techniques 15. Design models of manufacturing systems 								
UNIT-I	FLEXIBLE MANUFACTURING SYSTEMS:						Classes:09	
<p>Introduction: Definitions of manufacturing with input-output model, definition of system, basic problems concerning systems and system design procedure, modes of manufacturing – job/batch/flow and multi-product, small batch manufacturing.</p>								

UNIT -II	SYSTEM MODELING ISSUES	Classes:09
System modeling issues: Centralized versus distributed control; Real-time vs discrete event control; Forward vs. backward scheduling approaches with finite/infinite capacity loading; Modeling of absorbing states and deadlocks; Conflicts; Concurrency, and synchronization		
UNIT -III	SYSTEM MODELING TOOLS AND TECHNIQUES	Classes:09
System Modeling Tools and Techniques: Introduction to mathematical modeling, optimization, and simulation; issues related with deterministic and stochastic models. Continuous and discrete mathematical modeling methods -discrete event, monte carlo method; Basic concepts of Markov chains and processes; The M/M/1 and M/M/m queue; Models of manufacturing systems including transfer lines and flexible manufacturing systems, introduction to Petri nets.		
UNIT -IV	PERFORMANCE ANALYSIS	Classes:09
Performance Analysis: Transient analysis of manufacturing systems, analysis		
UNIT -V	PREVENTIVE MAINTAINANCE	Classes:09
Preventive maintenance, Kanban system, implementation issues		
Text Books:		
<ol style="list-style-type: none"> 1. N. K. Jha, "Hand Book of Flexible Manufacturing Systems", Academic Press, 1st Edition, 2013. 2. Talichi Ohno, "Production System beyond Large Scale Production", Toyota Productivity Press India Pvt. Ltd, 1st Edition, 2010. 3. H K Shivanand, "Flexible Manufacturing Systems", New Age International, 1st Edition, 2006. 		
Reference Books:		
<ol style="list-style-type: none"> 1. Farid Amirouche, "Principles of Computer-Aided Design and Manufacturing", 2nd Edition, 2004. 2. P. Radha Krishnan, "CAD/ CAM/ CIM", New Age International, 4th Edition, 2016. 		
Web References:		
<ol style="list-style-type: none"> 1. http://www.ignou.ac.in/upload/UNIT6-55.pdf 2. http://www.journals.elsevier.com/computer-aided-design 3. https://www.elsevier.com/books/surface-modeling-for-cad-cam/choi/978-0-444-88482-4 		
E-Text Books:		
<ol style="list-style-type: none"> 1. http://engineeringstudymaterial.net/ebook/flexible-manufacturing-system/ 2. http://www.sciencedirect.com/science/book/978012385310 		