

COURSE NO : CIM 515

COURSE TITLE : MANUFACTURING SUPPORT SYSTEMS

COURSE COORDINATOR : G.YEDUKONDALU

PROGRAMME DESCRIPTION:

Computer Integrated Manufacturing (CIM) is the integration of the total manufacturing enterprise through the use of integrated systems and data communication coupled with new managerial philosophies that improve organizational and personal efficiencies. The program integrates the basic product design techniques and manufacturing fundamentals and principles that support CIM. This will provide a basic knowledge for implementing CIM so that the enterprise will be competitive in the global market. By the end of the program the student will evaluate different types of manufacturing systems, description of automated machines and software solutions, the impact of CIM on all the major elements in an enterprise such as Product design, shop floor technology and manufacturing production and operational control systems.

PROGRAMME OBJECTIVES:

- 1. Preparation:** To prepare students to excel in M.Tech (CIM) programme and to succeed in manufacturing industry / technical profession through computer integrated manufacturing.
- 2. Core Competence:** To provide students with a solid foundation in basic design techniques, manufacturing and software solutions fundamentals required to solve manufacturing problems.
- 3. Breadth:** To train students with good scientific and engineering breadth so as to comprehend, analyze, design products and solutions for the real world problems in the manufacturing industry.
- 4. Professionalism:** To inculcate in professional and ethical attitude, the students, effective communication skills, team work skills, multidisciplinary approach, and an ability to relate engineering issues to a broader social context.

5. Learning Environment: To provide students with an academic environment aware of excellence, leadership, written ethical codes and guide lines, and the lifelong learning needed for a successful professional career.

PROGRAMME OUTCOMES:

- a)** The student will demonstrate knowledge in manufacturing systems, design attributes for manufacturing, process planning, computer applications for manufacturing, quality concepts required in manufacturing, sensory information to be processed as signals in manufacturing.
- b)** The student will demonstrate an ability to identify, formulate and solve manufacturing problem by using CIM.
- c)** The student will demonstrate an ability to design for manufacturing, conducting experiments in manufacturing, analyze and interpret data.
- d)** The student will demonstrate an ability to design basic components and manufacturing systems.
- e)** The student will demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks.
- f)** The student will demonstrate skills to use modern engineering tools, softwares and equipment to analyze problem in manufacturing.
- g)** The student will demonstrate a knowledge of professional and ethical responsibilities.
- h)** The student will be able to communicate effectively in both verbal and written form.
- i)** The student will show the understanding of impact of engineering solutions on the society and also will be aware of contemporary issues.
- j)** The student will develop confidence for self education and ability for life-long learning.
- k)** The student will be equipped to participate and succeed in research activities.

The relation between the Computer Integrated Manufacturing programme outcomes and the programme objectives.

		Programme Outcomes										
		a	b	c	d	e	f	g	h	i	j	k
Programme Objectives	1	x	x	x	x	x						x
	2		x	x	x		x					x
	3				x			x				
	4	x				x			x			
	5									x	x	x

1. COURSE DESCRIPTION:

This course introduces the students to manufacturing systems engineering with two areas of emphasis: Flow of Materials & Flow of Information. It deals with the various systems for manufacturing.

Manufacturing Systems Includes Process Systems (i.e. Planning and Design); Management Systems (i.e. Planning and Implementation); Information Systems and Global Manufacturing.

Learn how to design, analyze, planning and control manufacturing systems for efficient manufacturing.

2. COURSE OBJECTIVES:

- At end of the course using CIM. The students should identify the ways to make the systems of manufacturing efficient, effective utilization of the facilities in the organization.
- The student should identify & evaluate different types of systems, processes, layouts and implement those processes to organizations for optimization.
- The student is introduced to the manufacturing systems at the design level and monitored through the total manufacturing cycle.
- The student should be able to apply the concepts of manufacturing systems in learning latest manufacturing industries and be able to employ their knowledge to evaluate manufacturing systems and solve manufacturing problems.

- The student should be prepared to continue the study of the recognize economy (flow of cost) for manufacturing; i.e. cost engineering/management and profit planning, Industrial structure and input – output analysis, proposing 'manufacturing excellence' for future production perspectives (flow of value).

The relation between the Manufacturing Support Systems course objectives and the Programme outcomes.

		Programme Outcomes										
		a	b	c	d	e	f	g	h	i	j	k
Course Objectives	1	x	x	x	x							x
	2		x	x		x						x
	3				x			x				
	4	x				x						
	5						x		x	x	x	

3. SYLLABUS:

UNIT I

Essentials of Manufacturing Systems:

Fundamentals of Manufacturing, Fundamentals of Systems, Fundamentals of Manufacturing Systems, Integrated manufacturing and Management Systems.

UNIT II

Process Systems for Manufacturing:

Material and Technological Information Flows in Manufacturing Systems, Product Planning and Design, Process Planning and Design, Layout Planning and Design, Logistic Planning and Design, Manufacturing Optimization.

UNIT III

Management Systems for Manufacturing:

Managerial Information Flow in Manufacturing Systems, Aggregate Production Planning, Production Scheduling.

UNIT IV

Information Systems for Manufacturing:

Fundamentals of Information Technology, Parts-oriented Production Information systems, Computerized Production Scheduling, On-line Production Control Systems, Computer-based Production Management Systems.

UNIT V

Global Manufacturing:

Movement towards globalization, International Production, Export and import of industrial products.

TEXT BOOKS:

1. Katsundo Hitomi "Manufacturing Systems Engineering" 1st Edition, Viva Books, New Delhi, 1998.

REFERENCE BOOKS:

1. Mikel P. Groover "Automation, Production Systems and Computer Integrated Manufacturing" 2nd Edition, PHI, New Delhi.

UNIT RATIONALE:

UNIT-I: The purpose of this unit is to enable the students to understand the concept of Manufacturing systems and their structure. Students should analyze how the Manufacturing Systems work.

After the successful completion of this unit, students should be able to apply system analysis (particularly the 'Flow of materials') for manufacturing in order to produce high quality products.

UNIT-II: The purpose of this unit is to enable the students to understand the concept of Process Systems for Manufacturing.

After the successful completion of this unit, students should be able to apply systems design (particularly the 'Flow of materials') for manufacturing in order to produce products within the required time.

UNIT-III: The purpose of this unit is to enable the students to understand the concept of Management Systems for Manufacturing.

After the successful completion of this unit, students apply, optimize planning and implementation for manufacturing optimization.

UNIT-IV: The purpose of this unit is to enable the students to understand the concept of Information Systems for Manufacturing.

After the successful completion of this unit, students should apply the information technology for manufacturing in order to produce more products than the conventional method.

UNIT-V: The purpose of this unit is to enable the students to understand the concept of Global Manufacturing.

After the successful completion of this unit, students should apply global manufacturing for future production perspectives.

4. UNIT PLAN:

	Unit - I	Unit - II	Unit - III	Unit - IV	Unit - V
Title	Essentials of Manufacturing Systems	Process Systems for Manufacturing	Management Systems for Manufacturing	Information Systems for Manufacturing	Global Manufacturing
Duration (in hours)	10	10	10	10	5
Session 1	Introduction of Manufacturing Systems (T1)	Introduction of Process Systems for Manufacturing (T1_Ch6)	Introduction of Management Systems for Manufacturing (T1_Ch12)	Introduction of Information Systems for Manufacturing (T1_Ch26)	Introduction of Global Manufacturing (T1_Ch33)
Session 2	Fundamentals of Manufacturing (T1_Ch1)	Material and Technological Information Flows in Manufacturing Systems (T1_Ch6)	Managerial Information Flow in Manufacturing Systems (T1_Ch12)	Fundamentals of Information Technology (T1_Ch26)	Movement towards Globalization (T1_Ch33)
Session 3	Fundamentals of Manufacturing (T1_Ch1)	Product Planning and Design (T1_Ch7)	Managerial Information Flow in Manufacturing Systems (T1_Ch12)	Fundamentals of Information Technology (T1_Ch26)	International Production (T1_Ch33)
Session 4	Fundamentals of Systems (T1_Ch2)	Product Planning and Design (T1_Ch7)	Aggregate Production Planning (T1_Ch13)	Parts-oriented Production Information systems (T1_Ch27)	Export and import of industrial products (T1_Ch33)
Session 5	Fundamentals of Systems (T1_Ch2)	Process Planning and Design (T1_Ch8)	Aggregate Production Planning (T1_Ch13)	Parts-oriented Production Information systems (T1_Ch27)	

Session 6	Fundamentals of Manufacturing Systems (T1_Ch3)	Process Planning and Design (T1_Ch8)	Aggregate Production Planning (T1_Ch13)	Computerized Production Scheduling (T1_Ch28)	
Session 7	Fundamentals of Manufacturing Systems (T1_Ch3)	Layout Planning and Design (T1_Ch9)	Aggregate Production Planning (T1_Ch13)	Computerized Production Scheduling (T1_Ch28)	
Session 8	Fundamentals of Manufacturing Systems (T1_Ch3)	Layout Planning and Design (T1_Ch9)	Production Scheduling (T1_Ch14)	On-line Production Control Systems (T1_Ch29)	
Session 9	Integrated manufacturing and Management Systems (T1_Ch5)	Logistic Planning and Design (T1_Ch10)	Production Scheduling (T1_Ch14)	On-line Production Control Systems (T1_Ch29)	
Session 10	Integrated manufacturing and Management Systems (T1_Ch5)	Manufacturing Optimization (T1_Ch11)	Production Scheduling (T1_Ch14)	Computer-based Production Management Systems (T1_Ch30)	

5. SESSION PLAN: UNIT- I

Learning Objective: At the end of the session the student will understand the concept of Manufacturing Systems (Session 1)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Manufacturing	Innovative introduction	Explanation	Comprehends	The students apply the manufacturing techniques for the production of tangible goods.
15 min	Transition of Production Mode	Chalk and Talk	Explanation	Observation	
10 min	Why is Manufacturing Important?	Talk	Explanation	Answers	
5 min	Advantages/ Disadvantage	Brainstorming	Facilitating	Participation	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will examine the concept of Fundamentals of Manufacturing (Session 2)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Principles of Manufacturing	Drawing	Explanation	Watching & Listening	The student identifies different manufacturing activities
10 min	Resources of Production – Inputs for production	Chalk and Talk	Explanation	Observation	
10 min	Classification for Resources of Production	Chalk and Talk	Explanation	Listening	

15 min	Resources of Production for Manufacturing Systems	Chalk and Talk	Explanation	Listening	
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Learning Objective: At the end of the session the student will examine the concept of Fundamentals of Manufacturing (Session 3)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Outputs of production	Chalk and Talk	Explanation	Listening	The student performs successively on workstations in particular that raw material into tangible goods.
15 min	Production Processes – Transformation of Inputs to Outputs	Chalk and Talk	Explanation	Observation	
15 min	Production Organization	Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session, the student should design the Fundamentals of systems (Session 4)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Basic concepts of Systems	Chalk and Talk	Explanation	Listening	The student solves effectively manufacturing issues.
10 min	Characteristics of systems	Chalk and Talk	Explanation	Comprehends	
10 min	Basic Attributes of the system	Chalk and Talk	Explanation	Listening	
15 min	Systems Defined	Drawing and Talk	Explanation	Watching & Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session, the student should design the Fundamentals of systems (Session 5)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Systems Design	Drawing and Talk	Facilitating	Watching & Listening	The student constructs a new, useful system.
15 min	Model Building	Chalk and Talk	Explanation	Listening	
15 min	Decision – Making Procedures	Chalk and Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will implement the concept of Fundamentals of Manufacturing Systems (Session 6)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Manufacturing Systems	Chalk and Talk	Explanation	Listening	The student organizes of production with a series of activities.
30min	Three Aspects of Manufacturing Systems	Chalk and Talk	Explanation	Comprehends	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will implement the concept of Fundamentals of Manufacturing Systems (Session 7)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Role of Management in Mfg Industry	Chalk and Talk	Explanation	Listening	The student should be able to arrange organization with management for production.
20 min	Procedure of Production Management	Drawing, Chalk and Talk	Explanation	Watching & Listening	
10 min	Kinds of Information Flow	Chalk and Talk	Explanation	Listening	
10 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session, the student should design the concept of Fundamentals of Manufacturing Systems (Session 8)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Integrated Manufacturing Systems	Chalk and Talk	Explanation	Listening	The student plan for producing the required products and delivering them at the right time.
15 min	Microscopic Aspect of Mechanical Production	Chalk and Talk	Explanation	Observation	
15 min	Manufacturing Systems Engineering	Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will examine the concept of Integrated manufacturing and Management Systems (Session 9)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Basic Functions of Management Systems	Drawing, Chalk and Talk	Explanation	Watching & Listening	The student arranges organization by utilizing production resources.
15 min	Structure Management Systems	Chalk and Talk	Explanation	Comprehends	
15 min	Functional Structure of the Management Systems	Chalk and Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will examine the concept of Integrated manufacturing and Management Systems (Session 10)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
25min	Basic Framework of Integrated Manufacturing Management Systems	Drawing and Talk	Facilitating	Watching & Listening	The student proposes effective operation and managerial work.
20 min	Framework of an Integrated Manufacturing Systems	Drawing, Chalk and Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

UNIT- II Session Plan

Learning Objective: At the end of the session the student will acquire the concept of Process Systems for Manufacturing (Session 1)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Introduction	Innovative introduction	Explanation	Comprehends	The student plan of Process Systems for Manufacturing
15 min	Material and Technological Information Flows	Chalk and Talk	Explanation	Observation	
15 min	What is the need of process systems?	Brainstorming	Facilitating	Participation	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will analyze concept of Material and Technological Information Flows in Manufacturing Systems (Session 2)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Logistic Systems	Chalk and Talk	Explanation	Listening	The student designs the material flow inside a factory.
10 min	Material Flow	Drawing, Chalk and Talk	Explanation	Watching & Listening	
10 min	Types of Operation	Chalk and Talk	Explanation	Listening	
10 min	Technological Information Flow	Chalk and Talk	Explanation	Listening	

5 min	Summary / Q&A	Oral	Quiz Master	Participation	
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Learning Objective: At the end of the session the student will analyze the concept of Product Planning and Design (Session 3)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10 min	Product Planning	Chalk and Talk	Explanation	Listening	The student constructs new material goods that meet the market needs.
15 min	Planning Systems for a new product	Drawing, Chalk and Talk	Explanation	Watching & Listening	
10 min	Product Design	Talk	Explanation	Listening	
10 min	Product Quality	Chalk & Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will plan the concept of Product Planning and Design (Session 4)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Structure of Product	Drawing, Chalk and Talk	Explanation	Watching & Listening	The student designs of hierarchical product structure for different products
15 min	Bill of Material	Chalk and Talk	Explanation	Watching & Listening	
15 min	Problem	Case study	Observes	Analyses	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will analyze the concept of Process Planning and Design (Session 5)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Process Planning	Talk	Explanation	Listening	The student write a sequence of production operations through which raw materials are effectively converted into planned products
10 min	Basic Functions of Process Planning	Chalk and Talk	Explanation	Listening	
15 min	Product Design	Chalk and Talk	Explanation	Listening	
10 min	Selection of Workstation	Drawing, Chalk and Talk	Explanation	Watching & Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will perform concept of Process Planning and Design (Session 6)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Operation Design	Chalk and Talk	Explanation	Listening	1. The student calculates time required to do each operation. 2. The student plan process route for optimum process planning.
10 min	1. Methods of Time Study/Work Measurement	Chalk and Talk	Explanation	Comprehends	
10 min	2. Optimum Routing Analysis	Drawing, Chalk and Talk	Explanation	Watching & Listening	
15 min	Solving by Dynamic Programming	Case study	Observes	Analyses	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will analyze the concept of Layout Planning and Design (Session 7)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Layout Planning	Chalk and Talk	Explanation	Listening	The student designs of layouts for production plants.
10 min	Aims of Layout Planning	Chalk and Talk	Explanation	Listening	
10 min	Fundamental Patterns of Plant Layout	Drawing, Chalk and Talk	Explanation	Watching & Listening	
10 min	Plant Layout Design	Chalk and Talk	Explanation	Listening	
10 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will design the concept of Layout Planning and Design (Session 8)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Systematic Layout Planning (SLP)	Drawing, Chalk and Talk	Explanation	Watching & Listening	The student prepares an appropriate best layout plan.
15 min	Mathematical Layout Design	Chalk and Talk	Explanation	Observation	
15 min	Production Flow Analysis	Case Study	Facilitates	Participation	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will solve the concept of Logistic Planning and Design (Session 9)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Transportation Problems	Chalk and Talk	Explanation	Listening	The student analyze of raw materials at various workstations
15 min	Transportation Algorithm	Chalk and Talk	Explanation	Comprehends	
15 min	Problems	Case Study	Facilitates	Participation	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will formulate concept of Manufacturing Optimization (Session 10)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Manufacturing Optimization	Talk	Facilitating	Listening	The student construct organization for optimization (part machining)
15 min	Decision Variables for MO	Chalk and Talk	Explanation	Listening	
15 min	Basic Factors in Machining Operation	Chalk and Talk	Explanation	Comprehends	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

UNIT- III Session Plan

Learning Objective: At the end of the session the student will plan the concept of Management Systems for Manufacturing (Session 1)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Management	Innovative introduction	Explanation	Comprehends	The student plan management systems for manufacturing
10 min	Management Systems for Manufacturing	Chalk and Talk	Explanation	Observation	
15 min	What is the need of Management in Mfg?	Brainstorming	Facilitating	Participation	
10 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will examine Concept of Managerial Information Flow in Manufacturing Systems (Session 2)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Information Flow in Mfg	Chalk and Talk	Explanation	Listening	The student plan organization for real time basis with the use of computer facilities
15 min	Information-Flow Process	Chalk and Talk	Explanation	Listening	
15 min	Mfg Information Systems	Chalk and Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will examine Concept of Managerial Information Flow in Manufacturing Systems (Session 3)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10 min	Issues in Strategic Production Planning	Chalk and Talk	Explanation	Listening	The student select information flow an action realizes high quality, low costs and quick response delivery
15 min	Decision Problems in Production Planning	Chalk and Talk	Explanation	Listening	
10 min	Decision Problems in Production Scheduling	Talk	Explanation	Listening	
10 min	Decision Problems in Production Control	Chalk & Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will analyze the concept of Aggregate Production Planning (Session 4)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Short and Long term Production Planning (SPP & LPP)	Chalk and Talk	Explanation	Listening	The student prepares production planning in a specified time period.
15 min	Linear Programming for SPP	Chalk and Talk	Explanation	Watching & Listening	
15 min	Simplex Method Problems	Case study	Observes	Analyses	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will solve the concept of Aggregate Production Planning (Session 5)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
20min	Duality in Linear Program	Case study	Observes	Analyses	The student calculate real time situation in to scientific mathematical models and to generate acceptable conclusions
20 min	Two Phase Method in LP	Case study	Observes	Analyses	
10 min	Product Mix Analysis	Chalk and Talk	Explanation	Listening	

Learning Objective: At the end of the session the student will plan the concept of Aggregate Production Planning (Session 6)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Material Requirements Planning (MRP)	Chalk and Talk	Explanation	Listening	The student plan the MRP for better quality products
15 min	The General Procedure of MRP	Drawing, Chalk and Talk	Explanation	Watching & Listening	
15 min	Capacity Requirements Planning (CRP)	Drawing, Chalk and Talk	Explanation	Watching & Listening	
10 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will plan the concept of Aggregate Production Planning (Session 7)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Long Term Production Planning	Chalk and Talk	Explanation	Listening	The student plans the production for a long term so as to minimize the total production cost.
20 min	LTPP Problems	Case study	Observes	Analyses	
15 min	Production Forecasting	Chalk and Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will analyze the concept of Production Scheduling (Session 8)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10 min	Production Scheduling	Chalk and Talk	Explanation	Listening	The student arranges the machines for proper utilization.
10 min	Operation Scheduling	Chalk and Talk	Explanation	Observation	
5 min	Types of Operation Scheduling	Chalk and Talk	Explanation	Observation	
10 min	Basic Structure of Operation Scheduling	Drawing, Chalk and Talk	Explanation	Watching & Listening	
15 min	Single Machine Scheduling – Job Sequencing	Case study	Observes	Analyses	

Learning Objective: At the end of the session the student will plan the concept of Production Scheduling (Session 9)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
5min	Flow Shop Scheduling	Chalk and Talk	Explanation	Listening	The student arranges the machines for proper utilization.
15 min	Two stage Flow shop Scheduling	Case Study	Facilitates	Participation	
15 min	Three Stage Flow shop Scheduling	Case Study	Facilitates	Participation	
15 min	Two job, job-shop scheduling	Case Study	Facilitates	Participation	

Learning Objective: At the end of the session the student will analyze the concept of Production Scheduling (Session 10)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Two machine Job-Shop scheduling	Talk	Facilitating	Listening	The student manages the organization for performing activities. (required times and costs)
10 min	Project Scheduling	Chalk and Talk	Explanation	Listening	
15 min	PERT	Chalk and Talk	Explanation	Comprehends	
10 min	CPM	Chalk and Talk	Explanation	Comprehends	

UNIT- IV Session Plan

Learning Objective: At the end of the session the student will introduce the concept of Information Systems for Manufacturing (Session 1)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Introduction	Innovative introduction	Explanation	Comprehends	The student apply the information systems on mfg to increase production rate
15 min	Information Systems	Chalk and Talk	Explanation	Observation	
15 min	What is the need of Information systems for Mfg?	Brainstorming	Facilitating	Participation	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will observe the concept of Fundamentals of Information Technology (Session 2)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Role of Information in Mfg	Chalk and Talk	Explanation	Listening	The student manages the material flow and information flow.
10 min	Characteristics of Information	Chalk and Talk	Explanation	Listening	
15 min	Information Systems	Drawing, Chalk and Talk	Explanation	Watching & Listening	
10 min	Functions of Information Systems	Chalk and Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will observe the concept of Fundamentals of Information Technology (Session 3)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10 min	Management Information System (MIS)	Chalk and Talk	Explanation	Listening	The student designs integrated management of a manufacturing firm
15 min	Strategic Information System (SIS)	Drawing, Chalk and Talk	Explanation	Watching & Listening	
20 min	Information Networking	Drawing, Chalk and Talk	Explanation	Watching & Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will examine concept of Parts-oriented Production Information systems (Session 4)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Parts-oriented Production Information Systems (POPIS)	Chalk and Talk	Explanation	Listening	The student organize the process according to demand or sales forecast in advance of receiving orders
15 min	Preconditions for POPIS	Chalk and Talk	Explanation	Listening	
15 min	Information Systems for Part oriented Production	Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will examine concept of Parts-oriented Production Information systems (Session 5)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10 min	Basic Construction of Parts- oriented Production systems	Talk	Explanation	Listening	The student organize the process according to demand or sales forecast in advance of receiving orders
15 min	Procedures of POPIS	Drawing, Chalk and Talk	Explanation	Watching & Listening	
15 min	Advantages	Brainstorming	Facilitating	Participation	
10 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will understand the concept of Computerized Production Scheduling (Session 6)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Group Scheduling	Chalk and Talk	Explanation	Listening	The student arrange scheduling process for manufacturing in order to reduce total production time and cost.
15 min	Solving Group Scheduling	Chalk and Talk	Explanation	Comprehends	
15 min	Modelling for Group Scheduling	Chalk and Talk	Explanation	Watching & Listening	
10 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will understand the concept of Computerized Production Scheduling (Session 7)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10min	Inputs/outputs for Group Scheduling	Chalk and Talk	Explanation	Listening	The student arrange scheduling process for manufacturing in order to reduce total production time and cost.
10 min	Interactive mode of Group Scheduling	Chalk and Talk	Explanation	Listening	
20 min	Computer aided line balancing (CALB)	Chalk and Talk	Explanation	Watching & Listening	
10 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will plan the concept of On-line Production Control Systems (Session 8)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	On-line Production control Systems	Chalk and Talk	Explanation	Watching & Listening	The student arrange an on-line, real-time mode for create new productions.
15 min	Computerized production Information systems	Drawing, Chalk and Talk	Explanation	Observation	
15 min	Structure of On-line Production control	Drawing, Chalk and Talk	Explanation	Participation	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will plan the concept of On-line Production Control Systems (Session 9)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Scheduling and control of On-line production	Chalk and Talk	Explanation	Listening	The student prepares the tool - life parameters.
15 min	Optimum-seeking machining	Drawing, Chalk and Talk	Explanation	Comprehends	
15 min	OSM Algorithm	Chalk	Facilitates	Participation	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will Perform Concept of Computer-based Production Management Systems (Session 10)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Computerized Production management	Talk	Facilitating	Listening	The student control of mfg systems for optimum results.
15 min	Computerized mfg information systems	Chalk and Talk	Explanation	Listening	
15 min	Modules/Functions involved in COPICS	Chalk and Talk	Explanation	Comprehends	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

UNIT- V Session Plan

Learning Objective: At the end of the session the student will examine the Concept of Global Manufacturing (Session 1)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15 min	Global Manufacturing	Innovative introduction	Explanation	Comprehends	The student analyze optimum of resources of production available throughout the world
10 min	What is the need of Global Mfg?	Chalk and Talk	Explanation	Participation	
15 min	Advantages	Brainstorming	Facilitating	Participation	
10 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will understand the Concept of Movement towards Globalization (Session 2)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
15min	Movement towards Globalization	Chalk and Talk	Explanation	Listening	The student analyze optimum of resources of production available throughout the world
15 min	Multinational Enterprise	Chalk and Talk	Explanation	Listening	
15 min	Theories concerning Globalisation	Chalk and Talk	Explanation	Listening	
5 min	Summary / Q&A	Oral	Quiz Master	Participation	

Learning Objective: At the end of the session the student will plan the Concept of International Production (Session 3)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10 min	International Production	Chalk and Talk	Explanation	Listening	The student plan the global manufacturing in order to maximize total profits of industry
15 min	International and World-class Mfg	Chalk and Talk	Explanation	Listening	
15min	Foreign Production Rate	Talk	Explanation	Listening	
10 min	Global Mfg Performance	Chalk & Talk	Explanation	Listening	

Learning Objective: At the end of the session the student will apply the Concept Export and Import of industrial products. (Session 4)

Duration	Content	Methodology	Faculty Approach	Learner's Activity	Learning Outcome (Skill, etc)
10 min	Export – driven Economy	Chalk and Talk	Explanation	Listening	The student applies export and import of industrial products.
15 min	Comparison Japanese, US and German Trades	Chalk and Talk	Explanation	Watching & Listening	
15 min	Export and Import	Case study	Observes	Analyses	
10 min	Summary / Q&A	Oral	Quiz Master	Participation	

6. Examination Scheme:

Component	Duration(minutes)	Marks	Date & Time
Test – I	50	20	01-03-2010 to 06-03-2010
Test – II	50	20	05-04-2010 to 10-04-2010
Quiz – 2	50	10	07-06-2010 to 12-06-2010
Surprise quiz (5 out of 8)		5	
Attendance		5	
Comprehensive Examination	180	40	21-06-2010

7. Chamber consultation Hours:

Every Day: 4 pm to 5 pm

8. Notices:

Will be posted on the department notice board and put up on the e-learning web site

G.Yedukondalu
(Course Coordinator)