



GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc.), 4th Semester

Branch: Production Technology

Subject Name: Production Automation & Computer Integrated Manufacturing

Subject Code: 21140301

Type of course: UG

Prerequisite: Zeal to learn the subject

Rationale: Design of components to manufacturing and also includes Planning and controlling the processes. Automobile Industries widely use CNC, FMS and Robotics technology now a day. Students will be familiar with its hardware and software and also able to write programs for machining and application of CIM in automobile assembly and ancillaries industries

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical		
			C	ESE (E)	PA(M)	ESE (V)	PA (I)	
3	0	0	3	50	0	0	0	50

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Contents:

Sr. No.	Content	Total Hrs.	Module % Weightage
01	Introduction to CIM and Automation: Automation in production systems, automated manufacturing systems-types of automation, reasons for automating, Computer Integrated Manufacturing, computerized elements of a CIM wheel. Types of production: Job shop production, Batch production Mass production (Quantity Production and Flow production).	10	20
02	PRODUCTION CONCEPT: Manufacturing Lead Time (MLT), production rate, components of operation time, Production Capacity (PC), utilization and availability, Work in Process (WIP), Time in Plant (Tip), WIP Ratio, tip ratio.	10	25
03	ASSEMBLY SYSTEM AND LINE BALANCING: Line balancing problems, computerized line balancing methods, other ways to improve the line balancing, and flexible manual assembly line. Manual assembly lines, design for automated assembly, types of automated assembly systems, parts feeding devices, multi-station assembly machines.	10	20
04	DNC, CNC & ADAPTIVE CONTROL: Direct Numerical Control (DNC), Computer Numerical Control	08	25



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	(CNC), Adaptive Control Machining, current trends in CNC, introductory idea of FMS (Flexible Manufacturing System).		
05	Robot Technology Different types of robot and its mechanism, industrial applications of robot, advantages and disadvantages.	04	10
	Total	42	100

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	20	-	-	-

R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Course Outcomes:

Sr. No.	CO Statement	Marks % Weightage
CO 1	To learn fundamentals of manufacturing, CIM and automation.	20
CO 2	To understand production concept.	25
CO 3	To learn the fundamentals of assembly system and line balancing.	20
CO 4	To learn DNC, CNC in production system	25
CO 5	To study about robot technology for different manufacturing processes.	10

Reference Books:

1. Numerical Control Machines: NK Mehta
2. Production Automation & Computer Integrated Manufacturing: MP Groover
3. CAD/CAM and Automation : FARAZDAK HAIDERI

List of Open Source Software/learning website:

www.nptel.ac.in