GUJARAT TECHNOLOGICAL UNIVERSITY

MECHANICAL (PRODUCTION ENGINEERING) (28)
FLEXIBLE MANUFACTURING SYSTEM
SUBJECT CODE: 2742804
M.E. 4TH SEMESTER

Type of course: Major Elective - I

Prerequisite: NIL

Rationale: This course provides the knowledge of Group Technology in Production Technology. This course gives hands on practice regarding development of Older Manufacturing Unit renovating Intelligent Automation like Computer Aided Process Planning and various Automated Guided Vehicle in Big Industries for mass production.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
				Theory Marks		Practical Marks				
L	T	P	C	ESE (E)	PA (M)	ESE (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	**Group Technology:** Introduction, objectives, part families, algorithms and models for G.T. - Rank order clustering, Bond energy, mathematical model for machine – component cell formation. Design and manufacturing attributes. Parts classification and coding, concept of composite job machine group, cell group tooling, design rationalization.	**06**	18
2	**Computer Aided Process Planning:** Generative and variant types, backward and forward approach, feature based and CAD based CAPP.	**04**	14
3	Introduction to FMS - concepts, advantages, components of FMS and their integration in the data processing systems, FMS scheduling - examples of FMS installations.	**05**	16
4	Distributed data processing in FMS –DBMS and their applications in CAD/CAM and FMS – distributed systems in FMS -Integration of CAD and CAM - Part programming in FMS, tool data base - Clamping devices and fixtures data base.	**06**	18
5	**Material Handling systems:** conveyors - AGVs – industrial robots in material handling - AS/RS.	**05**	16
6	**Interfacing of computers - machine tool controllers and handling systems:** communications standards - programmable Logic Controllers (PLC's) – Interfacing - Computer aided Project planning dynamic part scheduling.	**06**	18

Reference Books:

1. Paul Ranky., "The design and operation of FMS", IFS publication, 1983.
2. Mikell P Groover, "Automation Production systems, Computer Integrated Manufacturing", Prentice Hall, 1987.
3. David J.Parrish, "Flexible Manufacturing" Butterworth-Heinemann, 1990.
4. Computer Aided Manufacture by Chien Chang and Richard A Wysk, Prentice HALL
5. G.T. in the engineering industry Burbridge.
6. CAD / CAM / CIM by P. Radhakrishnan, S. Subramanyan, New Age International.
7. Global Manufacturing, YORAM KORAM

Course Outcome:

This course gives knowledge about different major industrial application related to modernize Production.

List of Tutorials:

1. Study about Group Technology
2. Study about CAPP
3. Study about FMS Components and Interfaces
4. Study about Automated Material Handling Systems

Major Equipments:

1. AGV
2. MATERIAL HANDLING TOOLS

List of Open Source Software/learning website:

1. **http://nptel.ac.in/courses/110106044/37**

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.