GUJARAT TECHNOLOGICAL UNIVERSITY

PLASTIC TECHNOLOGY (24)
ADVANCED MOULD MANUFACTURING
SUBJECT CODE: 2742401
SEMESTER: IV

Type of course: Theoretical + Practical

Prerequisite: Basic knowledge Co-ordinate system Axes, machining of materials.

Rationale: Correlate appropriate manufacturing method and designing for plastics mold.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks		Practical Marks				
				ESE (E)	PA (M)	PA (V)		PA (I)		
						ESE	OEP	PA	RP	
3	0	2#	4	70	30	20	10	10	10	150

Content:

Sr. No	Course Content	Hours	% Weightage
1	Programming and Operation of CNC Machines: Introduction – Co-ordinate system – Dimensioning – Axes and motion nomenclature – Part programme structure – Tool compensation – MDI – Sub-routines – Canned cycle – Machining cycles – Programming examples for Machining centre – Turning centre – Introduction to Computer and CAD/CAM	10	30
2	Productivity Solutions for The Manufacturing of Moulds & Dies: CNC Tooling – Different tool materials – Applications – Different tool coatings – Endmills – Ballnose – Selection criteria – Chip thickness with milling cutters – special tools for die and mould making – Tool presetting – Effective and efficient process planning	12	35
3	Advanced Manufacturing System: Introduction – Mould making techniques – Electronic data processing (EDP) – Mould making using computer integrated manufacturing – CAD for part construction – Interfaces – Softwares – CAD mould design – Data preparation for machining operation – advantages of machining using CAM – Reverse engineering – Rapid prototyping	10	20
4	Design of Modern CNC Machines : Introduction – Machine structure – Guide ways – Feed drives – Spindles / Spindle bearings – Measuring systems – Controls, software and User Interface – Gauging – tool monitoring system – Ball screw and nut – Feedback element – Equipment for assembly – Troubleshooting	10	15

References Books:

1. Cyril Donaldson George H. Lecain V.C. Goold, Tool Design, TATA McGraw-Hill, 1998.
2. Richard R. Kibbe John E Neele, Roland O Mayer, Warran White, Machine Tool Practices, Prentice Hall of India Pvt. Ltd., 1999.

3. Stoeckhert Mennig, Mould Making Hand Book, Hansel Publishers.

Course Outcome:

After learning the course the students should be able to: write a programme for CNC machine, operate, identify and analyze individual operation. And also can perform the procedure, calculations, observation, of each operation.

List of Practicals:

1. Introduction of unconventional machining processes.
2. To study about CNC milling machine & its part programming.
3. To study about CNC Lathe machine & its part programming.
4. To study about CNC EDM machine & its part programming.
5. To study about CNC Wire cut machine & its part programming.
6. To study about mold making using computer integrated manufacturing.
7. To study about different tool materials & its applications.
8. To study about Reverse Engineering.

Design Engineering Problems/Open Ended Problems:

1. Designing of Injection mold
2. Data preparation for machining operation
3. Part programming

Major Equipments: CNC Milling, CNC Lathe, CNC EDM, CNC Wire cut.

List of Open Source Software/learning website:
http://www.nptel.ac.in/

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.