B. E. MECHANICAL ENGINEERING				
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)				
SEMESTER - VII				
COMPUTRE AIDED MANUFACTURING LAB				
Course Code	**18MEL76**		CIE Marks	40
Teaching Hours /Week (L:T:P)	0:2:2		SEE Marks	60
Credits	02		Exam Hours	03

Course Learning Objectives:

- To expose the students to the techniques of CNC programming and cutting tool path generation through CNC simulation software by using G-Codes and M-codes.
- To educate the students on the usage of CAM packages.
- To make the students understand the importance of automation in industries through exposure to FMS, Robotics, and Hydraulics and Pneumatics.

Sl. No.	Experiments
	PART - A
1	**Manual CNC part programming** using ISO Format G/M codesfor 2 turning and 2 milling parts. Selection and assignment of tools, correction of syntax and logical errors, and verification of tool pathusing CNC program verification software.
	PART - B
2	**CNC part programming using CAM packages**. Simulation of Turning, Drilling, Milling operations. 3 typical simulations to be carried out using simulation packages like: **CademCAMLab-Pro, Master-CAM.** Program generation using software. Optimize spindle power, torque utilization, and cycle time. Generation and printing of shop documents like process and cycle time sheets, tool list, and tool layouts. Cut the part in single block and auto mode and measure the virtual part on screen. **Post processingof CNC programs** for standard CNC control systems like **FANUC, SINUMERIC and MISTUBISHI.**
	PART - C
3	**(Only for Demo/Viva voce)** **FMS (Flexible Manufacturing System)**: Programming of Automatic storage and Retrieval system (ASRS) and linear shuttle conveyor Interfacing CNC lathe, milling with loading unloading arm and ASRS to be carried out on simple components. **Robot programming:** Using Teach Pendent & Offline programming to perform pick and place, stacking of objects (2 programs). **Pneumatics and Hydraulics, Electro-Pneumatics:** 3 typical experiments on Basics of these topics to be conducted.

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.

Scheme of Examination:

One question from Part A: 40 marks

One question from Part B: 40 Marks

Viva voce: 20 Marks

Total: 100 Marks