INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

COMPUTER AIDED MACHINING AND ROBOTICS LABORATORY								
II Semester: CAD / CAM								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
BCCD23	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		0	0	4	2	40	60	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes: 45**				**Total Classes: 45**		
Prerequisite: Automation in Manufacturing								

I. COURSE OVERVIEW:

This laboratory will provide the Automation program integrates design and manufacturing to promote the present industrial requirement. This program allows a compressive study in the advances in Computer Aided Manufacturing technologies, Automation and Robotics.

II. COURSE OBJECTIVES:

The students will try to learn:

1. The part programming data generation through CAM software.
2. The APT based NC part programs for turning and Milling operations.
3. The tool path simulation for turning and Milling operation using CAM software.
4. The programming language and simulation of robots for pick and place

III.COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1	Develop part programming and sequences of operation of CNC turning machines
CO 2	Design APT based NC programming and tool path simulation for Milling and turning operations,
CO 3	Generate NC code for profile Milling operations using CAM software.
CO 4	Develop NC code and tool path simulation for profile Milling and Threading operations using CAM software.
CO 5	Develop program for robotic operations to pick and place the objects

IV. COURSE CONTENT:

Week-1: Introduction to Computer Aided Machining
Planning and selection of sequences of operation, tool setting on machine-practice.

Week-2: Part Program-1
Practice in part programming and operation of CNC turning machines, sub routines and use of cycles.

Week-3: Part Program-2
Practice in part program and operation of a machine center, joining and selection of sequence of operation, tool setting on machine.

Week-4: Numerical Control Programming-1
Generate APT based NC programming and tool simulation for drilling operation.

Week-5: Numerical Control Programming-2
Practice in APT based NC programming and tool simulation for facing operation.

Week-6: Numerical Control Programming-3
Generate of NC code for profile milling operation using CAM software

Week-7: Numerical Control Programming-4
Tool path simulation for profile milling operation using CAM software.

Week-8: Numerical Control Programming-2
Practice in APT based NC programming and tool simulation for turning operation.

Week-9: Numerical Control Programming-2
Practice in APT based NC programming and tool simulation for knurling operation.

Week-10: Numerical Control Programming-2
Practice in APT based NC programming and tool simulation for milling operation.

Week-11: Numerical Control Programming-5
Develop NC code and tool path simulation for thread operation using CAM software

Week-12: Robotics Simulation-1
Practice of robotic languages

Week-13: Robotics Simulation-2
3-D Robot Simulation for operation of pick-place robot.

Week-14: Robotics Simulation-3
Path following operation for the robot.

V. TEXT BOOKS:

1. Farid Amirouche, "Principles of Computer-Aided Design and Manufacturing, Pearson, 2nd edition, 2018.
2. P. Radha Krishnan, "CAD/ CAM/ CIM", New Age International, 4th edition, 2018.
3. Warren. S. Seames, "Computer Numerical Control Concepts and Programming", Delmar Cengage Learning, 4th edition, 2019.

VI. WEB REFERENCES:

1. http://sbmpme.blogspot.in/2011/01/cad-cam-cim-p-radhakrishnan.html.
2. https://www.scribd.com/doc/228624725/cad-cam-text-book-by-P-N-RAO.