Course Type	Course Code	NameofCourse	L	T	P	Credit
DC	NMEC526	**Computer Aided Manufacturing and Automation**	3	1	0	4

CourseObjective
To provide detailed understanding of advances in manufacturing particularly in computer numerical control and automation.
LearningOutcomes
Upon successful completion of this course, students will: • Broad understanding of Computer Numerical Control machines and working of its components. • The students will able to learn the CNC programming for the machining given engineering component • Students will also learn about the automation used in manufacturing environment.

Unit No	Topics	Lecture Hours + Tutorial Houirs	LearningOutcome
1	Introduction,Evolution,BenefitsofCAM,Roleof management in CAM, Introduction to FMS, CIM, JIT/Lean Manufacturing, Sustainable Manufacturing	6	Understanding of broad aspect of advancesinmanufacturingandits impact on productivity.
2	NC/CNC Machine Tools: NC and CNC Technology: Principles, Classification, Specifications and components, Construction Details: interpolators for machining, drives, feedback devices, tooling, adaptive control systems; CNC Applications.	10 + 4	Understanding of difference between different CNC technology, its basic componcnts, anddifferentsensorsusedinCNC machines. The students will learn the principle of interpolators, derives and sensors used in CNC.
3	CNC Programming:Types, Manual Part Programming, canned Cycles and loops, Automated Partprogramming.Simulationofmachiningprocess.	10 + 4	Understanding of thermal based unconventional processes (UMP). The students will learn the importanceofhighpulseenergy source.
4	Introduction, to PLC and relay based automation techniques	8	Thestudentswilllearnthebasic function of robotics and its application.
5	Programmable Logic Controller (PLC): Types of PLC programming, Ladder logic, Digital and Analog based PLC control Analog to Digital and Digital to Analog conversion Motion control using PLC, application of sensors in motion control	8 + 6	Running and controlling the motor rotation and linear motion based on the programming on the PLC. Sensor based based control of motion.
	TOTAL	42 + 14	

Textbooks:

1. ComputercontrolofManufacturingsystem,Yoramkoren,McGrawHillPublication, Reprint 2005
2. Introduction to Industrial Automation, StamatiosManesis and George Nikolakopoulos, CRC press.

Reference books:

1. Mechatronics. W. Bolton, Pearson publishers, 4th Edition.