ROBOTICS

Course code	20ME2702B	Year	IV	Semester	I
Course category	Open Elective-4	Offering Branch	ME	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Nil
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

	Statement	Level
CO1	Understand the basic anatomy of robots, actuators, end effectors, robot sensors, programming and applications.	L2
CO2	Understand the working principles of robot actuators, end effectors	L2
CO3	Apply robot programming skills	L3
CO4	Apply knowledge of robot sensors and their applications in industries	L3

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3: High, 2: Medium, 1:Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												3	1
CO2	3	3											3	1
CO3	3	3	2		2								3	1
CO4	3		2										3	1

Syllabus

UNIT NO	Contents	Mapped COs
I	**Introduction:** Automation and robotics – History of robots -Robot anatomy – classification of robots, major components-robot specifications, selection of robots.	CO1
II	**Robot actuators**- Pneumatic, Hydraulic actuators, electric & stepper motors **End Effectors**- types of end effectors, grippers and tools, Requirements and challenges of end effectors.	CO1, CO2
III	**Robot Programming: -** Robot programming languages - programming methods - off and on-line programming - Lead through method - Teach	CO1, CO3

	pendent method, simple programs.	
IV	**Sensors used in robots:** Sensor devices, Types of sensors - contact, position and displacement sensors, Force and torque sensors - Proximity and range sensors - acoustic sensors –slip sensors, Robot vision systems	**CO1, CO4**
V	**Applications of robots:** Application of robots in industry - material handling, processing operations, assembly, and inspection operations.	**CO1, CO4**

Learning Resource
Text books:
1. Mikell P. Groover. Industrial Robotics Technology Programming and Applications, McGraw Hill Co., Singapore, 1995. 2. Robotic Engineering by Richard D.Klafter, Prentice Hall
Reference books
1. Introduction to Robotics – Saeed B.Niku, Prentice Hall 2. Introduction to Robotics – John J. Craig, Addison Wesley
E-Resources & other digital Material:
1. http://nptel.ac.in/downloads/112101098/