ROBOTICS

Open Elective-IV

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

Course Outcomes: Upon successful completion of the course, the student will be able to				
	Statement	**Skill**	**Level**	**Units**
CO1	Understand the basic anatomy of robots, actuators, end effectors, robot sensors, programming and applications.	Understand	L2	1,2,3,4,5
CO2	Understand the working principles of robot actuators, end effectors	Understand	L2	2
CO3	Apply robot programming skills	Apply, Modern Tool Usage	L3	3
CO4	Apply knowledge of robot sensors and their applications in industries	Apply	L3	4,5

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													
CO2	3	3												
CO3	3	3	2		2									
CO4	3		2											

Syllabus		
UNIT	**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 pendent method, simple programs.	**CO1, CO3**
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/