20ME2702B - ROBOTICS

Offering Branches	ME		
Course Category:	Open Elective -IV	Credits:	3
Course Type:	Theory	Lecture-Tutorial-Practical:	3-0-0
Prerequisites:	-	Continuous Evaluation:	30
		Semester End Evaluation:	70
		Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to:

CO1	**Understand** the basic anatomy of robots, actuators, end effectors, robot sensors, programming and applications.	**K2**
CO2	**Understand** the working principles of robot actuators, end effectors	**K2**
CO3	**Apply** robot programming skills	**K3**
CO4	**Apply** knowledge of robot sensors and their applications in industries	**K3**

Contribution of Course Outcomes towards achievement of Program Outcomes

	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
Avg.	**3**	**3**	**2**		**2**								3	1

1- Low **2-Medium** **3-High**

Course Content

UNIT-1	**Introduction:** Automation and robotics – History of robots -Robot anatomy – classification of robots, major components-robot specifications, selection of robots.	**CO1 CO2 CO3 CO4 CO5**
UNIT-2	**Robot actuators**- Pneumatic, Hydraulic actuators, electric & stepper motors **End Effectors**- types of end effectors, grippers and tools, Requirements and challenges of end effectors.	**CO2**
UNIT-3	**Robot Programming: -** Robot programming languages - programming methods - off and on-line programming - Lead through method - Teach pendent method, simple programs.	**CO3**
UNIT-4	**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.	**CO4 CO5**
UNIT-5	**Applications of robots:** Application of robots in industry - material handling, processing operations, assembly, and inspection operations.	**CO1 CO2 CO3 CO4 CO5**

Learning Resources

Text Books	1. Mikell P. Groover. Industrial Robotics Technology Programming and Applications, McGraw Hill Co., Singapore. 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/