MAHENDRA ENGINEERING COLLEGE
(Autonomous)

Syllabus

Department	Electronics & Instrumentation Engineering	Programme Code			1061	
Course code	Course Name	Hours/week			Credit	Maximum Marks
		L	T	P	C	
15EI15601	ROBOTICS AND AUTOMATION	3	0	0	3	100

Objectives	To study the various parts of robots and fields of robotics. To study the various power sources and sensors of robots. To study the programming for robot. To study the control of robots for some specific applications

UNIT I BASIC CONCEPTS	**9**
Definition and origin of robotics different types of robotics – various generations of robots – degrees of freedom – Asimov's laws of robotics – dynamic stabilization of robots	
UNIT II POWER SOURCES AND SENSORS	**9**
Hydraulic, pneumatic and electric drives – Determination of HP of motor – Variable speed arrangements – Path determination – Micro machines in robotics – Machine vision – Ranging – Laser – Acoustic and tactile sensors.	
UNIT III MANIPULATORS, ACTUATORS, GRIPPERS & PATH PLANNING	**9**
Construction of manipulators – Manipulator dynamics and force control – End effectors – Û various types of grippers – Design considerations - Path Planning - Robot cycle time analysis – hill climbing techniques	
UNIT IV ROBOT PROGRAMMING	**9**
Methods of Robot programming – lead through programming methods – robot program as a path in space – motion interpolation – weight, signal and delay commands – Robot programming examples for pick and place application using VAL..	
UNIT V CASE STUDIES	**9**
Robots in manufacturing and non-manufacturing application – robot cell design – selection of robot - Application of robots in material handling, processing operations, assembly and inspection – Future applications of robots	
Total Periods	**45**

Course outcome	At the end of the course, the students • Able to get adequate knowledge in Robotics And its Structures. • Able to get knowledge on the Automation.

Text books:

1.Mikell P. Groover, Milchel Wein Roger Nagel and Nicholas G. Ordy, "Industrial Robotics, Technology, Programming and Applications", Mc Graw Hill, Last Print, 2005.

References:

1. Fu, K.S., Gonzalez RC., and Lee C.S.G., "Robotics control, sensing, vision and intelligence," Mc Graw Hill, 1987.
2. Deb.S.R, "Robotics Technology and Flexible Machine Design", Tata McGraw Hill, 2005.