

COURSE CODE: 1152EE119	COURSE TITLE: PRINCIPLES OF ROBOTICS	L	T	P	C
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COURSE CATEGORY:

Program **Elective**

PREAMBLE :

To study the basic concepts of robotics and their design

PREREQUISITE COURSES:

Microprocessor & Microcontroller

COURSE EDUCATIONAL OBJECTIVES :

The objectives of the course are to make the students,

- Robotics is the engineering science and technology of robots, and their design, manufacture, application, and structural disposition.

COURSE OUTCOMES :

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

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Understand about the basics of automation and robotics	K2
CO2	Explain the basics of Control and analysis of robotics motion	K2
CO3	Give a brief Introduction about artificial intelligence	K2
CO4	Write basic programming in robotics	K2
CO5	Explain about the applications of robots	K2

CORRELATION OF COs AND POs

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	L	H									
CO2		L	H									
CO3		M			L							H
CO4	M		L	H								
CO5		L	M									

COURSE CONTENT:

UNIT I | INTRODUCTION

9

Automation and robotics; Robot Anatomy; Classifications of Robots by DOF motion, platform, power source, intelligence and application area.

BASIC COMPONENTS OF ROBOTS

a) Manipulators; Wrists; End effectors; Control units; Power units; Robot sensors;

b) Robot sensors; Proximity sensors; Ranger sensors, Tactile sensors; Visual sensors; Sensors for mobile Robots.

UNIT II	ROBOT MOTION ANALYSIS AND CONTROL	9
Introduction to manipulator kinematics; Homogeneous transformations and Robot kinematics; Manipulator path control; Robot dynamics; configuration of a Robot controller; Obstacle avoidance.		
UNIT III	ARTIFICIAL INTELLIGENCE	9
AI –techniques – fuzzy logic, neural network ; LISP programming; AI and Robotics; LIPS in the factory; Sensing and digitizing function machine vision; Image processing and analysis; training and vision system; natural language processing; speech recognition; legged locomotion; collision avoidance; natural networks computing.		
UNIT IV	ROBOT PROGRAMMING	9
Methods of Robot programming; lead through programming methods; a robot program as a path in space; motion interpolation; weight, signal and delay commands; Branching, capabilities and limitations of lead through methods.		
UNIT V	APPLICAIONS OF ROBOT	9
Material handling; Processing operations; Assembly and inspection; Future application.		
TOTAL: 45 PERIODS		
TEXT BOOKS:		
<ol style="list-style-type: none"> 1. Mikell P.Groover, Michell wein,Roger N. Nagal and Nicholas G.Ordey, "Industrial Robotics, technology, Programming and applications" Mc Graw Hill, Last print, 1987. 2. Harry H. Poole, "Fundamentals of Robotics Engineering", Van Nostrand Reinhold, New York, 1989. 		
REFERENCE BOOKS:		
<ol style="list-style-type: none"> 1. V.Damel Hunt, "Smart Robots", Chappan and Hall, 1985 2. P.G.Ranky, C.Y.Ho, "Robot Modeling", IFS (publication) Ltd., UK., 1985. 3. Wenwar L. Hall, Bethe C. Hall, "Robotics – A user friendly introduction", Holt – Saunders International Edition, Japan, 1985. 		