COURSE CODE: **1154EE109**	COURSE TITLE: **INTRODUCTION TO ROBOTICS**	L	T	P	C
		3	**0**	**0**	**3**

COURSE CATEGORY:

University Elective

PREAMBLE :

To study the basic concepts of robotics and their design

PREREQUISITE COURSES:

Microprocessor & Microcontroller

RELATED COURSES:

Embedded Systems

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)
C01	Introduction about basic components and types of robots	K1
C02	Analysis of robot motion and control	K2
C03	Basic concepts of Artificial intelligence	K2
C04	Robot programming introduction	K2
C05	Applications of robotics	K2

CORRELATION OF COs AND POs

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

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 COMPONENS OF ROBOTS 9

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:

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:

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 introducion", Holt – Saunders International Edition, Japan, 1985