Course Number and Name
BGE005 – INDUSTRIAL ROBOTICS
Credits and Contact Hours
3&45
Course Coordinator's Name
Mrs.Vijaya
Text Books and References

TEXTBOOK:

1. Michael P.Groover, Mitchell Weiss, Industrial Robotics Technology Programming and applications, - McGraw Hill International Editions, 1989.

References:

1. K.S.Fu., R.C. Gonalez , C.S.G. Lee, Robotics, Control sensing, Vision and Intelligence, - McGraw Hill International Editions, 1987.
2. Michael – B.Histland, David. G. Aliatoce., Introduction to Mechatronics and Measurement Systems, McGraw Hill International. Edition, 1999.
3. www.e-booksdirectory.com › Engineering

Course Description
To understand the basic concepts associated with the design and Functioning and applications of Robots To study about the drives and sensors used in Robots To learn about analyzing robot kinematics and robot programming

Prerequisites	Co-requisites
MECHATRONICS	ELECTRONICS FOR MECHANICAL SYSTEMS

required, elective, or selected elective (as per Table 5-1)
Non Major Elective

Course Outcomes (COs)	
CO1	Upon completion of this course, the students can able to apply the basic engineering
CO2	To learn about knowledge for the design of robotics.
CO3	Will understand robot kinematics and robot programming.
CO4	Will understand application of Robots
CO5	To learn about force and torque sensing
CO6	To learn about application of robot

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l
CO1	M											
CO2					H			M				H
CO3	M											H
CO4					H					L		H
CO5	M		H		H							H
CO6	M											

List of Topics Covered

UNIT I INTRODUCTION TO ROBOTICS **9**

Definition of Robot – Laws of Robotics – Basic concepts – Robot Configuration – Types of Robot drives – Basic Robot motions – Point to Point control – Continuous path control – Accuracy and repeatability.

UNIT II COMPONENTS OF ROBOTICS **9**

Control system components-Control system analysis–Actuation and feed back– manipulators – Direct kinematic model and inverse kinematic model – Coordinate transformation – Robot dynamic modeling – Types of Robot and end effectors - Tools as end effectors

UNIT III SENSING AND MACHINE VISION **9**

Range sensing – Proximity sensing – touch sensing – force and torque sensing.

Introduction to machine vision – Sensing and digitalizing – Image processing and analysis.

UNIT IV ROBOT PROGRAMMING **9**

Methods online/ offline – Show and teach – Teach pendant – lead and teach – Languages Explicit – task level – capabilities and limitation – Artificial intelligence – Knowledge representation – Search techniques.

UNIT V ROBOT APPLICATIONS **9**

Applications of robots in machining – Welding – Assembly – Material handling – processing – Loading and un loading – CIM inspection – Hostile and remote environments – Non industrial applications.