ANNAMALAI UNIVERSITY

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

25ECVAC03	BASICS OF ROBOTICS	L	T	P
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UNIT I : AUTOMATION

Mechanization and Automation - - Reasons for automation - Types of Automation: Fixed, Flexible and Programmable Automation - Automation and Robotics.

UNIT II : FUNDAMENTALS OF ROBOTS

Definition - Robot Anatomy - Robot configuration: Polar, Cylindrical, Cartesian coordinate, Joint-arm configuration - Degree of freedom - Work volume - Dynamic performance: Speed of response, Accuracy, Repeatability-Robot Drive System: Hydraulic, Electric and Pneumatic.

UNIT III : INTRODUCTION TO ROBOT END EFFECTORS, SENSORS AND CONTROL SYSTEM

End Effectors: Types: Mechanical grippers, Magnetic grippers, Vacuum cups- Tools as end effectors

Design of Sensors: Transducers and Sensors - Sensors in Robotics: Tactile, Proximity and Range Sensors, sensor-based systems - Robot Vision System.

Control System: Lead-through Programming, Walk-through Programming, Use of Teach pendants.

UNIT IV : LAB WORK

Experiments on various sensors and drive system in connection with Robotic system.

UNIT–V : ROBOT PROGRAMMING AND APPLICATIONS

Robot Programming: Textural Programming: Common languages/Software used- Robot program as a path in space- Experiments on Lead-through Programming, Walk-through Programming, Use of Teach pendants.

TEXT BOOKS

1. Groover, M.P., Automation, Production Systems, and Computer-Integrated Manufacturing, Prentice-Hall of India Private Limited, New Delhi, 2007.
2. Groover, M.P., Weiss, M., Nagel, R.N., Odrey, N.G., Industrial Robots: Technology, Programming and Applications, McGraw-Hill Book Company, 2012

REFERENCE BOOKS

1. Deb, “Robotics Technology and Flexible Automation”, Tata McGraw Hill, 1994.
2. Saeed B. Niku, An Introduction to Robotics- Analysis, Systems, Applications, Second Edition, John Wiley & Sons Inc., 2010.
3. Wesley, E. Sryda, “Industrial Robots: Computer interfacing and Control” PHI, 1985.
4. Yoran Koren, Robotics for Engineers, McGraw Hill, 1980.