

K L University
Department of Electronics & Computer Engineering
M.Tech (Embedded Systems)

Course No. : 15-EM51A2
Course Title : Robotics
Course Structure : 3-0-0

SYLLABUS:

Unit – I :

Introduction & Basic Definitions: Introduction, Control Programs for Robots, Industry Applications of Robots, Pick and Place, Gantry and Armtype Robots in typical set-ups like Automobile Industry

Coordinate Systems: Cartesian, Cylindrical, Polar, and Revolute systems: Robot Positioning: Robot Arms; Axes, their ranges, offset and In-line Wrist: Roll, Pitch and Yaw, their meaning in Robotics

Unit-II :

Mechanical Aspects: Kinematics, Inverse Kinematics, Motion planning and Mobile Mechanisms

Unit-III :

Sensors and Applications: Range and Use of Sensors, Micro switches, Resistance Transducers, Piezo-electric, Infrared and Lasers. Applications of Sensors : Reed Switches, Ultrasonic, Barcode Readers and RFID

Unit-IV

Robot Systems: Hydraulic and Electrical Systems including pumps, valves, solenoids, cylinders, stepper motors, Encoders and AC Motors

Unit-V

Programming of Robots: Programming of Robots such as Lego Robots, Programming environment, Example Applications, Safety considerations

Text Books:

1. Introduction to Robotics – P.J.McKerrow, ISBN : 0201182408
2. Introduction to Robotics – S.Nikv, 2001, Prentice Hall,
3. Mechatronics and Robotics: Design & Applications – A.Mutanbara, 1999, CRC Press.

References:

1. Robotics – K.S.Fu, R.C.Gonzalez and C.S.G.Lee, 2008, TMH.