

Acad Unit: 3.0
Prerequisite: Nil
Effective: Acad Year 2000-2001
Last update: 20 March 2000

OBJECTIVE

This course introduces fundamental concepts in robotics and intelligent sensing techniques. The objectives of the course are to provide an introductory understanding of robotics and intelligent sensors. Students will be exposed to a broad range of topics in robotics and intelligent sensors, with emphasis on basic of manipulators, coordinate transformation and kinematics, trajectory planning, control techniques, mobile robot kinematics, intelligent sensors, especially on the machine learning capability of robot kinematics and dynamics in a closed loop system.

DESIRED OUTCOME

On completion of this course, the student will be able to model robot manipulators and mobile robots; solve an inverse kinematics problem and plan a robot trajectory; design and analyze robot controllers by using appropriate methods; design basic robot intelligent sensor systems including static system learning (kinematics) and dynamic learning; and intelligent subject recognition.

OTHER RELEVANT INFORMATION

NIL

CONTENT

Overview of robotics. Motion planning and control. Mobile robots . Controller hardware/software systems. Sensor systems and integration.

ASSESSMENT SCHEME

Continuous Assessment	20%
Final Examination	80%

TEXTBOOKS

1. Schilling R. J., Fundamentals of Robotics: Analysis and Control, Prentice Hall, 1990.
2. Siegwart R., Nourbakhsh I.R. and Scaramuzza D., Introduction to Autonomous Mobile Robots, The MIT Press, 2011

REFERENCES

1. Niku S.B., Introduction to Robotics: Analysis, Control, Applications, Wiley, 2010
2. Craig, J.J., Introduction to Robotics: Mechanics and Control, Pearson, 2004