

RO8003 ARTIFICIAL INTELLIGENCE FOR ROBOTICS

DETAILED SYLLABUS

OBJECTIVES:

The student should be made to:

- Study the concepts of Artificial Intelligence.
- Learn the methods of solving problems using Artificial Intelligence.
- Introduce the concepts of Expert Systems and machine learning.
- Learn about planning and reasoning artificial intelligence.
- Solve the risk in artificial intelligence.

UNIT I INTRODUCTION

History, state of the art, Need for AI in Robotics. Thinking and acting humanly, intelligent agents, structure of agents. PROBLEM SOLVING: Solving problems by searching –Informed search and exploration–Constraint satisfaction problems–Adversarial search, knowledge and reasoning–knowledge representation – first order logic.

UNIT II PLANNING

Planning with forward and backward State space search – Partial order planning – Planning graphs–Planning with propositional logic – Planning and acting in real world.

UNIT III REASONING

Uncertainty – Probabilistic reasoning–Filtering and prediction–Hidden Markov models–Kalman filters–Dynamic Bayesian Networks, Speech recognition, making decisions.

UNIT IV LEARNING

Forms of learning – Knowledge in learning – Statistical learning methods –reinforcement learning, communication, perceiving and acting, Probabilistic language processing, perception.

UNIT V AI IN ROBOTICS

Robotic perception, localization, mapping- configuring space, planning uncertain movements, dynamics and control of movement, Ethics and risks of artificial intelligence in robotics.

TEXT BOOKS:

1. Stuart Russell, Peter Norvig, “Artificial Intelligence: A modern approach”, Pearson Education, India2003.
2. Negnevitsky, M, “Artificial Intelligence: A guide to Intelligent Systems”, Harlow: Addison-Wesley, 2002.

REFERENCE:

1. David Jefferis, “Artificial Intelligence: Robotics and Machine Evolution”, Crabtree Publishing Company, 1992.