RAI 914 Robot Motion Planning (3-0)

Textbook: Planning Algorithms by Steven M. LaValle, Cambridge University Press, 2006. ISBN-10: 0521862051, ISBN-13: 978-0521862059

Reference Book: Robot Motion Planning, By Jean-Claude Latombe, Kluwer Academic Publishers. ISBN-10: 079239206X, ISBN-13: 978-0792392064 **Objective:**

The aim of this course is to teach the students about advanced techniques used for robot motion planning. The course combines the knowledge of robotics with that of artificial intelligence and control theory to give the students a practical overview of the cutting edge methods used in the area of planning algorithms.

Pre-Requisite:

EM 800 Robotics – I (or equivalent)

Course Outcome:

Students completing this course are expected to possess a firm grasp of robot motion planning algorithms.

Course Outline:

The course can broadly be outlined as motion planning, decision theoretic planning and planning under differential constraints.

Topics	Allocated Periods
Discrete Planning Logic Based Planning Methods Configuration Space Sampling Based Motion Planning Combinatorial Motion Planning Time Varying Problems Mixing Discrete and Continuous Spaces	45
Planning for Closed Kinematic Chains Feedback Motion Planning	

Basic Decision Theory Sequential Decision Theory Sensors and Information Spaces Planning under Sensory Uncertainty Differential Models Sampling Based Planning under Differential Constraints System Theory and Analytical Techniques	