RIME 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 AcademicPublishers. 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 motionplanning algorithms.

Course Outline:

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

Topics	Allocated Periods
Discrete Planning Logic Based Planning MethodsConfiguration Space Sampling Based Motion PlanningCombinatorial Motion Planning Time Varying Problems Mixing Discrete and Continuous SpacesPlanning for Closed Kinematic Chains Feedback Motion Planning Basic Decision Theory Sequential Decision Theory Sensors and Information Spaces Planning under Sensory UncertaintyDifferential Models Sampling Based Planning under Differential ConstraintsSystem Theory and Analytical Techniques	45