

TENTATIVE SCHEDULE FOR Planning and Decision-making in Robotics CLASS
Fall 2018

Date	Day	Topic	HW out	HW due
27-Aug	Mon	Introduction; What is Planning?		
29-Aug	Wed	planning representations: explicit vs. implicit graphs, skeletonization, cell decomposition & lattice-based graphs		
3-Sep	Mon	LABOR DAY - NO CLASS		
5-Sep	Wed	search algorithms: A*, Weighted A*, Backward A*		
10-Sep	Mon	search algorithms: Heuristic functions, Multi-Heuristic A*	HW1	
12-Sep	Wed	interleaving planning and execution: Anytime heuristic search, Incremental heuristic search		
17-Sep	Mon	interleaving planning and execution: Real-time heuristic Search		
19-Sep	Wed	case study: planning for autonomous driving		
24-Sep	Mon	planning representations: PRM for continuous spaces		HW1
26-Sep	Wed	planning representations/search algorithms: RRT, RRT-Connect	HW2	
1-Oct	Mon	planning representations/search algorithms: RRT*		
3-Oct	Wed	case study: planning for mobile manipulators and legged robots		
8-Oct	Mon	search algorithms: IDA*, Multi-goal A*		
10-Oct	Wed	case study: planning for coverage, mapping and surveillance tasks		HW2
15-Oct	Mon	search algorithms: Markov Property, dependent vs. independent variables, Dominant Relationship	HW3	
17-Oct	Wed	planning representations: state-space vs. symbolic representation for task planning		
22-Oct	Mon	search algorithms: planning on symbolic representations		
24-Oct	Wed	dealing with uncertainty: Planning sequence of behaviors, Planning with position uncertainty estimate		
29-Oct	Mon	planning under uncertainty: Minimax formulation, Minimax Backward A*		HW3
31-Oct	Wed	planning under uncertainty: Markov Decision Processes, Value Iteration, RTDP		
5-Nov	Mon	final project proposal presentations		
7-Nov	Wed	planning under uncertainty: Partially-Observable Markov Decision Processes		
12-Nov	Mon	planning under uncertainty: Partially-Observable Markov Decision Processes (cont'd)		
14-Nov	Wed	multi-robot planning		
19-Nov	Mon	multi-robot planning (cont'd)		
21-Nov	Wed	THANKSGIVING - NO CLASS		
26-Nov	Mon	exam review		
28-Nov	Wed	exam		
3-Dec	Mon	TBD		
5-Dec	Wed	final project presentations		