

METR 4202/7202: Advanced Controls and Robotics
Course Outline -- Semester 2, 2012

<http://robotics.itee.uq.edu.au/~metr4202/>

Week	Date	Lecture (M: 12-1:30, 43-102)	Tutorial (T: 12-1, Axon-104)	Lab (F:11-1, Axon-104)	Book Ref.	Due Item	Due Date
1	23-Jul	Introduction	--	(at home: Matlab Robotics Toolbox)	Ch. 1		
2	30-Jul	Representing Position & Orientation & State (Frames, Transformation Matrices & Affine Transformations)	Mathematical preliminary	--	Ch. 2		
3	6-Aug	Robot Kinematics and Dynamics	Forward and Inverse Kinematics	Kinematics Lab (1)	Ch. 7, Ch. 8		
4	13-Aug	Robot Dynamics & Control	Newton Euler Dynamics	Kinematics Lab (2)	Ch. 9		
5	20-Aug	Obstacle Avoidance & Motion Planning	Motion planning	Kinematics Lab (3)	Ch. 5		
6	27-Aug	Sensors, Measurement and Perception	Image formation	Sensing Lab (1)	Ch. 12, Ch.	Kinematics Lab	31-Aug
7	3-Sep	Localization and Navigation	Image features (Corners, SIFT, etc.)	Sensing Lab (2)	Ch. 14		
8	10-Sep	State-space modelling & Controller Design	Cart & Pole (1)	Sensing Lab (3)			
9	17-Sep	Vision-based control	Cart & Pole (2)	Systems & Controls Lab (1)	Ch. 15, 16	Sensing Lab	21-Sep
	24-Sep	<i>Study break</i>					
10	1-Oct	Uncertainty/POMDPs	--	Systems & Controls Lab (2)			
11	8-Oct	Robot Machine Learning (TBA)	--	Systems & Controls Lab (3)			
12	15-Oct	Guest Lecture (CSIRO-TBA)	--	Systems & Controls Lab (4)			
13	22-Oct	Wrap-up & Course Review	--	Demonstration/Competition		Systems Lab	26-Oct