ESA:Systems Schedule

Class meetings	Topics	**In-class assignments: T due Th, F due T**
Day 1 F Jan 19	Intro. Input/Output systems. Review 1st order systems in time domain. Analytical and numerical solns. for free, forced-step, and forced-harmonic	
Day 2 T Jan 23	Review free response of 2nd order systems in the time domain. Analytical and numerical solutions. Connect parameters (e.g., damping ratio, natural/damped frequency) to system behavior.	
Day 3 F Jan 26	Review forced response of 2nd order systems in time domain to step and harmonic excitation. Analytical and numerical solutions.	HW 1 Due **F**, 1/26
Day 4 T Jan 30	Intro to the s-plane and the Laplace transform (LT).	
Day 5 F Feb 2	Applying the LT to solve ODEs, e.g., 2nd order ODE-output voltage of a circuit. Partial fraction expansions and the table lookup method.	HW 2 Due **F**, 2/2
Day 6 T Feb 6	Analytical Tools for 2nd order systems: Poles, zeros, transfer functions, stability, ideal oscillators (LC circuits). Symbolic MATLAB tools.	
Day 7 F Feb 9	Block diagrams. LT analysis and solution of overdamped, critically, and underdamped systems. Poles of 2nd order systems, their relationship to stability and response.	HW 3 Due **F**, 2/9
Day 8 T Feb 13	Intro to feedback control. Black's formula, Final value theorem. Proportional and PI feedback. Steady-state error.	
F Feb 16	NO CLASSES due to Candidates Weekend 1 !	
Day 9 T Feb 20	Analyzing feedback systems with MATLAB symbolic tools. PI control of a first order system.	HW 4 Due **W**, 2/21
Day 10 F Feb 23	Inverted pendulum (Rocky) eqns of motion. Formulating a feedback system for Rocky. Regulator problem	
Day 11 T Feb 27	Inverted pendulum (Rocky) project	HW 5 Due **W**, 2/28
Day 12 F Mar 1	Inverted pendulum (Rocky) project	
Day 13 T Mar 5	Inverted pendulum (Rocky) project	Quiz Due **F**, 3/8
Day 14 F Mar 8	Inverted pendulum (Rocky) project Demo Day	Final Project Deliverables Due **F**, 3/15