



PME 320800 Control System II

控制系統 二

Spring 2016

Instructor:	Prof. Jen-Yuan (James) Chang 張禎元 教授	Credits:	3 credits.
Class meetings:	T6T7T8	Office hours:	Tuesdays 17:30-18:30
Goal:	To gain a physical and mathematical understanding of how to use feedback control techniques to control linear dynamic systems through understanding of discrete-time state variable representations; pole placement via state-feedback; introduction to realization and linearization; controllability and observability theory; observer and estimator designs; introduction to Kalman filtering; linear quadratic regulator theory and digital control. Along with the classroom teaching, students will need to complete several laboratory assignments, in which assignment the taught theories and numerical modeling and simulation will be integrated to control modeled dynamic systems.		
Textbook (required):	G.F. Franklin, J.D. Powell, and A. Emami-Naeini, "Feedback Control of Dynamic Systems," 7 th Edition, Global Edition, Pearson Education Limited, England, 2015. (ISBN 10: 1-29-206890-6) (ISBN 13:978-1-29-206890-9)		
Reference:	Control Tutorials for MATLAB and SIMULINK, W.C. Messner and D.M. Tilbury, Addison-Wesley. Modern Control Engineering, 3rd edition, by Katsuhiko Ogata.		
Teaching Method:	Classroom lectures will be offered in both Chinese and English with teaching materials posted in Moodle.		
Topics to be covered:	<ol style="list-style-type: none">1. Control-mechatronics – sensors, actuators and micro-controller2. State space representation of system3. Analysis of state equation4. Controllability and observability of linear system5. Pole assignment of controllable system6. Design of estimator for observable system7. Introduction to digital control8. Lyapunov stability criterion9. Introduction to nonlinear control10. Introduction to control with vision		
Assessments:	Quizzes	20%	Approximately 45 minutes/quiz, 4-5 quizzes total. Closed book and notes. Missed quizzes: Notify Prof. Chang in advance to make up the quiz.
	Labs & Term project	50%	About 3 laboratory/computer assignments, 3-4 students per group and a final project in form of tournament.
	Final Exam	30%	In-class individual effort, closed book and notes.