MECHANICAL & AEROSPACE ENGINEERING

Course: ME 280, Automatic Control Engineering

Semester: Fall 2019

Prerequisites: BSME or Consent of Instructor

Credit Units: 3, Lecture

Class Code: 43262

Class Hours: Monday & Wednesday, 7:30-8:45 PM

Class Location: ENG 403

Instructor: Dr. Neyram Hemati

Office Hours: Monday & Wednesday, 8:45-9:45 PM
                       or by appointment

Text: Modern Control Engineering, 5th Edition, by K. Ogata,
                       Prentice Hall, 2009.

Grading: HW   10%
                       Exam #1   25%
                       Exam #2   25%
                       Final   40%

HW: The due dates for the HW will be announced at the time when assigned.
                       No late HW will be accepted.

Final Exam Time: Wednesday, December 11, 2019; 7:45-10:00 PM

Course Description: Formulation of dynamic systems in state space form. System transient response, stability, controllability, and observability. Design of control systems using conventional and modern methods. Computer aided dynamic system analysis, control system design and simulation. Matlab will be used as the computational tool in design and analysis of control systems.

References:
1. "Linear State-Space Control Systems," by R.L. Williams II and D.A. Lawrence, Wiley.
2. "Modern Control Systems," by William L. Brogan, Prentice Hall.
3. "Fundamentals of Linear State Space Systems," by John S. Bay, McGraw Hill, Inc..
4. "Feedback Control of Dynamic Systems," by Franklin, Powell, and Emami-Naeini, Addison-Wesley.
5. "Modern Control Systems," by Dorf and Bishop, Addison-Wesley.
6. "Control Systems Engineering,"by Norman Nise, Wiley.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's Catalog Policies section at http://info.sjsu.edu/static/catalog/policies.html. Add/drop deadlines can be found on the current academic calendar web page located at http://www.sjsu.edu/academic_programs/calendars/academic_calendar/. The Late Drop Policy is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/.

Academic integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The University's Academic Integrity policy, located at http://www.sjsu.edu/senate/S07-2.htm, requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sa.sjsu.edu/judicial_affairs/index.html.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the Disability Resource Center (DRC) at http://www.drc.sjsu.edu/ to establish a record of their disability.

AUTOMATIC CONTROL ENGINEERING

Date	Topics	Readings
8/21/19	Introduction	
8/26/19	Review of Classical Control Systems	Ch. 1-3
8/28/19	Review of Classical Control Systems	Ch. 5-6
9/2/19	Labor Day	
9/4/19	Using Matlab to Design Feedback Control Systems	
9/9/19	State Variable Representation of Dynamic Systems	Ch. 2-3
9/11/19	State Variable Representation of Dynamic Systems	Ch. 2-3
9/16/19	Review of Linear Algebra	Ch. 9.1-2
9/18/19	Functions of Matrices	Ch. 9.5
9/23/19	Solving Linear State Equations	Ch. 9.3,5
9/25/19	Solving Linear State Equations	Ch. 9.3,5
9/3/19	Using Matlab to Solve State Equations	
10/2/19	Exam #1	
10/7/19	Controllability	Ch. 9.6
10/9/19	Controllability	Ch. 9.6
10/14/19	Observability	Ch. 9.7
10/16/19	Observability	Ch. 9.7
10/21/19	Design of Control Systems in State Space	Ch. 10.1-4
10/23/19	Design of State Observers	Ch.10.5-7
10/28/19	Design of State Observers	Ch. 10.5-7
10/30/19	Observer-Based Control Systems	Ch. 10.5-7
11/4/19	Using Matlab to Design Observer-Based Control Systems	
11/6/19	Observer Controller	Ch. 10.5-7
11/11/19	Veteran's Day	
11/13/19	Exam#2	
11/18/19	Matlab Implementation	Notes
11/20/19	Thanksgiving	
11/25/19	Digital Control Implementation	Notes
11/27/19	Optimal Control & Kalman Filter	Ch. 10.8
12/2/19	Nonlinear Control	Notes
12/4/19	Stability	Notes
12/9/19	Review	