OLD DOMINION UNIVERSITY
Aerospace Engineering Department
SYLLABUS – AE650 – Modern Control Theory – Fall 2001

Location and Time: GORNT 204; TR 1:00 to 2:15 PM
Instructor: Prof. Thomas E. Alberts
Phone: (757)683-3736 or residence (desperation only please) (757)425-1845
Office: 241-J Kaufman Hall
Hours: TR 3:15-4:15pm (please arrange if possible)
Email: talberts@odu.edu

Perquisite: Classical controls such as ME 436 or equivalent courses taught at the level of Franklin, Powell and Emami-Naeini, Feedback Control of Dynamic Systems, Addison-Wesley. Mathematical ability with Laplace transform methods and matrix manipulation are assumed.


Grading:
- Homework 15%
- First Exam 25%
- Second Exam 25%
- Final Exam 35%

Scheduled Final Exam Date: Tuesday December 11, 12:30-3:30pm

Homework and Test Policies: PLEASE DO NOT ASK TO SUBMIT LATE HOMEWORK WITHOUT PRIOR ARRANGEMENT OR A VERY GOOD REASON! EXUSED MAKEUP TESTS MUST BE ARRANGED IN ADVANCE! Show your work in submitted homework papers. Answers submitted without work will not receive credit. Matlab may be used when explicitly assigned, or for computations involving matrices larger than 3x3. Otherwise, your work should be by hand. Matlab verification may be included at your option. In cases when Matlab is used, please submit problem development description and your code. Matlab generated plots must have your name in the title.

Topical Outline
- Introduction, Feedback, State Space
- Block Diagrams and Modeling
- State Space Theory
- Controllability and Observability
- Feedback Control and Pole Placement
- Observers
- Reduced Order Observers
- Separation Principle and Observer Design
- Optimal Control - LQR
- Survey of Random Processes
- Kalman Filters: Optimal Observers

Reading
- Chapter 1 - § all, Chapter 2 - § 1 & 2
- Chapter 2 - § 3-5, Chapter 3 - § 1
- Chapter 3 - § 2-7
- Chapter 5 - § all
- Chapter 6 - § all
- Chapter 7 - § 1-4
- Chapter 7 - § 5
- Chapter 8 - § all
- Chapter 9 - § all
- Chapter 10 - § 1-5 & 7
- Chapter 11 - § 1-6