

## **EEL 6614, Modern Control Theory I**

**Credits and Contact Hours:** 3 crs; 3 classes per week of 50 minutes each

**Textbook** A.E. Bryson and Y.C. Ho, "Applied Optimal Control: optimization, estimation and control", CRC Press, revised printing, 1975.

**a. Supplemental Material:** none

### **Specific Course Information**

- **Catalog Description:** Optimization of systems using the calculus of variations, dynamic programming, and the maximum principle. Extensive study of the linear plant with a quadratic performance index. Observers and dynamic compensators.
- **Prerequisites:** EEL 5182 or instructor consent.
- **Required, Elective, or Selected Elective:** Elective

### **Specific Goals for the Course**

- **Specific Outcomes of Instruction:** A basic course on the theory of optimal control and its applications in Engineering.
- **Brief List of Topics to Be Covered**
- Optimization of function.
- Linear Programming.
- Optimization of dynamical systems
- The Euler-Lagrange equations
- Minimum energy and minimum time optimization
- The Hamilton-Jacobi-Bellman equation
- Linear quadratic optimal control.

1. Instructor: Dr. Jacob Hammer
  - a. Office location: NEB 563
  - b. Telephone: 392-4934
  - c. E-mail address: hammer@mst.ufl.edu
  - d. Web site: mst.ufl.edu
  - e. Office hours: MWF 3:50-4:40PM
2. Teaching Assistant None
  - a. Office location
  - b. Telephone
  - c. E-mail address
  - d. Office hours
3. Meeting Times M W F 7
4. Meeting Location NEB 102
5. Grading – methods of evaluation: Homework 10%; midterm exam 35%; final exam 55%.
6. Grading Scale: The grade scale for this course is A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F. More information about the grading scale can be found at <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

7. “A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:  
<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>”
  8. Make-up Exam Policy: Approval required from UF counselor or physician.
  9. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.
  10. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.
- UF Counseling Services –Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
  - Career Resource Center, Reitz Union, 392-1601, career and job search services.
11. Software Use – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.