Course Title and Number
Modern Control Systems 0908442

Lecturer
Dr. Lutfi Al-Sharif, Mechatronics Engineering Department.
e-mail: lal-sharif@theiet.org

Course Website
The course website will contain the following:
- Any important announcements (e.g., exam dates…)
- Handout materials
- Exercises and problems (and solutions where possible)
- Home-works (and solutions where possible)
- Quizes and exams (where possible)
- Extra reading material.
- Assignments submitted by students

Course Outline
The course builds on the previous two courses on modelling and simulation and classical control theory. It introduces the student to state space modelling in detail, and compares the classical control theory to the modern techniques. Heavy reliance will be made on the use of Matlab for examples and to reinforce student understanding.

Course contents
1. Review of transfer function models (1 week).
2. Introduction to state space modelling (1 week).
3. Advantages of state space modelling over transfer function models (1 week).
4. Converting transfer functions to state space models and block diagrams and vice versa (1 weeks).
5. Revision of matrix algebra (1 week).
6. Controllable canonical form (1 week).
7. Observable canonical form (1 week).
8. Diagonal canonical form (1 week).
9. Jordan canonical form (1 week).
10. Controllability (2 week).
11. Observability (2 week).
12. Pole placement design using state feedback (1 week).
13. Observers (1 week).

Project
A project will be set. More details will be given later.

Main textbook

Course Marking
Project: 20% (the project assessment will be based on report, teamwork, time management, presentation and discussion, as well as the final working software)
Midterm Exam: 30%.
Final Exam: 50%