

Students pursue supervised research on an engineering topic and report on it periodically throughout the year. Research topics are selected from a list distributed early in the fall term, or by consultation with faculty members. Projects typically involve the design and implementation of some piece of equipment, or software; emphasis is placed on projects where engineering and mathematics fit together nicely. (For example, design and construction of a hovercraft, and the controller, has appeared as a team project in the last few years.) A written proposal for the project is due at the end of Week 4 (during the first term), and a draft of the Engineering Design Chapter of the Thesis at the end of Week 14 (during the second term). Communication skills are also stressed in the proposal, in the oral progress report in the first term, in the Engineering Design Chapter and in the final oral and written reports on the results of the investigation. In order to develop teamwork skills, students are required to work in groups (of up to four students). All projects are supervised (or co-supervised) by Mathematics and Engineering faculty members. The marks are assigned jointly by the supervisors, the course coordinator and by other Mathematics and Engineering faculty.

Coordinator: F. Alajaji

Evaluation:	Signed Project Proposal	10%
	Oral Progress Report	10%
	Draft of Design Chapter	10%
	Final Oral Report	20%
	Thesis	50%

Titles of Projects for 2004-2005:

- An Analysis of the RSA, Discrete Log, and Elliptic Curves Public-Key Cryptography Methods; Implementation and Runtime Performance
- Soft Decision Combined Source-Channel Coding
- Source Adaptive Constellation Mappings for Compressed Multimedia Data
- Information Transmission Near the Shannon Limit
- Space-time Block Codes for Multi-Antenna Fading Channels
- Application of Statistical Signal Processing to Spatially Separated Climate Data
- Active Structural Control: Implementation and Implications
- Jbot – A Non-linear Control Problem
- Jbot – Satellite Orientation Problem
- Control of a Spherical Pendulum
- Control of a Three-Disc Torsional Plant
- Stiction: Friction Compensation in the Control of an Underactuated System