

Weapons and Systems Engineering  
ES402 System Engineering Design  
Required

- Catalogue Data:** ES402 System Engineering Design (2-2-4). Introduction to the macro-techniques of engineering design including performance, reliability, management control, redundancy, man-machine systems and testing techniques. Design, construction, test and evaluation of an approved project is accomplished in the lab. Two hours of lecture and two hours of laboratory are normally scheduled for this course. Each team also meets for an additional two hours of project work each week according to a schedule arranged to accommodate all those involved.
- Prerequisite:** Prereq: ES308 and ES405
- Textbook:** None.
- Coordinator:** R. O'Brien
- Objectives:** This course acts as a capstone to the student's undergraduate education in Systems Engineering. It provides the opportunity for the students to use fundamental knowledge acquired in the preceding courses to construct a working prototype of a proposed design project. The success of the project will be evaluated against performance metrics established in the prior design proposal course (ES403).

Classroom schedule:

Project teams meet for one 50-minute advising session per week with the assigned project advisor at an arranged time for all members. The remaining allocated course time is devoted to project work in the laboratory or designated space.

Contribution of course to professional component:

This course offers students first hand exposure to design implementation. Students are immersed within a development environment experiencing such items as project timeline/deadlines, equipment procurement/maintenance, a team work environment, and proper documentation of work.

Relationship of course to program outcomes:

- Outcome (b) and (k): Upon completion of their project, students are required to perform experiments in order to demonstrate a working prototype and subsequently calculate its performance against established metrics to evaluate success.
- Outcome(c): Students critique their final project manifestation and offer suggestions for the next design iteration.
- Outcome (d) and (g): Project teams range in size from two to six. Students learn to organize work, delegate appropriately, and complete assigned tasks in a timely manner. In addition, team decisions and disagreements must be dealt with effectively so as not to jeopardize project completion.

Prepared by: R. O'Brien Date: 28 Feb 2012