SYLLABUS
PROCESSING SPACE_LAUNCH SYSTEMS
EGN 4707C

2003-2004 PR: For ECE: EEL3552 or EEL4767; For IEMS: ESI 4523; For MAE: EAS3800.
Description: Assembly and test techniques for preparing and checkout of the space launch system
“Inertial Upper Stage.” May be repeated for credit.

Credits: 3 (2, 4)
Coordinator: Dr. Ham
Goals: Learn processing requirements of space systems.
Learn to analyze satellite subsystems (i.e. electrical, mechanical, computer communication, attitude control).
Learn to create and produce design options.
Learn to work in a design group and write/present a final design report.

Prerequisites by Topic: Calibration and use of instruments and measurement procedures.
Oral and written reporting techniques.
Mathematical methods in mechanical, electrical, and aerospace engineering / computational methods.
Modeling techniques (MATLAB, G2, ORBIT WORKS, etc.)

Topics: Coordinate with processing mentors.
Write a design specification (preliminary).
Orally present design options.
Apply propulsion, guidance and control, communications, computer, power, and orbital mechanics to launcher / spacecraft processing.

Computer Usage: Application of computer simulation to orbital design for spacecraft mission.

Design: Accomplish in design teams of 3 students – Space missions (design of telemetry transmitter, orbital elements, Hohmann transfer maneuvers, number of satellites) for semi-synchronous orbit.

Technical Communication: Oral and written reports for conveying designs and analysis to Boeing and NASA engineers, and the instructors.

Ethics, Social, Economic, and Safety: Lectures and reading assignments on social impacts of engineering design and safety are given and examined in the course. Guidelines on safety standards for on site laboratory visits (laboratory exercises conducted at Cape Canaveral Air Station, CCAS, laboratories) were conducted. Costing was a factor in selection of satellite design configuration.
Projects (Individual): Take-home projects in propulsion, electrical, orbital mechanics, thermal control (space), attitude control, and telemetry.

Projects (Team): Multiple team designs for space applications. Individual presentation on portion of design project.

ABET Category: Engineering Science - 66%, Engineering Design - 34%

Class Time: Friday 9:00 a.m. – 10:30 a.m. Lectures
10:40 a.m. – 1:00 p.m. Laboratory / Field Tour

Grading Scale:
- 92~ A, 88~ A-
- 84~ B+, 80~ B, 76~ B-
- 72~ C+, 68~ C, 64~ C-
- 60~ D+, 55~ D, 50~ D-
- < 50 F

Grading:
- Midterm Exam: 20 points
- Final Exam: 35 points
- Individual Project & Homework: 15 points
- Class attendance (absence – 4 pts, tardy of 10 min – 2 pts): 10 points
- Team Project: 30 points

Total 105 points