

Engineering Faculty Document No.: 4-04
Date: January 26, 2005

TO: Faculty of Schools of Engineering
FROM: Faculty of the School of Aeronautics and Astronautics
SUBJECT: New Graduate Course

The Faculty of the School of Aeronautics and Astronautics has approved the new course listed below. This action is now submitted to the Engineering Faculty with a recommendation for approval.

AAE 535 Propulsion Design, Build, Test

Sem. 2, class 2, lab 2, cr. 3

Prerequisite: AAE 439 or consent of instructor

Course Description:

Intensive one-semester treatment of the aerospace propulsion component development process. Derivation of design requirements from mission objective to detailed components; the design process. Standard methods for thermostructural, life, performance, and combustion stability design analysis; combustor design. Experimental procedures; fabrication; test. Special topics according to student interest. Professor Anderson.

Reason:

Propulsion design, build, and test is a unique learning experience available to AAE students based on the propulsion heritage at Purdue and the test and fabrication capabilities available to students. The class was taught in Spring 2002, 2003, and 2004, with an average enrollment of approximately 20 students.

Thomas N. Farris, Professor and Head
School of Aeronautics and Astronautics

AAE 535 Propulsion Design, Build, Test

- Course Instructor: Professor William E. Anderson
- Course Description:
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- Course outline (based on Tuesday/Thursday schedule):
 1. Introduction: elements and progression of a typical propulsion system development program; types of contracts; engineering organizations; topical development issues in rocket propulsion systems. (1 mtng)
 2. Identification of potential projects, project selection, and definition of mission objectives. Assignment of roles and responsibilities. (2 mtng)
 3. The program plan. Derivation of top level requirements; requirements flowdown to component level; development of a design requirements verification matrix. Statement of Work and Work Breakdown Schedule. (1 mtng)
 4. Description of the design process. Design reviews and success criteria. Interface control documents and configuration management. Fabrication techniques. Measurement techniques. Laboratory safety and training. (3 mtng)
 5. Detailed design analysis. Conceptual design; preliminary design; and detailed design. Design analysis methods. Design reviews. (12 mtng)
 6. Fabrication, assembly, and installation. Data acquisition and control. (2 mtng)
 7. Test. Test readiness review; measurement; and data reduction. (8 mtng)
 8. Final report. (1 mtng)
- Text: Supplemental materials: The course is based on an extensive set of handouts.