TO: Faculty of Schools of Engineering
FROM: Faculty of the School of Aeronautics and Astronautics
SUBJECT: New Course (result of splitting AAE 451 into two courses)

The faculty of the School of Aeronautics and Astronautics has approved the new course listed below. This new course is a result of splitting AAE 451 into two courses (AAE 451 will be submitted as a course description change EFD 6-00). This action is now submitted to the Engineering Faculty with a recommendation for approval.

AAE 450  Spacecraft Design
Sem. 1 and 2, Class 2, lab. 3, cr. 3
Prerequisites: AAE 251, 334, 340, 352, 364 and 439
Corequisite: AAE 440

Course Description: Senior students perform a team-based spacecraft design, requiring application of the education and skills developed in the aerospace curriculum. Components include analysis methods for preliminary design, development of an initial vehicle concept, and development of a complete numerical model of the mission, culminating in oral and written reports by the teams.

Reason: Students may take either aircraft design or spacecraft design to fulfill the capstone design requirement. Having separate course numbers is a necessary part of the School's astronautics initiative.

[Signatures and approvals]

Thomas N. Farris, Professor and Head
School of Aeronautics and Astronautics
AAE 450
Spacecraft Design

1. Justification: Students may take either aircraft design or spacecraft design to fulfill the capstone design requirement. Having separate course numbers is a necessary part of the School's aeronautics initiative.

2. Level: Senior

3. Prerequisites: AAE 251, 334, 340, 352, 364, and 439.
   Corequisite: AAE 440

4. Course Description
   Senior students perform a team-based spacecraft design, requiring application of the education and skills developed in the aerospace curriculum. Components include analysis methods for preliminary design, development of an initial vehicle concept, and development of a complete numerical model of the mission, culminating in oral and written reports by the teams.

5. Course Instructor: Steven P. Schneider

6. Course Outline

   a. Analysis Methods to be used for Preliminary Spacecraft Design

   b. Development of an Initial Vehicle Concept
      Selection is based on historical background and engineering judgement, plus qualitative studies of vehicle requirements, mission goals, and possible vehicle concepts. The vehicle concept will include a number of free parameters, such as vehicle length, slenderness, mass, tank position, and so on. First formal report.

   c. Development of a Numerical Model for the Vehicle Concept
      Based on sections (a) and (b), a numerical model must be coded and checked. The concept in section (b) must be simple and specific, so that it is feasible to develop this model in the time available. Validation of model for second formal report.

   d. Configure Vehicle using Trade Studies based on the Simulations
Quantitative trade studies performed using the model. Selection of final configuration. Reporting of vehicle characteristics and performance. Final report.

7. Text (Principal References)


