Major Department Curriculum Change Form  
CEAS B.S. Undergraduate Programs

For B.S. in: [Aerospace Engineering]  
Effective for which Fall Semester? [Fall 2013]

DATE SUBMITTED TO ASSOCIATE DEAN FOR EDUCATION: [10/02/12]  
(NOTE: Form should be submitted at least one year before the proposed curriculum change will be implemented.)

SUBMITTED BY: [Scott Palo, Chair of ASEN Undergraduate Committee]

Summary and justification of proposed change(s):

To remove the requirement of CHEN 1211/CHEM 1221 for ASEN students and replace it with a new aerospace materials course that includes the basic chemistry and materials science content relevant for the aerospace discipline.

ABET does not require chemistry for aerospace engineering programs but rather states “Aeronautical engineering programs must prepare graduates to have a knowledge of aerodynamics, aerospace materials, structures, propulsion, flight mechanics and stability and control”. CHEN 1211/CHEM 1221 covers significantly more content than what is necessary for aerospace majors. Students and alumni have indicated that time spent on these general chemistry concepts would be better utilized covering aerospace specific content. This change has been endorsed by the Aerospace Undergraduate Committee and the Aerospace External Advisory Board.

The proposed new materials course (ASEN 1022) will obsolete the current materials course (ASEN 4012) which will allow ASEN students to learn aerospace materials and materials selection prior to Senior Projects as the current course (ASEN 4012) is taken in the senior year concurrently with Senior Projects. It is expected that this change will allow a new professional area elective in aerospace materials.

The new materials course will be offered in the spring semester and will be a prerequisite for Senior Projects which will allow flexibility for students who transfer into the ASEN major to complete the course either in the spring semester of the freshmen, sophomore or even the junior year. The prerequisite for the new materials course will be high school chemistry. If the student did not take chemistry in high school, they will take remedial chemistry (CHEM 1021) in the fall of the freshman year. The new materials course, ASEN 1022 was approved as a pilot for spring 2013 with a plan to be a requirement for all students who matriculate starting fall 2014. Two of the 5 credits from Chemistry will be added as a PAE in fall of the sophomore year and 3 PAE credits in the spring of the junior year. It is expected that these 3 PAE credits will be moved into a required upper division aerospace software development class at some time in the next 2 years.

How does the proposed change(s) impact Article III.2 “Four-Year Graduation Guarantee and Flexible First Year” of the College Rules?

This change will not impact the Four-Year Graduation Guarantee and Flexible First Year. Students who are unsure of their major selection will be advised to take CHEN 1211/CHEM 1221 in the fall of their freshman year in case they want to change to a chemistry requiring major. The Aerospace Engineering Sciences
program will accept CHEN 1211-3/CHEM 1211-2 a Free Elective. Therefore any students who take CHEN 1211-3/CHEM 1211-2 can count this credit towards their major degree requirements.

As of Fall 2012 (catalog year), CHEN 1211/CHEM 1211 is no longer a prerequisite for any ASEN courses but is rather only a graduation requirement. A subset (up to 50) Aerospace fall 2012 matriculates are taking our pilot material science course this spring with the remainder of the freshman taking CHEN 1211/CHEM 1211. Students who matriculated with chemistry credit were encouraged to take the new aerospace materials course.

How does the proposed change(s) impact a student starting in your major if he/she changes to any of the other majors in the College? (See nominal 8-semester sample curricula for each major under “Degree Programs” posted at www.colorado.edu/engineering/academics.)

If an ASEN major decides to switch their major during the freshmen year, they will need to take CHEN 1211 & CHEM 1221 if they switch to CHEN, CBEN, CVEN or EVEN. All students will be clearly advised that if they have any interest in changing to a chemistry requiring engineering major, and meet the four year guarantee, they must complete CHEN 1211 & CHEM 1221 before the start of their sophomore year.

Students who transfer into ASEN are eligible to take ASEN 1022 Materials for Aerospace in the spring of their sophomore year or junior year.

How does the proposed change(s) impact enrollments and facilities outside your major department? Please include any new restrictions (e.g., major restriction) that are proposed for your department/program courses.

Changing our curriculum will impact both the Chemical Engineering and Chemistry departments as Aerospace Students will no longer be required to take CHEN 1211 & CHEM 1221.

Please attach a nominal “before” and “after” 8-semester sequence for the curriculum.

Associate Dean for Education Decision & Date: ______________________________

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If approved, copies of this form will be sent to: Major Department Undergraduate Curriculum Committee, Undergraduate Education Council, Administrative Council plus BS Program Chairs, and relevant Chairs of affected departments outside the college.