



College of Engineering

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Date: 24 May 2007

To: Randy Smith  
Vice Provost, Office of Academic Affairs

From: Ed McCaul  
Secretary College of Engineering Committee on Academy Affairs

Subject: Changes to the Aerospace Engineering Undergraduate Curriculum

Attached is a copy of the Department of Aerospace Engineering's proposed change to their undergraduate curriculum. After a review and discussion the College's Committee on Academic Affairs (CCAA) unanimously approved this proposal on the 23<sup>rd</sup> of May 2007. Aerospace has stated that the Math Department is aware of these proposed changes. If you have any questions concerning this proposal please let me know.

To: Core Committee & College Committee on Academic Affairs  
From: Aerospace Engineering  
Re: Change in Undergraduate Curriculum  
Date: March 27, 2007

The Department of Aerospace Engineering periodically reviews its program based on student performance among many factors. One problematic area has been the mathematical ability of our undergraduate students and in particular the applications of mathematical methods to engineering problems. It was observed that there was a disconnect between what was taught in mathematics courses and the use of this material in engineering courses taught in our department.

To remedy this problem, it was decided that a better method might be to team teach some of the mathematics and engineering material so that students could immediately apply what was taught in mathematics to engineering problems. Aero 414(2) and Math 414(3) were the result of this approach, but after seven years of this combination the results are not good. While some students seem to like this approach and do well, the majority of students are dissatisfied and their performance is worse than under the traditional system. The attached bingo sheet marked **Current** shows the present math sequence.

An additional problem concerns Math 571(3) in which it was hoped students would get the basics of matrix algebra and eigenvalues. The last topic is actually not covered and many of the topics in Math 571(3) are often not covered because of lack of time. As such, it is not really serving any useful purpose for aero students.

Based on the above observations, it was felt that it was time to revisit the acquisition of math expertise by our students. The result of this effort is shown in the bingo sheet marked **New**. The rationale is as follows;

- 1) Drop Math 414(3) and Aero 414(2) since they are not working and Math 571(3) since it is not serving our curriculum requirements content wise.
- 2) Add Math 415(4) in place of Math 414(3). Math 415 satisfies the Selected Core requirement in Ordinary Differential Equations of the College.
- 3) Make Aero 580(4) a required course as its topics cover the applications taught in Aero 414(2) plus additional topics not covered in Math 571(3).

It should be noted that the total Aero credit hours remain exactly the same as with the Current course sequence.

**Aerospace Engineering CURRENT BINGO SHEET**  
**2006-2007**

Name: \_\_\_\_\_ Student ID: \_\_\_\_\_ Phone: \_\_\_\_\_

New to OSU: \_\_\_\_\_ email: \_\_\_\_\_@osu.edu

YEAR	AUTUMN	WINTER	SPRING
1	Math 151 (Calc & Anal Geom) ..... 5 _____ Chem 121 (Gen Chem) ..... 5 _____ Eng 181 (Intro to Eng I) ..... 3 _____ Eng 100 (Eng Survey) ..... 1 _____	Math 152 (Calc & Anal Geom) ..... 5 _____ Physics 131 (Particles & Motion) .... 5 _____ Eng 183 (Intro to Eng II) ..... 3 _____	Math 153 (Calc & Anal Geom) ..... 5 _____ Physics 132 (Elec & Mag) ..... 5 _____ EnGraph 167 (Prob Solv & Progr).. 4 _____
2	<b>AAE 200</b> (Intro to AAE I) ..... 5 _____ Math 254 (Calc & Anal Geom) ..... 5 _____ Physics 133 (Waves & Quant Phy). 5 _____	<b>AAE 201</b> (Intro to AAE II) ..... 5 _____ ME 410 (Statics) ..... 4 _____ MSE 205 (Intro to MSE) ..... 3 _____	<b>AAE 405</b> (Thermodynamics) ..... 4 _____ <b>AAE 414</b> (App of Diff Equa in AAE).. 2 _____ <b>Math 414</b> (Diff Equa for Eng Appl)... 3 _____ Math 571 (Linear Algebra) ..... 3 _____ ME 430 (Dynamics) ..... 4 _____
3	<b>AAE 542</b> (Flight Vehicle Struc I) .... 4 _____ <b>AAE 520</b> (Flight Vehicle Dynamics).. 4 _____ <b>AAE 530</b> (One-Dim Gasdynamics) .. 4 _____ <b>AAE 512</b> (Systems Integration I) .... 1 _____ ISE 504 (Eng Econ Analysis) ..... 3 _____	<b>AAE 543</b> (Flight Vehicle Struc II) .... 4 _____ <b>AAE 521</b> (Linear Systems Eng) ..... 4 _____ <b>AAE 560</b> (Fund of Aerodynamics) ... 4 _____ <b>AAE 513</b> (Systems Integration II) .... 1 _____	<b>AAE 581</b> (Num Methods in AAE) ... 3 _____ <b>AAE 570</b> (Visc Flow & Heat Trans) .. 4 _____ <b>AAE 550</b> (Princ Flight Vehcl Prop) ... 4 _____ <b>AAE 514</b> (Systems Integration III) 1 _____ EE 300 (Electrical Circuits) 3 _____ EE 309 (Electrical Circuits Lab) 1 _____
4	<b>AAE 510.01</b> †(AAE Lab I)..... 2 _____ <b>AAE 515</b> (Prelim Des Flight Veh).... 3 _____ <b>AAE Tech Elective</b> ..... 3 _____	<b>AAE 510.02</b> †(AAE Lab II) ..... 2 _____ <b>AAE 516</b> (Prelim Des Flight Veh) .... 3 _____ <b>AAE Technical Elective</b> ..... 3 _____	<b>AAE 510.03</b> † (AAE Lab III) ..... 2 _____ <b>AAE 517</b> (Detailed Des Flight Veh) .. 2 _____ <b>AAE Technical Elective</b> ..... 3 _____

**All AAE and Courses printed in BOLD are taught one quarter per year**

Please check On-line Course Offerings for availability of other courses

GENERAL EDUCATION (45 hrs)  
 English & Communication Skills (10)  
 English 110 (5) \_\_\_\_\_  
 2<sup>nd</sup> Writing Course (5) \_\_\_\_\_

Social Sciences (9) a+b, a+c, or b+c  
 a. \_\_\_\_\_ ( ) \_\_\_\_\_  
 b. \_\_\_\_\_ ( ) \_\_\_\_\_  
 c. \_\_\_\_\_ ( ) \_\_\_\_\_

Historical Survey (10) sequence  
 \_\_\_\_\_ ( ) \_\_\_\_\_  
 \_\_\_\_\_ ( ) \_\_\_\_\_

Arts & Humanities (9)  
 a. Literature (1 course)  
 \_\_\_\_\_ ( ) \_\_\_\_\_

b. Visual/Performing Arts or  
 Other Humanities (1 course)  
 \_\_\_\_\_ ( ) \_\_\_\_\_

ADMISSION CONDITION  
 (Does not apply to everyone)  
 \_\_\_\_\_ ( ) \_\_\_\_\_

SOCIAL DIVERSITY Underlined  
 (May overlap with another GEC Category)  
 \_\_\_\_\_ ( ) \_\_\_\_\_

AERO ELECTIVES (9)† 600-700 Level  
 \_\_\_\_\_ ( ) \_\_\_\_\_  
 \_\_\_\_\_ ( ) \_\_\_\_\_  
 \_\_\_\_\_ ( ) \_\_\_\_\_

Sub-total Core ..... 142  
 General Education ..... 38  
 Technical Electives ..... 9  
 TOTAL HOURS ..... 189

† Satisfies 3rd writing course requirement

Acceptance into the Aerospace Engineering major will depend on the cumulative point-hour ration (CPHR) and the secondary point-hour ratio (SPHR) upon completion of the following pre-major courses: *Chemistry 121, English 110, Engineering 181, 183, Physics 131, 132, 133, En Graph 167, Mech Eng 410, Math 151, 152, 153, 254, and AAE 200*. A minimum SPHR of 2.0 is required. Students with a CPHR of 3.0 are assured of acceptance. Formal application is accepted all quarters. Contact departmental office (BO 328) for details.

**Aerospace Engineering NEW BINGO SHEET**  
2007-2008

Name: \_\_\_\_\_ Student ID: \_\_\_\_\_ Phone: \_\_\_\_\_

New to OSU: \_\_\_\_\_ email: \_\_\_\_\_@osu.edu

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3	<b>AAE 542</b> (Flight Vehicle Struc I) .... 4 _____ <b>AAE 520</b> (Flight Vehicle Dynamics).. 4 _____ <b>AAE 530</b> (One-Dim Gasdynamics) .. 4 _____ <b>AAE 581</b> (Analy Methods in AAE) ... 3 _____ <b>AAE 512</b> (Systems Integration I) .... 1 _____	<b>AAE 543</b> (Flight Vehicle Struc II) .... 4 _____ <b>AAE 560</b> (Fund of Aerodynamics) ... 4 _____ <b>AAE 513</b> (Systems Integration II) .... 1 _____ EE 300 (Electrical Circuits)..... 3 _____ EE 309 (Electrical Circuits Lab)..... 1 _____	<b>AAE 570</b> (Visc Flow & Heat Trans) .. 4 _____ <b>AAE 550</b> (Princ Flight Vehcl Prop) ... 4 _____ <b>AAE 521</b> (Linear Systems Eng)..... 4 _____ <b>AAE 514</b> (Systems Integration III)... 1 _____
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English 110 (5) \_\_\_\_\_  
2<sup>nd</sup> Writing Course (5) \_\_\_\_\_

Social Sciences (9) a+b, a+c, or b+c  
a. \_\_\_\_\_ ( ) \_\_\_\_\_  
b. \_\_\_\_\_ ( ) \_\_\_\_\_  
c. \_\_\_\_\_ ( ) \_\_\_\_\_

Historical Survey (10) sequence  
\_\_\_\_\_ ( ) \_\_\_\_\_  
\_\_\_\_\_ ( ) \_\_\_\_\_

Arts & Humanities (9)  
a. Literature (1 course)  
\_\_\_\_\_ ( ) \_\_\_\_\_

b. Visual/Performing Arts or  
Other Humanities (1 course)  
\_\_\_\_\_ ( ) \_\_\_\_\_

ADMISSION CONDITION  
(Does not apply to everyone)  
\_\_\_\_\_ ( ) \_\_\_\_\_

SOCIAL DIVERSITY Underlined  
(May overlap with another GEC Category)  
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\_\_\_\_\_ ( ) \_\_\_\_\_  
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