



Michigan**Engineering**

**2011-12 Curricular Effectiveness Indicators for  
Aerospace Engineering (Aero)**

Triangulation of the Most Recent Student & Alumni Perceptions  
for Selected Curricular Outcomes:  
Problem-solving and Communication

The Office of Student Affairs  
University of Michigan, College of Engineering  
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# 2011-12 Curricular Effectiveness Indicators for Aerospace Engineering (Aero)

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## Purpose and Approach

The purpose of this report is to triangulate the most recent available data from three data sources on two selected curricular outcomes: problem solving and communication. The data sources are the Fall 2011 Course Evaluations, the 2010-2011 Senior Surveys and the 2010-2011 Alumni Surveys (for alumni graduating in 2008).

Indicators related to two of the 11 ABET outcomes (a-k) are presented: one technical outcome [(e) an ability to identify, formulate, and solve engineering problems] and one non-technical outcome [(g) an ability to communicate effectively]. In future years, additional outcomes will be selected and presented.

## Results and Discussion

The three graphs triangulate to give an indication of recent student/alumni opinions of selected curricular outcomes:

1) Five selected questions (Q15, Q23, Q26, Q27, and Q28) from the **Fall 2011 Course Evaluations** show how students throughout the CoE felt *about improvement in specific skills in the courses in which they were enrolled*. The averages for CoE overall fall between 'neutral' and a bit above 'agree' with regard to a statement about skill improvement in each area. Note that this important data would be more robust if more faculty included questions 15 through 35 on their course evaluations. Some of these questions were asked more frequently than others (the most frequent was asked in only 48% of the 854 CoE sections submitting Fall 2011 Course Evaluations, the least frequent by 7% of the CoE sections).

2) In the **2010-11 Senior Surveys**, the seniors evaluated the *emphasis in the entire curriculum* for the skills in question. The averages for preparation for the CoE overall each fall in the range between 3 = "adequate", 4 = "good", and 5 = "excellent".

3) In the **Alumni Survey** of all year 2008 bachelor's degree graduates, the alumni *considered their undergraduate curriculum in light of their two years of subsequent experience*. Responding alumni for CoE overall noted that communication skills are approximately as important as engineering problem-solving skills. CoE alumni's average rating of their preparation in engineering problem solving skills (4.34) and communication skills (3.87) should be interpreted on their response scale, where 3 = 'adequate preparation', 4 = 'good preparation' and 5 = 'excellent preparation'.

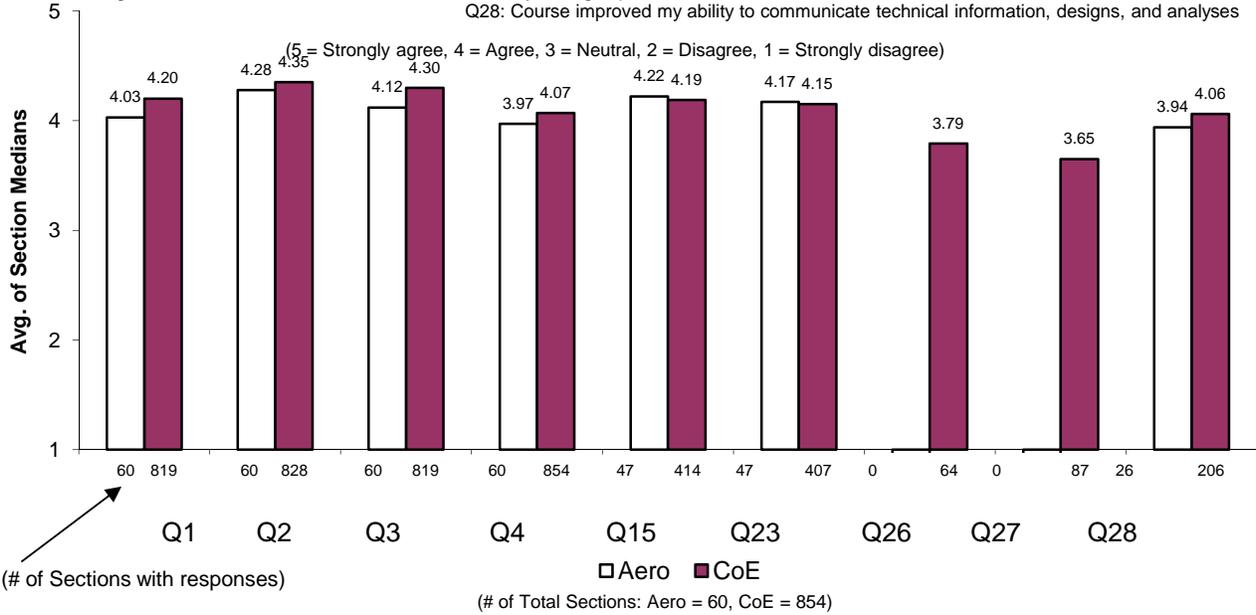
Although higher response rates are desirable, several years of data support the idea that an individual's opinions may change after graduation, when they better understand the complete complement of skills that must be coordinated in the workplace or graduate school. Alumni perceive that non-technical skills are important and that their undergraduate preparation in these areas is weaker than in the technical skill areas.

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**Course Evaluations: Aero - Fall 2011**

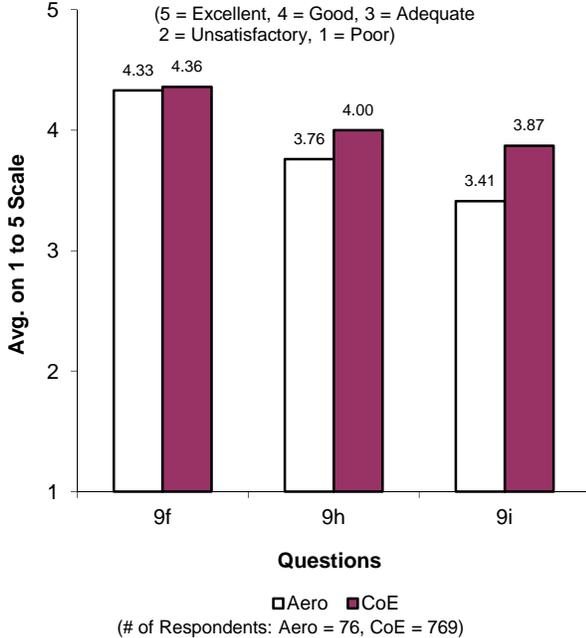
Q1: Overall, this was an excellent \*course\*  
 Q2: Overall, the \*instructor\* was an excellent teacher  
 Q3: I learned a great deal from this \*course\*  
 Q4: I had a strong desire to take this course

Q15: I increased my ability to apply math and science knowledge to engineering problems  
 Q23: I increased my ability to formulate and solve engineering problems  
 Q26: My oral communication skills improved because of this course  
 Q27: My writing improved because of this course  
 Q28: Course improved my ability to communicate technical information, designs, and analyses



**Senior Survey: Aero - 2010-11**

How well did your UM undergraduate program prepare you in:  
 Q9f: engineering problem-solving skills  
 Q9h: written communication skills  
 Q9i: oral communication skills  
 (5 = Excellent, 4 = Good, 3 = Adequate, 2 = Unsatisfactory, 1 = Poor)



**Alumni Survey: Aero - Graduating Class of 2008**

Importance: How important it is in your professional experience  
 Preparation: How well the UM undergraduate program prepared you

