BAEM GRADUATES
AEROSPACE ENG & MECH
SPRING 2006

Course: AEM
Term: 20
Form: CUSTOM SURVEY FORM
Item Key: 0500032

Following are your survey results. For each item the number responding to each alternative is listed at the end of the bars. In addition each response percentage is listed in parentheses and is calculated using the number of responses to the item. The mean, median, and standard deviation also are listed.

The mean is the average rating of an item. Each response is assigned an integer weight (number in parentheses in front of each bar), such as 1 through 5, or 1 through 7; the mean is then calculated on all responses to the item using the response weights. The mean is a good measure for summarizing results if the distribution of responses approximates a bell-shaped curve.

The median indicates the mid-point of the item responses. It is the point at which 50% of the responses are higher and 50% are lower. The median can be more important than the mean in summarizing results, especially if the distribution does not approximate a bell-shaped curve, but appears to have a long tail at one end or the other. Sometimes with small numbers of respondents, the mean or median may hide important differences in opinions, for example if 1/2 circled 1 and 1/2 circled 7, then the resultant mean and median of 4 would mask an important difference.

The standard deviation can be used as an index of consensus among the responses; the lower the standard deviation, the greater the similarity of responses--generally on a 5 to 7-point scale, a standard deviation of 0.8 to 1.0 or less can be considered low. Items with the highest standard deviation indicate items for which the responses are the most spread-out.

The frequency distributions and graphs provide you with the exact information as to how the respondents answered each item.

Please note the percentage of responses to each item. The further away from 100%, the more you are dealing with the opinions of only a portion of the group. If there were only a few responses to an item, you probably should disregard it.

The options column lists the various response alternatives that are available on different general purpose answer sheets. They are listed as reference to the integer weight assigned to each alternative.

When you are studying these results, be careful not to overinterpret them. Differences between means of less than one-half to three-quarters of a point are not meaningful in a practical sense; the biggest differences are the most trustworthy.

If you have any questions about your results, please feel free to contact us.
<table>
<thead>
<tr>
<th>Items</th>
<th>Options</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My ed has prepared me: to apply knowledge of math, science, eng fundamentals...</td>
<td>Strg Disagree (1)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>2 (4.9%)</td>
</tr>
<tr>
<td></td>
<td>Agree (4)</td>
<td>21 (51.2%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>16 (39.0%)</td>
</tr>
<tr>
<td>2. ...to design and conduct experiments and to analyze and interpret data.</td>
<td>Strg Disagree (1)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>2 (4.9%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>5 (12.2%)</td>
</tr>
<tr>
<td></td>
<td>Agree (4)</td>
<td>27 (65.9%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>7 (17.1%)</td>
</tr>
<tr>
<td>3. ...to design a system, component, or process to meet desired needs.</td>
<td>Strg Disagree (1)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>2 (4.9%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>6 (14.6%)</td>
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<tr>
<td></td>
<td>Agree (4)</td>
<td>25 (61.0%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>8 (19.5%)</td>
</tr>
<tr>
<td>4. ...to use modern tools (e.g. CAD) necessary for engineering practice.</td>
<td>Strg Disagree (1)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>2 (4.9%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>3 (7.3%)</td>
</tr>
<tr>
<td></td>
<td>Agree (4)</td>
<td>24 (58.5%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>12 (29.3%)</td>
</tr>
<tr>
<td>5. ...to identify, formulate and solve engineering problems.</td>
<td>Strg Disagree (1)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>4 (9.8%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>7 (17.1%)</td>
</tr>
<tr>
<td></td>
<td>Agree (4)</td>
<td>20 (48.8%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>10 (24.4%)</td>
</tr>
<tr>
<td>6. ...has given me a good understanding of professional and ethical responsibilities.</td>
<td>Strg Disagree (1)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>4 (9.8%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>7 (17.1%)</td>
</tr>
<tr>
<td></td>
<td>Agree (4)</td>
<td>20 (48.8%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>10 (24.4%)</td>
</tr>
<tr>
<td>7. ...to communicate effectively, in both oral and written form.</td>
<td>Strg Disagree (1)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>3 (7.3%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>12 (29.3%)</td>
</tr>
<tr>
<td></td>
<td>Agree (4)</td>
<td>19 (46.3%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>6 (14.6%)</td>
</tr>
<tr>
<td>8. ...has prepared me to understand the impact of technology on society.</td>
<td>Strg Disagree (1)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>5 (12.2%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>11 (26.8%)</td>
</tr>
<tr>
<td></td>
<td>Agree (4)</td>
<td>19 (46.3%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>6 (14.6%)</td>
</tr>
<tr>
<td>9. ...has provided me with the fundamentals for continued learning throughout life.</td>
<td>Strg Disagree (1)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>3 (7.3%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>5 (12.2%)</td>
</tr>
<tr>
<td></td>
<td>Agree (4)</td>
<td>25 (61.0%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>8 (19.5%)</td>
</tr>
<tr>
<td>10. My education has given me an appreciation of the societal context in which ...</td>
<td>Strg Disagree (1)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>2 (4.9%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>13 (31.7%)</td>
</tr>
<tr>
<td></td>
<td>Agree (4)</td>
<td>18 (43.9%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>7 (17.1%)</td>
</tr>
<tr>
<td>11. The basic science component of my eng ed prepared me well for my major courses.</td>
<td>Strg Disagree (1)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Disagree (2)</td>
<td>2 (4.9%)</td>
</tr>
<tr>
<td></td>
<td>Neutral (3)</td>
<td>10 (24.4%)</td>
</tr>
<tr>
<td></td>
<td>Agree (4)</td>
<td>23 (56.1%)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree (5)</td>
<td>6 (14.6%)</td>
</tr>
</tbody>
</table>
12. The basic math component of my engineering course was well prepared for my major courses.
   Mean = 3.78  Median = 3.92
   Standard Deviation = 0.95
   Responses to item = 41 (100.0%)

13. The lower division academic advising at the University of Maryland was good.
   Mean = 2.98  Median = 3.00
   Standard Deviation = 1.00
   Responses to item = 41 (100.0%)

14. The computational facilities available for my coursework and projects were good.
   Mean = 3.63  Median = 3.75
   Standard Deviation = 0.89
   Responses to item = 40 (97.6%)

15. Instructors were available to discuss course-related issues outside of class.
   Mean = 3.95  Median = 4.00
   Standard Deviation = 0.84
   Responses to item = 40 (97.6%)

16. My courses included active learning experiences, such as discussion and team projects.
   Mean = 4.07  Median = 4.09
   Standard Deviation = 0.68
   Responses to item = 41 (100.0%)

17. The upper division academic advising for the BAEM program was good.
   Mean = 3.29  Median = 3.44
   Standard Deviation = 1.19
   Responses to item = 41 (100.0%)

18. My education provided me with a good understanding of engineering materials.
   Mean = 3.88  Median = 3.96
   Standard Deviation = 0.77
   Responses to item = 41 (100.0%)

19. With a good understanding of aerodynamics.
   Mean = 4.24  Median = 4.36
   Standard Deviation = 0.88
   Responses to item = 41 (100.0%)

20. With a good understanding of aerospace structures.
   Mean = 3.88  Median = 3.98
   Standard Deviation = 0.80
   Responses to item = 41 (100.0%)

21. With a good understanding of aerospace propulsion systems.
   Mean = 3.95  Median = 4.07
   Standard Deviation = 0.92
   Responses to item = 41 (100.0%)

22. With a good understanding of atmospheric flight mechanics.
   Mean = 4.32  Median = 4.34
   Standard Deviation = 0.84
   Responses to item = 41 (100.0%)

Options:

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Responses:

- 1
- 6 (14.6%)
- 6 (14.6%)
- 20 (48.8%)
- 9 (22.0%)

- 1
- 3 (7.3%)
- 10 (24.4%)
- 15 (36.6%)
- 11 (26.8%)

- 1
- 2 (4.9%)

- 1
- 1 (2.5%)
- 3 (7.5%)
- 11 (27.5%)
- 20 (50.0%)

- 1
- 5 (12.5%)

- 1
- 2 (5.0%)

- 1
- 2 (4.9%)

- 1
- 28 (68.3%)

- 1
- 9 (22.0%)

- 1
- 9 (22.0%)

- 9 (22.0%)

- 1
- 3 (7.3%)

- 3 (7.3%)

- 6 (14.6%)

- 25 (61.0%)

- 1
- 2 (4.9%)

- 1
- 2 (4.9%)

- 3 (7.3%)

- 13 (31.7%)

- 7 (17.1%)

- 1
- 2 (4.9%)

- 1
- 2 (4.9%)

- 3 (7.3%)

- 18 (43.9%)

- 18 (43.9%)

- 1
- 2 (4.9%)

- 2 (4.9%)

- 3 (7.3%)

- 23 (57.5%)

- 10 (25.0%)

- 1
- 0 (0.0%)

- 4 (9.8%)

- 4 (9.8%)

- 26 (63.4%)

- 7 (17.1%)

- 1
- 0 (0.0%)

- 3 (7.5%)

- 5 (12.2%)

- 16 (39.0%)

- 18 (43.9%)
Items:

23. ...with a good understanding of orbital mechanics and space flight.
   Mean = 4.00  Median = 4.14
   Standard Deviation = 1.01
   Responses to item = 41 (100.0%)
   Options: Strg Disagree (1) 2( 4.9%)
   Disagree (2) 6(14.6%)
   Neutral (3) 18(43.9%)
   Agree (4) 14(34.1%)
   Strongly Agree (5)

24. ...with a good understanding of flight dynamics and control.
   Mean = 3.95  Median = 4.00
   Standard Deviation = 0.79
   Responses to item = 41 (100.0%)
   Options: Strg Disagree (1) 0( 0.0%)
   Disagree (2) 2( 4.9%)
   Neutral (3) 8(19.5%)
   Agree (4) 21(51.2%)
   Strongly Agree (5) 10(24.4%)

25. The design experiences provided throughout the BAEM curriculum were good.
   Mean = 3.65  Median = 3.85
   Standard Deviation = 0.99
   Responses to item = 40 (97.6%)
   Options: Strg Disagree (1) 0( 0.0%)
   Disagree (2) 8(20.0%)
   Neutral (3) 15(38.5%)
   Agree (4) 7(17.5%)
   Strongly Agree (5) 7(17.5%)

26. The intern and/or work experiences enhanced my education.
   Mean = 3.57  Median = 3.33
   Standard Deviation = 0.84
   Responses to item = 35(85.4%)
   Options: Strg Disagree (1) 0( 0.0%)
   Disagree (2) 1( 2.9%)
   Neutral (3) 14(35.9%)
   Agree (4) 7(17.5%)
   Strongly Agree (5) 7(17.5%)

27. The quality of laboratory facilities provided by the BAEM program was good.
   Mean = 3.03  Median = 3.15
   Standard Deviation = 0.95
   Responses to item = 39 (95.1%)
   Options: Strg Disagree (1) 3( 7.7%)
   Disagree (2) 5( 12.8%)
   Neutral (3) 14(35.9%)
   Agree (4) 14(35.9%)
   Strongly Agree (5)

28. The quality of computational facilities provided by the BAEM program was good.
   Mean = 3.33  Median = 3.32
   Standard Deviation = 1.02
   Responses to item = 39 (95.1%)
   Options: Strg Disagree (1) 0( 0.0%)
   Disagree (2) 6(15.0%)
   Neutral (3) 7(17.5%)
   Agree (4) 20(50.0%)
   Strongly Agree (5)

29. The senior design courses improved my ability to work as part of a team.
   Mean = 3.70  Median = 3.85
   Standard Deviation = 0.93
   Responses to item = 40 (97.6%)
   Options: Strg Disagree (1) 1( 2.5%)
   Disagree (2) 5(12.5%)
   Neutral (3) 7(17.5%)
   Agree (4) 23(57.5%)
   Strongly Agree (5) 4(10.0%)

30. The hands on laboratory experiences provided me with a good understanding of ....
   Mean = 3.60  Median = 3.80
   Standard Deviation = 0.92
   Responses to item = 40 (97.6%)
   Options: Strg Disagree (1) 0( 0.0%) 2005 (1) 0( 0.0%)
   Disagree (2) 6(15.0%) 2006 (2) 0( 0.0%)
   Neutral (3) 7(17.5%) Other (3) 0( 0.0%)
   Agree (4) 20(50.0%) 32(100.0%)
   Strongly Agree (5) 4(10.0%)

31. When will you receive the BAEM degree from the University of Minnesota?
   Mean = 2.00  Median = 2.00
   Standard Deviation = 0.80
   Responses to item = 32 (78.0%)
   Options: 1-A-T (1) 0( 0.0%) 1-A-T (1) 0( 0.0%)
   2-B-F (2) 0( 0.0%) 2-B-F (2) 0( 0.0%)
   3-C (3) 0( 0.0%) 3-C (3) 0( 0.0%)
   4-D (4) 0( 0.0%) 4-D (4) 0( 0.0%)
   5-E (5) 0( 0.0%) 5-E (5) 0( 0.0%)

32. Mean = 0.00  Median = 0.00
   Standard Deviation = 0.00
   Responses to item = 0 (0.0%)
After Graduation I will…

Serve as an officer in the US Airforce: Wright-Patterson AFB, OH; Astronautical Engineering

Graduate School at Purdue to study rocket propulsion

Attending graduate school

Commission in Navy as an officer/pilot

Attend grad school

Attend grad school, for at least a master’s degree

I don’t know yet

Acquire a position within an aerospace company

Work

Attend graduate school

Still look for a job. Eventually I will continue with grad school.

Grad school → Industry experience → teach

Take one year off from full time school, take some physics courses, find a job. After one year I will head to a physics masters/PhD program.

Work for Boeing

Military Service

Find a job in Aerospace

Have an internship for the summer and then come back to the U of M for grad school

Undecided

Obtain an internship (in progress) and attend graduate school in the fall.

Attend graduate school at the University of Minnesota.
Fly airplanes for the United States Air Force.

I will try to get into NASA or some other space program around the world.

Plan to work for Boeing in Seattle. I have interviews pending at the moment.

Have an engineering position focusing in machine/tool design.

Find a job in the field of Aerospace Engineering. I will continue my education for a masters at the U of M later in my career.

Intern with the Army Research Laboratory in Aberdeen, Maryland and then possibly continue on to graduate school with a focus in computational fluid dynamics.

Continue working with Honeywell full-time, then retire from industry to teach next generation engineers.

Attend 3-4 years at Lockhead-Martin. Then I will attend grad school, studying space systems further.

Possibly graduate studies.

Commission into the Air Force and go on to pilot training.

**Other Comments…**

I couldn’t understand the English spoken by half of my TA’s. The lab equipment hardly ever functioned properly, and we wasted more time waiting for TA’s/Professors to fix it than we spent learning. My upper division advisor was happy to just check off my plans instead of taking the time to make sure all of my courses were actually correct. The space design class taught me little or nothing about space design. More oral presentations would have been helpful.

The **space** component of the aerospace degree is very lacking, and provides very few options for students wishing to pursue space studies further.

My lower division was not done at the U. There needs to be 24/7 facilities and better computers for analysis projects. I never met my advisor, and have just started my internship. There is old equipment and unprepared TA’s.

I would like more experience working with real controller/microcomputers.

It would interest me to know more about careers earlier in the program. Currently Pro-E experience, structural FEM, and controls knowledge are very desirable in the job market. I would have made other choices in my program. A 5-year plan would be better to prepare me.
Lectures associated with the labs were never very good. I spent all four years “lost” in where I fit in the industry. Homework was almost never helpful. In high school I learned by doing the homework, but here it usually had little to do with lecture and the texts were pretty terrible for further information. The mathematics department was awesome, however, in choosing relevant coursework for grades. It might be helpful to see how they handle text issues.

Overall I enjoyed my education. One thing that would help is better preparation for AEM 4602 (the TA’s, course material, and guidance). One major thing that would be of great help is to make internships mandatory or more available to us.

Upper division advising was a waste of time, my advisor did not know or did not care about the degree requirements. So there was no clear path for questions until I found Professor Shield. Otherwise I was always pointed toward the front office with my questions and it is not their job to know. Lab equipment used in 4601 provided almost every team with bad data, this is unacceptable. Please generate more support or resources for maintaining equipment. Education in AEM did not provide any mechanical background to students, many graduating seniors are mechanically challenged.

I believe there could have been more time devoted to CAD work and instruction. The upper division advised me to take thermal later than I planned and made my tech elective of Intro to Combustion very difficult. An introductory course during freshman-sophomore years would be a benefit.

I feel the spaceflight semester for senior design could be improved. I feel I didn’t learn much about aspects of a spaceflight mission and our design project was too vague of a concept. I also wish there was a beginners class for MATLAB.

Most frustrating aspect of my experience here were the laboratories. The majority of the time, labs or equipment/materials didn’t work correctly and wasted a lot of time. TA’s for labs also weren’t as prepared and always had to get a lab technician.

Help in finding an internship/job/research assistant position early on would have been nice. There were many opportunities available I was not aware of at the time.

Lower division advising needs more info available prior to sessions (what students commonly do wrong). For this major there were a good number of science and math courses required, but not used after. Not all instructors were very available (more worried about their own research, grants, etc.).

Better advising for transfer students, especially those involved in a dual degree program. Have at least one advisor that is well versed in the dynamics of the dual degree program would have improved part of my experience. More up front resources/information for transfer students, especially when it comes to getting to know faculty and getting research assistanceships.
Transition from lower division honors could have been smoother. Two of the biggest problems with the program were the lack of software training and more thorough exposure to matlab as well as an introductory course in Pro-E.

The upper division advising really wasn’t poor, it just flat out did not exist. There was no help for any questions asked; I was left for myself to determine if I would even graduate on time.

Advising was somewhat impersonal. I learned more in research activities than in class. Every student should be encouraged to do this. More hands-on activities when actual things are built would help a lot. More formal training in computer applications (matlab, Pro-E) would help.

I feel the lower division advising wasn’t useful because my advisor did not know what classes were a part of my major—both upper and lower. I would also advise smaller groups for senior design—15 is pushing it.

Upper division advisors were always too busy to talk to all of us. Every time I went to see him, he was busy and he seemed to want to finish the conversation as soon as possible.

Akerman is always too hot; why the wasted heat? Undergrads have no computer room, except ME 308. Aerodynamics lab should be removed and the labs should be redistributed among fluid mechanics/aerodynamics and deform/structures/material science. It would be better to have a couple labs in their relating courses rather than lumping it all into 1 class.