

**CALIFORNIA STATE UNIVERSITY LONG BEACH  
COLLEGE OF ENGINEERING**

**Annual Report on Assessment  
June 1, 2007**

Degree Program Name: **BS in Aerospace Engineering**  
Department Name: **Mechanical and Aerospace Engineering**

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**BS in Aerospace Engineering  
Program Outcomes**

The Aerospace Engineering graduates will have:

- 1** The skills in mathematics, physics and chemistry required to solve real world problems.
- 2** A firm understanding of engineering science fundamentals that enables them to analyze real world problems and propose an appropriate solution to these problems.
- 3** An ability to apply their knowledge in aerospace fundamental disciplines to the analysis and design of components. These aerospace fundamental disciplines include aerodynamics; aerospace materials and structures; propulsion; space environment and space systems; communications and avionics systems; orbital and flight mechanics; and stability & control.
- 4** The ability to work in teams and (1) carry out simplified design problems from the conceptual level to the realization of a manufacturing plan, or (2) design complex systems, such as aircraft or spacecraft, from a preliminary design point of view. Projects address economic and business aspects such as commercial viability.
- 5** The ability to design and conduct experiments, as well as to analyze and interpret data.
- 6** The students will have an understanding of professional and ethical responsibility.
- 7** The ability to build on their knowledge and will be trained to be lifelong learners, pursuing and interested in independent study, research and development.
- 8** Good oral, written and graphical communication skills.
- 9** Training in the role of the engineer in society, and have an awareness of environmental concerns in the engineering profession.
- 10** Knowledge of contemporary issues and current projects in aerospace engineering and of technical, design, and business challenges faced by the aerospace industry.

The following is a partial list of the assessment activities conducted during the past year.

**1. Which student learning outcomes were assessed over the past year?**

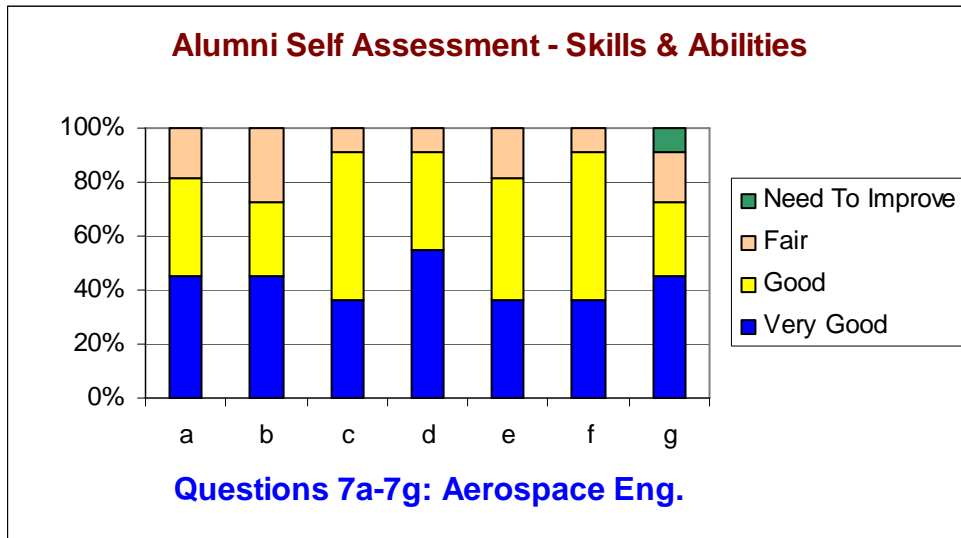
<b>Outcome 8</b> Good oral, written and graphical communication skills.
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**2. How was student learning assessed for each outcome?**

<b>Student Learning Outcome</b>	<b>HOW ASSESSED</b>
<b>Outcome 8</b>	Indirect assessment through a comprehensive alumni survey. The survey was mailed to all Aerospace Engineering alumni who graduated within the last 10 years.

**3. What were the results of the assessment for each learning outcome?**

Student Learning Outcome	RESULTS OF ASSESSMENT
<p><b>Outcome 8</b></p>	<p>One of the important questions in the survey (Question 7) asked the alumni to provide self-assessment of their skills and abilities. The first part of the question, relevant to Outcome 7 is presented here:</p> <p><b>Question 7. Self-assessment of specific skills, abilities and attributes.</b> Please provide us with your opinion of your own skill level and of the value to your professional career.</p> <ul style="list-style-type: none"> <li>a. Communicate orally (including presentations )</li> <li>b. Communicate in writing (including reports)</li> <li>c. Function within multidisciplinary teams</li> <li>d. Function in culturally &amp; ethnically diverse environments</li> <li>e. Identify, formulate and solve problems</li> <li>f. Apply knowledge of math, science and engineering</li> <li>g. Design a system, device, or process to meet desired needs</li> </ul> <p>The results of the survey in response to Question 7 are shown in Figure 1.</p> <p>For the 2006-07 activities, the Aerospace Engineering program decided to focus on improving the areas related to effective communications, in particular written communications as represented by <b>item (b)</b> in the survey question.</p>



**Figure 1: Results of alumni survey for question 7.**

**4. How were the results used for program improvement?**

Student Learning Outcome	PROGRAM IMPROVEMENT
<b>Outcome 7</b>	Steps taken for improvement of outcome 7 are described below.

**Steps taken for improvement of outcome 7: Report reading and reviewing.**

During the 2006-07 improvement cycle, the college implemented an innovative program, where a graduate student from the English department was hired to read and review technical reports written by our students for their projects. The English graduate student focuses on language aspects of the reports, not on technical content. Engineering students receive feedback regarding their writing skills at a very detailed level.

The efforts of the Aerospace Engineering program focused on course MAE 479, which has a very strong writing component. This is a two-part course sequence, offered over two consecutive semesters, and it lends itself easily to long-range plans for improvement of writing skills. The English expert read the student reports and provided useful feedback to students for improvement of their writing ability. In addition the English expert prepared and delivered a set of lectures to the students, addressing the following five areas of concern:

- **Formatting Issues:** Regularizing of title page, proper form for lab reports (etc.), font, tense, proper and consistent use and form for citations and references, avoidance of plagiarism, and so on. It is strongly recommended that the COE adopt a consistent format for scientific/technical paper formats, citations, and references.
- **Development Issues:** How much writing (development) should each section of the work receive, analysis of scope and depth requirements of the projected proposal, paper, etc., pacing and avoidance of rushing, thoroughness, critical thinking and discourse awareness, research skills and source expectations. Some simple good and bad examples of strong and weak topic development could show the students what is required in terms of adequate coverage of a given section or topic.
- **Description Issues:** Providing background information and the “how” and “why” behind the process, avoiding assumptions (related to Development issues above) and verbal shortcuts, audience awareness, providing full demonstrations, anticipating subtleties, nuances, and special conditions, setting the scene, and the “rules of engagement”- i.e.: different purposes of summary, introduction, conclusion, etc. Often in-class writing exercises like “describe how to put on a jacket for someone who’s never seen one,” with associated lecture/discussion, can be useful in showing how to provide complete and clear descriptions (related to Usage issues below).
- **Usage Issues:** Avoidance of ambiguity resulting from bad punctuation, fragmentary phrases and sentences, lack of specifics (using words like “it”), poor use of symbolic logic (lack of understanding of warrants, syllogisms, etc), and inconsistent editing practice. Seeing some good and bad examples of ambiguous technical writing might be helpful for students, also some brief instruction in symbolic logic as it relates to academic writing.
- **Organizational Issues:** Organizational decisions in papers, “the top-down thinking,” linear progression, integration of charts and diagrams. Individual vs. group authorship issues including: voice and vision, style integration, responsibility for readability, and attention to detail. Organizing papers of different types and purposes (for example, differences between summaries, proposals, and abstracts). Peer evaluation skills, discovery and editing and revision skills.

Please send the completed report to your college dean. Please save a copy for your files. If you have any questions or comments, please contact Michelle Saint-Germain at x57094 or msaintg@csulb.edu.