ASSESSMENT PLAN FOR THE BSAE PROGRAM (Spring 2005)

1.   Program Educational Objectives.

The aerospace engineering faculty, in consultation with its constituents, established the following Program Educational Objectives (PEO) for the aerospace engineering program:

a. to provide an undergraduate education to its students that will produce aerospace engineering graduates who are sufficiently knowledgeable of the fundamental principles of engineering to meet the requirements of potential employers in not only the Wichita region, but in the engineering community of the world, and

b. to provide an undergraduate education to its students that will enable capable students to pursue graduate studies in aerospace engineering and related fields.

2.   Program Constituencies.

The faculty members, by consensus, have identified three groups to be the major constituents of the department's degree program. These are:

a. Students, current and former, of our program
b. Organizations that employ the graduates of our program
c. Graduate and professional educational programs where our graduates choose to pursue further studies

3.   Process to Determine and Evaluate Objectives.

The faculty members, by consensus, generated and approved the original statement of the Program Educational Objectives. The Aerospace Engineering Assessment/Improvement Committee (AEAIC) was established as a Department of Aerospace Engineering standing committee consisting of four members. The charge for this committee is to assure that the process of program assessment and improvement is conducted in a timely manner in order to provide for a continuous improvement of the program. In order to satisfy this charge the committee performs the following duties:

a. examines all program assessment materials
b. proposes actions to be taken as a result of their collective evaluation of the assessment materials
c. safeguards and maintains all assessment records and associated materials
d. proposes modifications of the departmental assessment/improvement process.

The Aerospace Engineering Assessment/Improvement Committee periodically reviews the Program Educational Objectives, taking into account input from the program constituents. Input from these constituents is incorporated into the Program Educational Objectives in the manner described below.

a. Student Input:

Exit Interview/Questionnaire

Informal Student Input

Alumni Survey

   b. Employers:

Informal Input

Alumni Survey

Employer Evaluation of the Co-op Students

Industry-University-Government Coalition

Aerospace Engineering Industrial Advisory Board

   c. Graduate Schools:
Common admission standards among graduate programs
Comparing level of performance WSU graduates entering the graduate engineering programs at Wichita State with those who come from other institutions

4.   Program Outcomes.

The program outcomes presented in the list below were adopted by the faculty of the Department of Aerospace Engineering to ensure the achievement of the stated PEO. The faculty arrived at these outcomes in consultation with the other departments within the College of Engineering. These outcomes not only satisfy the minimum required by ABET for accreditation, but also embody the attributes of a good engineer as stated by the Industry-University-Government consortium (KIUGEEC).

   a. Students demonstrate an appropriate understanding of the fundamental courses of the aerospace engineering program.

   b. Students are able to solve complex, open-ended problems using the basic principles and concepts of engineering.

   c. Students demonstrate the ability to solve pertinent problems in their technical fields beyond the material presented in the classroom.

   d. Students demonstrate the ability to prepare satisfactory technical reports and to deliver effective technical oral presentations.

   e. Students are able to work together in teams, take responsibility, and exercise leadership.

   f. Graduates of the program learn of the world's intricacies beyond their own technical fields, have an appreciation of other peoples' values and ways of doing things, and learn about ethical and social values.

   g. Students demonstrate an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

5.   Process for Input/Evaluation/Revision of Program Outcomes.

The indicators below are used to assess the students' achievement of the program outcomes. Table 1 shows the relationship between the program outcomes and each of the assessment activities.

   a. The technical aspect of the curriculum was designed to ensure exposing the students to a broad range of fundamental topics in science and aerospace

engineering. The curriculum is consistent with the requirements specified by ABET.

b. Education in humanities and social sciences is addressed within the guidelines of the university general education policy.

c. Design activities distributed throughout the curriculum are used to expose the students to complex open-ended problems of varying degrees of difficulty. Depending on the course level, some of these problems go beyond the material covered in the course, requiring the students to self educate. Special emphasis is placed on "soft" issues such as ethics and awareness of the world beyond the classroom in capstone design courses.

d. Teamwork, communications, and self-education are specially emphasized in capstone design and laboratory courses, in addition to the technical contents.

e. The Aerospace Engineering Department Assessment Exam (AEDAE) is administered to students during the capstone senior design course. The format of this exam is similar to that of the NCEES FE exam. Results of the AEDAE are compared for trends with those of the national and statewide FE exam. Since no attempt has been made to normalize the results of the AEDAE, the raw scores cannot be used for assessment. However, the results compiled over several years provide trends that allow monitoring the program over time. The results of this exam, when compared with the national and statewide results of the FE exam, provide especially meaningful data about the progress made by the department over time.

f. The department chairman conducts an annual exit interview of the students, as one of the constituents of this program, during their senior year. This interview consists of two segments, a questionnaire that the student fills out at leisure, followed by an oral interview. This survey aims to determine the students' satisfaction with their educational experience while at WSU and serves as a diagnostic tool for the faculty members in delivering the Program Educational Objectives.

g. An alumni survey, with elements common to the College of Engineering and questions that produce aerospace engineering program-specific responses, is mailed to all living graduates of the aerospace engineering program, every two years. In this survey, the alumni are asked a variety of questions, many of which are directly related to the program outcomes.

h. While this is not a cooperative education program by the ABET definition, a considerable number of our students participate in the University's cooperative education program. Companies that employ these students are asked to complete a survey evaluating the student participants in interpersonal skills, communication skills, technology skills, and professional adaptation.

i. Procedures are being developed to track our program graduates during the first six years after graduation in order to monitor their success in developing a professional career or completing a graduate degree program.

Table 1: Relationship between assessment activities and the program outcomes.

Program Outcomes	a. Curriculum	b. General Education	c. Design Throughout the Curriculum	d. Capstone Design and Laboratory Courses	e. Aerospace Engineering Assessment Exam	f. Alumni Survey
i. Understand fundamentals of aerospace engineering	✓		✓	✓	✓	✓
ii. Able to solve complex, open-ended problems	✓		✓	✓		✓
iii. Able to go beyond material covered in classroom	✓		✓	✓		✓
iv. Able to prepare and present technical reports	✓	✓	✓	✓		✓
v. Able to work together in teams	✓		✓	✓		✓
vi. Aware of the world beyond classroom	✓	✓	✓	✓		✓
vii. Proficient with modern engineering tools	✓		✓	✓		✓