Departmental Plan for Assessment of Student Learning  
November 2005

Department: Civil Engineering  
Program: Master of Science  
Prepared: October 2005

1.0 Program Mission Statement:

The mission of the master of science program in civil engineering is to prepare students for careers in private and public practice of civil engineering and for advanced study in the field of civil engineering. The major emphasis of the program is to foster a deeper understanding of the engineering research process. Students in the program usually specialize in environmental engineering, structural engineering, water resources engineering, or pavement materials engineering.

2.0 Student Learning Goals and Related Objectives:

Three learning goals have been established for the program.

Goal #1 – Students will build on knowledge gained in their undergraduate program of study to achieve a fuller understanding of civil engineering and the engineering research process.

Objective 1.1 Students will gain knowledge about civil engineering that will help them to perform research activities in their professional careers.

Objective 1.2 Students will complete a minimum of 30 credit hours of instruction in civil engineering and related fields.

Objective 1.3 Students will participate in a major research experience which will include significant individual involvement and usually culminate in a thesis.

Goal #2 – Students will perform a detailed research project in a specific focus area related to civil engineering.

Objective 2.1 Students will submit a detailed description of their research project for approval by their committee and the graduate school.

Objective 2.2 Students are required to take six credit hours of CIEN 998 to support their research experience. (for the thesis option)
Objective 2.3 Students will prepare a formal written thesis on their research experience. (for the thesis option)

**Goal #3** – Graduates will be prepared for a career in private or public practice in civil engineering and related fields and for further advanced study in the field of civil engineering.

Objective 3.1 Students will gain significant knowledge in the theory and practice of civil engineering beyond that obtained in their undergraduate program of study. In particular, they will gain an appreciation for the collection and/or interpretation of data.

Objective 3.2 Students will develop important career skills by communicating with engineering professionals both orally and in writing, as a part of their research experience.

Objective 3.3 Students will gain detailed knowledge about engineering research by completing a formal written thesis summarizing their research. (for the thesis option)

3.0 **Linkage Between Program Learning Outcomes and Program Activities:**

Achievement of program learning outcomes is linked to program activities through a) the student’s course work, b) their project thesis, and c) their performance on final examinations. All of these activities have documentable results.

4.0 **Departmental Plan for Assessment of Student Learning – Master of Science in Civil Engineering**

Four tools will be used to assess achievement of program goals. These are 1) course surveys completed by students, 2) evaluations of student theses, 3) results of final exams and 4) surveys completed by program graduates approximately 2 years into their careers.

4.1 **Assessment Plan for Goal #1**

(Students will build on knowledge gained in their undergraduate program of study to achieve a fuller understanding of the engineering research process.)

The primary assessment tools for Goal #1 will be results from graduate course surveys and evaluation of final exams.

A set of learning objectives will be developed for each civil engineering graduate course. The learning objectives for each course will be stated on the syllabus. Students will then
be asked to complete a survey at the end of each semester. In the survey, students will be asked to rank the extent to which they believe each learning objective was achieved. A five point scale will be used to rank achievement from 1 (poorly achieved) to 5 (well achieved). The results of the survey will be analyzed by the civil engineering faculty. The metric indicating successful achievement of Goal #1 is that at least 70% of the students in the class who respond to the survey give a ranking of 4 or 5.

The results from the final examinations completed by students in the program will also be examined to assess achievement of Goal #1. The metric for this tool is that 90% of the students pass their final examinations.

4.2 Assessment Plan for Goal #2

(Students will perform a detailed research project in a specific focus area related to civil engineering.)

The primary tool used to assess achievement of Goal #2 is evaluation of student research theses.

Research theses will be reviewed by the student’s advisor, the chair of the department, and one other faculty member. The reviewers will look for evidence of the application of appropriate engineering research principles in the project thesis. Guidelines will be provided to evaluate research content. A brief written statement will be prepared by the reviewers to summarize their findings. The metric for achievement of Goal #2 is that at least two of the reviewers conclude that the thesis demonstrates the student completed a significant engineering research activity.

4.3 Assessment Plan for Goal #3

(Graduates will be prepared for a career in private or public practice in civil engineering and related fields and for further advanced study in the field of civil engineering.)

The primary tool used to assess achievement of Goal #3 is evaluation of results from surveys completed by program graduates.

Surveys will be sent to program graduates approximately two years after they have completed the program. The survey will ask a range of questions intended to evaluate achievement of program goals and to gather information about career related activities. A five point scale will be used to rank achievement from 1 (poorly achieved) to 5 (well achieved). The results of the survey will be analyzed by the civil engineering faculty. The metric indicating successful achievement of Goal #3 is that at least 70% of the students returning surveys respond with a ranking of 4 or 5.
5.0 Determining Achievement of Program Goals

The civil engineering faculty will meet every other year to assess the Master of Science program. The results of the analysis of data from the assessment tools will be examined by all department members who are on the graduate faculty. The graduate faculty members will then vote on whether the various program goals are being achieved.

6.0 Determining How Assessment Results Can Improve the Program

After the graduate faculty members have voted on achievement of program goals, the chair of the department will lead a discussion of how the assessment results can be used to improve the program.

7.0 Reporting Program Assessment Results

After the civil engineering faculty meet to evaluate achievement of program goals, the chair of the department will write a brief report summarizing assessment of program goals and recommendations for program improvement.