Department: Civil Engineering

Program: Master of Engineering

Prepared: October 2005

1.0 Program Mission Statement:

The mission of the master of engineering program in civil engineering is to prepare students for careers in private and public practice of civil engineering and related fields. The major emphasis of the program is to foster a deeper understanding of the engineering design process. The program has four main options. These are environmental engineering, soils-structures engineering, water resources engineering, and general 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 design process.

  Objective 1.1  Students will gain knowledge about civil engineering that will help them to perform design 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 design experience which will include significant individual involvement and culminate in a formal design report.

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

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

  Objective 2.2  Students are required to take six credit hours of CIEN 595 to support their design experience.
Objective 2.3  Students will prepare a formal written report on their design experience.

**Goal #3** – Graduates will be prepared for a career in private or public practice in civil engineering and related fields.

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 major design experience.

Objective 3.3  Students will gain detailed knowledge about engineering design by completing a formal written report on their design project.

### 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 design project, and c) their performance on a compressive exam. Each focus area in the ME Program in Civil Engineering has three required courses. These courses are intended to give the student a solid foundation in engineering design. In addition to the required courses, every student in the program must prepare a design report for their project and take a comprehensive exam before they graduate. All of these activities have documentable results.

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

Four tools will be used to assess achievement of program goals. These are 1) course surveys completed by students, 2) examination and evaluation of student design project reports, 3) results of comprehensive 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 design process.)
The primary assessment tools for Goal #1 will be results from graduate course surveys and comprehensive 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 comprehensive exams 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 the comprehensive exam.

4.2 Assessment Plan for Goal #2

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

The primary tool used to assess achievement of Goal #2 is examination and evaluation of student design project reports. Design project final reports 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 design principles in the project final report. Guidelines will be provided to evaluate design 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 final report demonstrates that the student completed a significant engineering design 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.)

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 in the class respond with a ranking of 4 or 5.

4.0 Determining Achievement of Program Goals

The civil engineering faculty will meet every other year to assess Master of Engineering 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.