Assessment Program Template for College of Engineering Graduate Programs

M.S. Civil Engineering, Transportation Concentration

Program Objectives

1. To prepare students for careers in transportation planning and engineering by equipping them with practical knowledge and skills in transportation analysis and related fields.
2. To prepare research leaders in transportation planning and engineering.
3. To serve the profession both locally and nationally by raising the level of knowledge and skill within the profession and by offering a program accessible to members of the profession doing full-time work.

Program Constituencies

The program's constituencies are its students and the receivers of its graduates – employers in both the private and public sectors and PhD programs.

The program will have two advisory boards. One, consisting of recent alumni, will provide feedback regarding the relevance of the program's curriculum to students' career preparation and PhD program preparation. The other, consisting of employers and industry leaders, including public sector employers, will provide feedback regarding the relevance of the program's curriculum to the needs of industry.

The program faculty, who are involved with PhD education, have various ties to industry, and maintain relationships with recent alumni, will also provide feedback on the relevance of the program's curriculum to the needs of industry, PhD study, and alumni careers.

Program Learning or Student Outcomes

Learning outcomes common to all College of Engineering Graduate programs:

1. An ability to identify, formulate, and solve complex engineering problems.
2. An ability to explain and apply engineering design principles, as appropriate to the program's educational objectives.
3. An ability to produce solutions that meet specified end-user needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

Discipline-specific student outcomes.

4. An ability to explain and use modern software tools used in engineering design and analysis.
5. An ability to analyze, identify and account for the role of uncertainty in engineering analysis and design.

6. An ability to recognize the needs of populations traditionally underserved by the US transportation system such as pedestrians, cyclists, bus riders, and people with disabilities, and to design systems and components that reflect those needs.

Measurement of Student Outcomes and Assessment Plan

Both direct and indirect assessment measures will be used. All of the program's learning outcomes are assessed within courses through exams, projects, and other assignments that are graded and that contribute to student grades. Every 3 years, a curriculum review is conducted in which instructors report the results of these assessments to the faculty, together with a review of the assessment materials (exam questions, other assignments) to ensure that the assessments cover the appropriate learning objectives. Based on this review, curriculum and teaching methods are revised to improve achievement of learning outcomes.

The table below describes the assessments used for each of the program's learning outcomes, along with the specific curriculum review needed to ensure that the assessments address their assigned learning outcomes.

Outcome	Assessment	Direct/Indirect
1	Review of final exam questions and general impressions of student performance vs. faculty expectations to ensure that problems are at an appropriately advanced level.	Indirect
2	Numerical scores on at least two exam questions in CIVE 5376 that deal with design of traffic signal control plans, streets, and intersections.	Direct
3	Numerical scores and grades on the research project in CIVE 5373, with review of specific elements.	Indirect
4	Scores on projects and assignments that use software in all of the program's courses taught by the program's faculty, along with course-by-course review to ensure that the appropriate software is being taught and used.	Direct/Indirect
5	Review of final exam questions and student performance in assignments in IE 6200 to ensure that the role of uncertainty is included, as appropriate, in the assessment.	Direct/Indirect
6	Numerical scores on specific questions in assignments and exams in CIVE 5376 that deal with design for meeting the needs of pedestrians, cyclists, and people with disabilities.	Direct

The measure of attainment for each learning outcome will be the fraction of students whose grades in the relevant assessment are at a level indicating a level of performance that (a) exceeds the outcome, (b) meets the outcome, (c) demonstrates substantial yet only partial achievement of the outcome, and (d) shows no substantial achievement, even partial, of the outcome. Instructors reporting student grades will report them summarized at these four levels.

For example, consider an exam question worth 20 points used to assess a particular outcome. The instructor may determine, based on the grading rubric used, that the minimum scores for achievement levels (a), (b), and (c) are 19, 16, and 14 points, respectively. The instructor would then report the number of students whose score fell in the four performance ranges.

Continuous Improvement Process

The program's faculty will conduct a curriculum review every three years during the department's annual assessment retreat in which its objectives, learning outcomes and curriculum will be refined as needed. Input that will be part of every review cycle include feedback from the program's constituencies, as described earlier, and assessment of student learning outcomes, as described earlier. In addition, the program's faculty may, from time to time, as indicated by feedback from its constituencies, seek additional input from, for example, alumni surveys, employer surveys, a scan of other graduate programs, and so forth.

Between these periodic reviews, the program faculty may propose curriculum improvements consistent with the program objectives and informed by assessment of learning objectives. These proposals will be reviewed by the department's Graduate Director and Department Chair. Proposals requiring governance approval will be entered into the approval workflow appropriate for the level of modification being proposed.

Curriculum

The program will use the assessment and continuous improvement processes to determine if the curriculum is up-to-date with the needs of constituents.

[list program requirements or insert URL for catalog listing]

Faculty

The program must demonstrate that the faculty members are of sufficient number and they have the competencies to cover all of the curricular areas of the program. The program faculty must have appropriate qualifications and must have and demonstrate sufficient authority to ensure the proper guidance of the program and to develop and implement processes for the evaluation, assessment, and continuing improvement of the program.

Full-time faculty:
Peter Furth, Professor

Haris Koutsopoulos, Professor
Daniel Dulaski, Teaching Professor

Part-time faculty who have taught in the program in the past 3 years:

Facilities

Classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the student outcomes and to provide an atmosphere conducive to learning. Modern tools, equipment, computing resources, and laboratories appropriate to the program must be available, accessible, and systematically maintained and upgraded to enable students to attain the student outcomes and to support program needs. Students must be provided appropriate guidance regarding the use of the tools, equipment, computing resources, and laboratories available to the program.

[list any special laboratories or design spaces used on a regular basis for the program]

Special Requirements Specific to the Program

[anything else not covered by previous categories]