PhD in Civil and Environmental Engineering

A candidate for the **PhD** is expected to demonstrate mastery of knowledge in a specific subject area in Civil and Environmental Engineering and to synthesize and create new knowledge, making an original and substantial contribution to their discipline in a timely fashion.

**Proficiencies**

- Make an original and substantial contribution to the discipline
  - Think originally and independently to develop concepts and methodologies
  - Identify new research opportunities within one’s field
- Demonstrate advanced research skills
  - Synthesize existing knowledge, identifying and accessing appropriate resources and other sources of relevant information and critically analyzing and evaluating one’s own findings and those of others
  - Master application of existing research methodologies, techniques, and technical skills
  - Communicate in a style appropriate to the discipline
- Demonstrate commitment to advancing the values of scholarship
  - Keep abreast of current advances within one’s field and related areas
  - Show commitment to personal professional development through engagement in professional societies, publication, and other knowledge transfer modes
  - Show a commitment to creating an environment that supports learning—through teaching, collaborative inquiry, mentoring, or demonstration
- Demonstrate professional skills
  - Advance ethical standards in the discipline
  - Listen, give, and receive feedback effectively

MS in Civil and Environmental Engineering

A candidate for the **MS** also is expected to demonstrate mastery of knowledge in specific subject area in Civil and Environmental Engineering and to synthesize and create new knowledge, making a contribution to their discipline in a timely fashion.

**Proficiencies**

- Make a contribution to the scholarship of the field
- Learn advanced research skills
  - Synthesize existing knowledge, identifying and accessing appropriate resources and other sources of relevant information and critically analyzing and evaluating one’s own findings and those of others
  - Apply existing research methodologies, techniques, and technical skills
  - Communicate in a style appropriate to the discipline
- Demonstrate commitment to advancing the values of scholarship
  - Keep abreast of current advances within one’s field and related areas
• Show commitment to personal professional development through engagement in professional societies and other knowledge transfer modes
• Show a commitment to creating an environment that supports learning—through teaching, collaborative inquiry, mentoring, or demonstration

• Demonstrate professional skills
  o Adhere to ethical standards in the discipline
  o Listen, give, and receive feedback effectively

Aspirational Goals

Cornell University and the Graduate Field of Civil and Environmental Engineering have expectations of Cornell graduates that defy explicit measurement scales. These aspirational goals are intended to encourage growth and development but do not necessarily lend themselves to assessment as readily as the learning proficiencies.

• Be a researcher and scholar in their field of expertise
• Effectively engage in one’s broader community through various forms of outreach
• Explore interconnections
  o Focus on plural contexts and cultures
  o Respect research in other areas
  o Understand and articulate the impact of research on society

An MS or PhD student is expected to demonstrate knowledge in a particular Civil and Environmental Engineering subject area and to synthesize and create new knowledge, making an original contribution in a timely fashion. This goal can be accomplished by making an original contribution to the discipline and by learning advanced research skills. Further, goal attainment can be accomplished by synthesizing existing knowledge, indentifying and accessing appropriate resources and other sources of relevant information and critically analyzing and evaluating one’s finding and those of others. Application of existing research methodologies, techniques, and technical skills must also be accomplished and communicated in a style appropriate to engineering. It is important to initiate or maintain engagement with the discipline by keeping abreast of current advances within one’s field and related areas. Commitment to professional development through membership and participation in professional societies is important. The attached rubric chart can be used to evaluate the student’s performance relative to these goals.

For the PhD the major sources of evaluation metrics are the Q exam, seminar presentations, the A Exam and the B exam. The Q exam is typically an oral exam administered by faculty in the student’s subject area. The exam tests the candidate’s academic preparedness and their ability to use this preparation to solve engineering problems. The A exam is administered by the student’s Special Committee. It is generally taken after the student has achieved their first research results and is able to propose a research program that will lead to the thesis research topic required for the PhD degree. The B exam is a defense of thesis exam where
completion of the thesis research and a resulting thesis draft are presented in an oral exam given by the student’s Special Committee. The MS degree requires only one exam; the thesis defense. This exam is an evaluation of the thesis research via oral presentation of the thesis to the student’s Special Committee. Additional evaluations of both the PhD and MS students will include seminar, TA course evaluations, awards and course grades.

An evaluation of the metric overall score will be done after each evaluation event to mark the progress of the student during their degree program. Finally, upon graduation, each graduate will be interviewed for opinions on the quality of the program and for suggestions for improvements.