

**Department of Civil and Environmental
Engineering**

Lehigh University

Summary of Rules and Regulations

**PhD Program
for the
Structural Engineering Degree**

August 2006

Summary of Rules and Regulations for PhD Program in Structural Systems Engineering

Students should consult the Lehigh Catalog and the College Graduate Student Handbook, for more detailed information.

I. Overview of Requirements

1. Fundamental Engineering Science

Students with a non-CEE background must demonstrate a minimal proficiency in at least three of the following five areas. This requirement is satisfied by the completion of courses equivalent to the Lehigh courses indicated below, with grades of B or better.

1)	Solid Mechanics	Mech 12
2)	Soil Mechanics	CEE 142
3)	Structural Analysis I	CEE 159
4)	Structural Analysis II	CE 259
5)	Steel Design	CEE 262
6)	Concrete Design	CEE 264

2. Credit Requirements:

- a) There is no specified minimum requirement for courses. However, most Ph.D. programs include 20 to 30 credits of course work beyond the master's degree.
- b) The total number of (tuition) credits, including dissertation research, should be at least 72 beyond the bachelor's degree. If the master's degree is from another University, a minimum of 48 (tuition) credits is required at Lehigh.

3. Residence Requirement:

Either two semesters of full time graduate study or 24 credits of graduate study within a 12-month period.

4. Time Limitation:

- a) A resident student is expected to complete the doctoral degree in three to four years after earning the master's degree.
- b) Maximum time limit is ten years for all work past bachelor's degree, or seven years for doctoral program if there is a break of at least one semester after the completion of master's degree.

5. Registration Requirements:

- a) A full-time Ph.D. student is expected to register for at least nine credits each semester until the minimum requirement (item 2b above) is reached.
- b) If the minimum credit requirement is attained before formal admission to candidacy, continued registration of at least 3-credits each semester is required.
- c) After admission to candidacy, a student must register continuously every semester.
- d) After admission to candidacy and fulfillment of the minimum (tuition) credit requirement, a student registers for "Maintenance of Candidacy" (CE 499-10, 1 credit).
- e) A student must be registered in the semester of his/her graduation. A spring or summer registration will suffice for the following January graduation, provided all work is completed before the fifth day of fall classes.

6. **Performance Requirement:**
 - a) Courses with grades below C are not allowed in graduate degree programs.
 - b) More than four grades below B in entire Lehigh graduate career (regardless of number of credits) will terminate student's eligibility for continued graduate work at Lehigh.
7. **Time Sequence**
Section II explains the Milestones for completing the PhD requirements including the Qualifying Exam, General Exam, and Final Examination (Dissertation Defense). The student's Background Information Form (Attachment C) should be updated and submitted to the department associate chairman before each exam.

II. MILESTONES: TIME SEQUENCE AND PROCEDURE

The box below summarizes the time requirements that are subsequently provided in more detail as adopted by the CEE faculty on 3-17-99.

1. **Qualifying Exam:** Take at end of the first semester[#]
2. **Dissertation Supervisor:** Identified prior to the end of the second semester
3. **Committee:** Form prior to the end of the third semester
4. **PhD Proposal & Admission to Candidacy:** Submit prior to the end of the third semester^{*}
5. **General Exam:** Take prior to the end of the fifth semester^{**}
6. **Dissertation Draft:** Submit 2 weeks before Dissertation Defense; see university requirements
7. **Dissertation Defense and Final Examination:** See university requirements
8. **Submission of Completed Dissertation and Application for Degree:** See University requirements

[#] Or at the end of the semester after completion of Lehigh CEE MS degree. Must petition to try a second time

^{*} Not less than 12 months before graduation; includes Course Program & Dissertation Topic

^{**} At least 7 months before graduation

1. **Qualifying Examination (See Attachment A)**
 - a) Lehigh Master's students continuing for PhD are required to take it at the end of the semester after completion of the master's degree.
 - b) All others must take it at the end of the first semester of graduate study.
 - c) If unsuccessful, a second examination one semester later may be granted upon petition. A third attempt is not allowed.

2. **Dissertation Supervisor** to be identified at end of second semester.
3. **Ph.D. Committee** to be organized by the end of the third semester.
 - a) The student, in consultation with the academic advisor and other faculty members, identifies a general topic for dissertation and a dissertation supervisor.
 - b) The dissertation supervisor and the academic advisor, in consultation with the student, prepare a list of proposed additional members of the committee:
 - The committee consists of at least four members (usually five)
 - At least one member should be from outside the CEE Department.
 - The dissertation supervisor is one member of the Committee.
 - One CEE member of the committee, other than the dissertation supervisor, is designated the chairman.
 - The Committee chairman will become the new academic advisor
 - The previous academic advisor may join the committee, dependent upon the subject of study.
 - c) The proposed committee chair (new academic advisor) sends a memo with the proposed committee roster to the department chairman. The Ph.D. committee is formed when the department chairman issues a memo approving the committee and appointing the faculty members.
4. **Admission to Candidacy**
 - a) No later than the end of third semester after starting PhD program.
 - b) A Written proposal must be submitted, including course program and a discussion of proposed dissertation research (subject and outline).
 - c) The Proposal is to be approved by the University Graduate and Research Committee via the Ph.D. Committee, the department chairman, and the associate dean of graduate studies, not less than twelve months before graduation.
 - d) A "Proposed Program of Study" is to accompany the "Application for Admission to Candidacy for the Doctorate". As adopted by the CEE faculty on 10-16-87, it should include the following parts:
 - A signature sheet listing all members of the Ph.D. committee and department chairman.
 - Previous work experience, if any
 - Previous education – Bachelor's and Master's degrees
 - Graduate courses taken and planned, grouped as follows:
 - Master's degree courses – List course numbers, title, credit hours and grade. Indicate Lehigh equivalent for courses taken elsewhere. Where applicable, identify the instructor of each course. For future courses, indicate when the course is to be taken.
 - Doctoral degree courses – same as for Master's.
 - Qualifying and General Examinations
 - List the date when the qualifying examination was passed

- List the planned time of the general exam
- English language proficiency: Foreign students must include a statement, to be signed by the department chairman, certifying the candidate's English language proficiency.
- Dissertation subject and outline. Limit to five page, preferably no more than two.
- Projected date of graduation.

The full document should be approved by the committee, signed by each member of the committee and the department chairman. It is then submitted to the Graduate School in the Engineering College for approval.

5. General Examination (Attachment B)

- a) Taken prior to end of fifth semester.
- b) Must be passed at least seven months before graduation.
- b) If unsuccessful, a second attempt may be granted, scheduled at least 5 months after the first one.

6. Dissertation Draft

- a) Approval of draft by the dissertation supervisor and another member of committee
- b) Inspection by the associate dean of graduate studies, at least six weeks before graduation.
- c) Distribution of approved draft copies before final examination at least two weeks before final examination.
 - one copy to each member of the committee
 - one copy to CEE department chairman, if requested
 - one copy to CEE departmental library for public perusal

7. Dissertation Defense and Final Examination

- a) Dissertation defense and final examination - open to public, with a closed portion

8. Submission of Completed Dissertation and Application for Degree

- a) Submission of final dissertation copies

Dissertation in its final form should contain a signature sheet bearing signatures of each member of the PhD committee as well as that of the CEE department chairman.

Two unbound copies of the dissertation in its final form are required at the associate dean's office at least two weeks before graduation.

Bound final copies of the dissertation should be distributed as follows:

- one copy to each member of the committee
- one copy to CEE department chairman, if requested
- one copy to CEE departmental library

- b) Application deadline:

- To graduate on University Day - March 1
- To graduate in January - November 1

REGULATIONS REGARDING THE PHD QUALIFYING EXAMINATION

Prior to submission to the Graduate School of an *Application for Admission to Candidacy for the Doctorate*, each prospective doctoral candidate must pass a Ph.D. qualifying examination administered by the Department of Civil and Environmental Engineering.

A. OBJECTIVE OF EXAMINATION: The objective of the Ph.D. Qualifying Examination is to establish whether or not a candidate has sufficient intellectual ability, strong motivation, and an adequate understanding of the fundamentals of Civil Engineering to have a reasonable chance of successfully completing the requirements of the Ph.D. program.

B. TIME OF EXAMINATION: The examination will be held twice a year, at the end of each semester. The candidate must take the examination at the first offering upon attainment of the Master's degree or, if the Master's degree is from another university, at the end of his/her first semester in residence at Lehigh.

C. THE QUALIFYING EXAMINATION COMMITTEE: The examination will be administered by the Qualifying Examination Committee in the candidate's major field of study. At the present time, the available major fields are Environmental Engineering, Geotechnical Engineering, Hydraulic Engineering and Structural Systems Engineering.

D. WRITTEN EXAMINATION: Each candidate must exhibit an advanced understanding (equivalent to a master's degree) of his/her intended major field of study. The written examination will be four to eight hours in duration. Additional details are determined by each qualifying examination committee as follows:

1. Structural Engineering

The written examination will be given in two three-hour parts on consecutive days. Both parts will be closed book. The first part will consist of six to eight short questions all of which must be answered. The second part will have four to five in-depth questions, three to four of which are to be answered.

2. Hydraulic Engineering

There will be one five hour written exam. It will consist of a two-hour portion in the morning and a three-hour portion in the afternoon. The exam will be closed book, but appropriate and possibly extensive supporting material will be provided by the faculty member submitting each problem. The morning portion of the exam will consist of six short undergraduate level questions on basic fluid mechanics and hydraulics (e.g. CEE 121, CE 222, CEE 328). The student must answer all of the questions. The afternoon portion of the exam will consist of four or five problems of more in-depth and advanced nature (e.g. ME 331 and CEE 400-level courses). The examinee may be allowed some choice of problems on this portion of the exam.

3. Geotechnical Engineering

There will be two written examinations given on consecutive days. The first one will be a 3-hour closed-book examination consisting of 6 questions all of which to be answered. These questions will be of fundamental nature pertaining to soil mechanics and geotechnical design. The second one will be a 4-hour open-book examination consisting of 3 in-depth questions all of which to be answered. There will not be a restriction regarding to the nature of books/notes allowed inside the examination room.

4. Environmental Engineering

There will be two 3-hour written examinations on two different days. First 3-hour examination will be closed book and involve fundamentals pertaining to environmental science and engineering. No choice in selection of questions will be allowed in this part. Second 3-hour examination will involve more in-depth (probably longer) problems and some choice in selection of questions will be permitted. This will be an open-book examination with partial restriction in regard to the number and nature of books/notes to be allowed inside the examination room. Environmental engineering faculty will decide later about the exact nature of partial restriction about the books/notes and the courses/subject areas to be covered in the second 3-hour examination.

E. ORAL EXAMINATION: Each candidate will be orally examined by the respective qualifying examination committee. The oral examination is open to all departmental faculty members. Questions are not necessarily restricted to the major area. The duration of the oral examination will not be more than 1½ hours.

F. EXAMINATION PROCEDURE:

1. The written examination will be given first. The oral examination will be scheduled as soon as possible after completion of the written examination, normally within a week.
2. Prospective candidates must take both the written examination and the oral examination at the same offering the Ph.D. Qualifying Examination.
3. The performance of each candidate will be judged by the Qualifying Examination Committee in the candidate's major area. The decision to pass or fail will be based on the results of the Qualifying Examination as well as on the candidate's total engineering experience up to the Qualifying Examination.
4. The result of the Qualifying Examination will be one of the following:
 - a) **PASS**
 - b) **PASS CONDITIONALLY** with specific requirement(s). These condition(s) must be removed before the applicant is considered to have passed the Qualifying Examination.
 - c) **FAIL**
5. Each candidate will be informed of faculty's decision in writing by the Chairman of the Department.
6. A candidate who fails the qualifying examination may petition for a second examination, but it must be taken at the next scheduled offering. The result of the second examination will be either PASS or FAIL (no PASS CONDITIONALLY).
7. A third examination is not permitted. Those who do not pass the qualifying examination second time are no longer considered to be pursuing a PhD degree and are encouraged to arrange to earn a terminal MS degree.

PhD GENERAL EXAMINATION

A. OBJECTIVE: In conformity with the University regulations stated in the Catalog, the Ph.D. General Examination serves to establish whether or not a particular candidate possesses adequate *capacity* and *proficiency* in his field of study to be acceptable to the Department. In particular, the examination provides an opportunity for those faculty members not well acquainted with the candidate to satisfy themselves of his competence, and allows the faculty to establish a concrete quantitative and comparative estimate of the candidate's ability.

Specific qualities to be tested are as follows:

- 1) Familiarity with up-to-date factual knowledge in the candidate's field.
- 2) Analytical ability to work within the scope of available information and to advance into new areas.
- 3) Familiarity with reference material and ability to use it.
- 4) Ability to defend ideas in front of a group.

B. TIME: The general examination should be taken upon an essential completion of all coursework in the candidate's program and before the candidate gets deeply into his dissertation. It should preferably be taken at least one year before the candidate's prospective date of graduation, and it must be passed at least seven months before the degree may be awarded. The specific time is arranged by the Special Committee and the candidate.

C. THE EXAMINATION: The general examination shall consist of a written part and an oral part.

1. **Open Book Written Examination:** The written examination will normally be five calendar days long. It will consist of between five and ten problems designed to test qualities (1), (2), and (3). Problems may or may not have specific solutions. The problems may require extension of a candidate's knowledge. At least one problem should test the candidate's ability to do independent research.
2. **Oral Examination:** The oral examination will be given within one to three weeks after the written examination, and it will stress quality (4). The questioning period will be normally of not more than one and one-half hours' duration. The examiners will consist of the faculty of the Department of Civil Engineering and the candidate's Special Committee. The faculty may, on occasion, invite the participation of faculty members from outside of the Department.

D. EVALUATION: Immediately following the oral examination, the candidate's Special Committee, with the advisement of all other faculty members, will evaluate the candidate's performance in the general examination. Normally, the outcome of the examination will be "Pass" or "Fail". However, in the exceptional case when a clear-cut decision cannot be agreed upon, the Special Committee has the right to "Continue" the examination. Then, the candidate will be required to take an additional examination (both written and oral). This "Continuation" part of the general examination will be conducted in about three months and may be of a smaller scope than the original examination.

E. NOTIFICATION: The chairman of the Special Committee will inform the candidate of the decision as soon as feasible. Should the candidate fail, he is permitted to make a second attempt not sooner than five months after the first examination.

Background Information

Name:

Date:

Major Area:

1. Non-Academic Professional Experience (Industrial, consulting, contracting, military)

2. Academic Background (B.S., and Graduate Work before Lehigh){Years, University, Degrees}

3. Graduate work at Lehigh (group courses after M.S. separately){Courses, Instructor's Name, Grades, e.g. CE 413 (Wilson).

4. PhD Objectives

5. Evaluation by Academic Advisor or Tentative Dissertation Supervisor

6. Qualifying Examination Date:
Written: Oral:
Decision:

7. Tentative Committee:
 - 1) _____ (Chairman)
 - 2) _____ (Supervisor)