

## **New Format for CEEM PhD/EngScD Qualifying Exam**

CEEM Graduate Committee

September 20<sup>th</sup> 2012

---

1. The Qualifying Exam will consist of two parts:

- a. A Screening Exam, and
- b. A Candidacy Exam

Students need to pass both sections of the exam and maintain GPA of 3.25 or higher before they are recognized as candidates for the PhD/EngScD Degree.

2. The timing of the two components of the Exam will be as follows:

a. Screening Exam: A student must take the screening exam the first January after they are registered in CEEM as a graduate student holding an MS degree. Students entering CEEM with an MS degree will therefore take the exam the first January of their tenure in the department. Students entering CEEM with a BSc degree will first obtain the MS degree and then take the exam the January after their MS has been conferred. Students entering CEEM with an MS degree in January can take the exam the following January.

b. Candidacy Exam: Students are required to take this exam before the end of their third year as a graduate student in the Department, regardless of whether they entered the CEEM graduate program with a BSc or MS degree. The exam cannot be taken during the same semester as the PhD defense itself.

3. The Screening Exam will be 5 hours long and will take the format described below. It is expected that the exam will consist of a morning session of 3 hours, followed by a break and then an afternoon session of 2 hours.

i) A student must answer four questions in three hours on the following four topics: Statics, Dynamics, Mechanics of Solids and Fluid Mechanics. The questions will be set at the level of challenging problems based on the CEEM undergraduate curriculum. Only four questions will be set and each student must attempt to answer all four of these questions. Each question will be graded out of 100, giving a maximum possible 400 points. To pass this section a student must obtain 250 points minimum.

ii) A student must also answer two questions in math within two hours. These two questions will be chosen from a selection of four questions set at the graduate level (4000-level). Areas that can be examined include probability, numerical methods, linear algebra, ODEs, PDEs. Each question will be graded out of 100, giving a maximum possible 200 points. To pass this section a student must obtain 125 points minimum.

The CEEM graduate committee might choose to administer an additional oral exam on the topics of the screening exam questions for students who are considered borderline Pass/Fail.

4. The format of the Candidacy Exam is as follows:

a. The Candidacy Exam Committee will consist of at least three CEEM faculty members. The Student's research advisor can opt for a larger committee size (no larger than 5 members) with faculty members outside the Department if he/she believes this to be beneficial.

b. The Exam will consist of a written and oral component. At least 10 days prior to the scheduled oral component of the exam, the student must submit a written proposal for his/her PhD/EngScD topic of about 5 to 10 pages in length. The format of the proposal will be decided in consultation with the Student's research advisor, but might include a literature review, the hypotheses to be tested by the research, the proposed research methods, any results acquired to date and a proposed schedule for completing the PhD/EngScD. During the oral component of the exam, which is expected to be about 1 to 2 hours in duration, the Student will present the PhD/EngScD proposal and answer questions on both the proposal and his/her chosen research area. The presentation of the Student's proposed PhD/EngScD research should be in enough depth to enable a committee to determine the viability of the proposed topic and the candidate's ability to conduct the research.

c. The Candidacy Exam Committee will decide the results of the Exam, which can be: (i) Pass; (ii) Re-examination required, or (iii) Fail. In the case of option (ii) the Student's advisor will provide the Student with feedback on what areas the student needs to strengthen his/her work before a re-examination can be scheduled.

5. Additional minimum qualifications for a PhD.

Individual advisers may impose additional requirements for completion of the PhD/EngScD, such as publication of research, conference presentations, etc.