

Computational and Applied Mathematics Requirements for Advancement to Ph.D. Candidacy

Each student must develop a program of study in Computational and Applied Mathematics (CAM) that includes a substantial component from each of the three CAM Concentration Areas. These areas are Applicable Mathematics (Area A), Numerical Analysis and Scientific Computation (Area B), and Mathematical Modeling and Applications (Area C). The student must demonstrate breadth and proficiency in each of the three Concentration Areas. Research for CAM theses and dissertations must demonstrate an interdisciplinary theme and draw on knowledge from the CAM disciplines and each of the three Concentration Areas.

Summary, Deadlines, and Expectation of Progress

Normally the student should complete the CAM program within five years of graduate study. This is our and the University's expectation of the progress a student should make but *not* a firm requirement; individual cases may vary. Students who begin the program with a Master's degree in a related subject are expected to complete the process one year earlier; for such students, subtract one year from the expected progress times below, except as noted.

1. Complete course requirements in Areas A, B, and C, normally within the first two years. (Students with a related Master's degree will still normally require two years to satisfy course requirements.) Obtain confirmation of completion from the Graduate Advisor.
2. Complete qualifying exams in Areas A, B, and C. Normally the Area A and B exams should be attempted by the end of the second year, and the Area C exam should be attempted by the middle of the third year, and earlier if possible. Normally all three qualifying exams should be passed by the end of the third year of study. The format of the Area C exam requires prior GSSC approval.
3. Select a CAM dissertation advisor and a dissertation committee, which must be approved by the Graduate Advisor.
4. Submit an abstract concerning how Areas A, B, and C are reflected in the proposed dissertation research. Obtain GSSC approval before proceeding with the proposal.
5. Submit a dissertation proposal, normally by the middle of the fourth year.
6. Take an oral candidacy examination at least two weeks past submission of the proposal.
7. Submit a Graduate School application for candidacy.

Specific Requirements

1. The student must obtain written confirmation from the Graduate Advisor that course requirements for Areas A, B, and C are satisfied. These requirements are as follows.
 - (a) The student's overall grade point average must be 3.0 (B) or better. Courses taken PASS/FAIL cannot be used to satisfy CAM course requirements.
 - (b) In each of Areas A, B, and C, the student must have received credit for at least four courses and achieved a grade point average of 3.0 (B) or better in those courses. Moreover, in one of Areas A, B, or C, the student must have achieved a grade point average of 3.5 (B+/A-) or better.

- (c) Undergraduate courses are acceptable when they introduce students to areas distant from their original undergraduate degree. No more than two undergraduate courses in any given Concentration Area will be accepted.
 - (d) All requirements of the Graduate School must be fulfilled.
2. The student must demonstrate a graduate level proficiency in Areas A, B, and C by passing three qualifying exams, one in each Area. It is expected that these exams will have been passed by the end of the third year of study.
 - (a) The Area A and Area B examinations are administered by the CAM Graduate Studies Subcommittee (GSSC).
 - (b) The Area C exam must be on a topic pertinent to the student's planned application area of research. Administration of the exam and its format will be determined through consultation between the student, the Graduate Advisor, and the student's proposed thesis advisor. Often a Ph.D. qualifying exam in one of the CAM disciplines is acceptable. The plan for administering the examination must be presented by the Graduate Advisor to the GSSC for approval before the student attempts the exam.
 - (c) A student may fail up to two examinations, but not more than one in any single CAM Concentration Area. Any student failing a greater number of exams may not continue in the program unless permission is granted by the GSSC.
 3. The student must select an advisor from the CAM faculty willing to supervise his or her dissertation. The student and thesis advisor must recommend to the Graduate Advisor a dissertation committee to pose the candidacy exam and supervise the dissertation.
 - (a) The dissertation committee must consist of the advisor and at least four additional faculty members. The committee must include at least one CAM faculty member representing Area A, a second representing Area B, and a third representing Area C, not including the student's advisor.
 - (b) The Graduate Advisor must approve the composition of the committee.
 - (c) The GSSC may review and require changes in the composition of any dissertation committee.
 4. The student must prepare a concise, written abstract of the dissertation proposal describing how each of the three CAM Concentration Areas A, B, and C will be addressed in and form an integral part of the proposed research. Before the candidacy examination may be scheduled, this abstract must be submitted to the Graduate Advisor and approved by the GSSC, either by a no-protest vote or at its next regularly scheduled meeting. It is *strongly* recommended that this abstract be prepared and submitted well before the full dissertation proposal is completed.
 5. The student must prepare a written dissertation proposal. The written proposal must be presented to each member of the dissertation committee and submitted to the Graduate Advisor, who will make it publicly available. The goals of the proposal are to:
 - (a) Deliver a statement of research problems, including motivation for their solution;
 - (b) Demonstrate familiarity with the technical background of the problem, including a bibliography;
 - (c) Sketch at least one potentially successful method to attack an unsolved research problem;

- (d) Describe preliminary work on a problem indicating research competence;
 - (e) Describe the stages of future research.
6. The student must take an oral candidacy examination. It must be scheduled a *minimum* of two weeks past submission of the dissertation proposal. The examination is to be announced publicly to CAM faculty and students and within the Texas Institute for Computational and Applied Mathematics (TICAM).
 - (a) The first portion of the oral candidacy exam is a presentation by the student about 45 minutes in length that is open to the general public. The second portion of the exam, about an hour in length, is restricted to CAM faculty members, and consists of questions relevant to the proposal. Questions about supporting materials are also appropriate.
 - (b) A student has passed the oral candidacy exam if the dissertation committee agrees with at most one dissenting vote that the student has demonstrated a thorough knowledge of the research area; developed a sufficiently rich, original and interdisciplinary research program; and demonstrated competence to complete the proposed research.
 - (c) In the event that a student fails the examination, it should be taken again within six months. The dissertation committee is charged with explaining to the student the reasons that his or her performance was not satisfactory and the improvements that are needed. If changes in the committee are desired, they must be approved by the Graduate Advisor. A student who has failed two candidacy exams will not be allowed to continue in the program unless permission is granted by the GSSC.
 7. Following passage of the dissertation proposal examination, a student must prepare and submit a Graduate School application for candidacy.
 8. Written requests for waivers from any of the above requirements may be submitted to the CAM Graduate Studies Subcommittee (GSSC) through the Graduate Advisor.

Effective February 18, 1998