

Handbook of the CCDM PhD Program for Students with Mathematics Home Department

0. Overview:

The CCDM program is an Area of Emphasis within the Mathematics Ph.D. program. Students are expected to meet the normal pre-requisites for admission to the Ph.D. program¹, and to satisfy certain pre-requisites for the CCDM program as well. Students in the CCDM program are required to take 35 credit hours of coursework beyond the M.S. degree (as compared with 26 hours in the regular Mathematics Ph.D. program). Entrance exam requirements, and course work distribution requirements, are slightly different for mathematics Ph.D. students in the CCDM program. For the entrance exam, the CCDM breadth exam replaces one of the mathematics area exams (Algebra, Analysis, Topology, Differential Equations). Course work requirements in the major/minor areas (a total of 24 hours) depend on the home department(s) of the student's thesis adviser (chair or co-chair of the the student's PhD committee), as outlined below.

1. Admission:

Only students who have gained admission status in the Mathematics PhD program will be considered for admission to the CCDM program. Prerequisite courses must include:

CS 320 or 601 or 602(Algorithms/Data Structures and Software Engineering),
Math 341 or 343 or 441(Linear/Abstract Algebra),
Stat 461(Probability)

2. Course and Dissertation Requirements:

(2.1) A total of at least 35 hours of approved graduate coursework credit in Mathematics, Statistics, and Computer Science (or approved electives) must be completed beyond an MS degree. Courses which do not count towards graduate degrees in one of these areas will not count towards these hours.

(2.2) A student in the CCDM program must take all of these courses:

CS 520(Advanced Analysis of Algorithms), Math 571(Combinatorics),
Math 573(Graph Theory), Stat 561(Probability)

(2.3) At least 26 hours must be taken in doctoral-level courses. Among these 26 hours, 2 credit hours must be in Math 796 (Graduate Seminar), at least 12 credit hours in a major area and at least 6 hours at each of the two minor areas.

The major and minor areas must be chosen from at least three of the groups listed below.

A. Analysis, Differential Equations, Numerical Analysis, Topology.

B. Algebra, Combinatorics, Combinatorial Optimization and Matroid Theory,
Graph Theory, Number Theory, Set Theory.

C. CS courses

CS 525(Algorithm)

CS 522(Complexity)

CS 540(Database Systems)

D. STAT courses

Stat 562(Probability and Statistics)

Stat 645(Linear Models)

Stat 521(Data Mining)

¹for example, an MS in Computer Science or Statistics with sufficient background in real analysis (equivalent to Math 451/452)

CS 727(Information Dissemination)	Stat 525(Statistical Computing/Modeling)
CS 722(Adv. Theory of Computing)	Stat 565(Markov Processes)
CS 725(Recursion Theory)	Stat 667(Bioinformatics)
	Stat 665(Probabilistic Networks)

(2.4) For CCDM students with mathematics chairs, the major area and one of the minor area must be taken within the Department of Mathematics. For CCDM students with mathematics and computer science/statistics co-chairs, either the major area or both of the minor areas must be taken within the department of mathematics.

Upon the approval of the graduate program committee, at most one course (3 hours) may be taken at the 600 level in each of the two areas A and B listed above.

(2.5) A student must complete a PhD dissertation worth of at least 24 hours of doctoral research credits.

3. Advisory Committees

(3.1) Before the forming of the PhD Committee of a student, an Advisory Committee will be appointed by the Graduate Director to the student, following the same guideline defined in the Graduate Handbook of the Mathematics Department.

(3.2) The student must file a request with the Graduate Director to appoint a dissertation committee (the PhD Committee).

(3.3) The PhD Committee shall consist of five members with the dissertation adviser as chair (or co-chair). If the dissertation adviser's home department is not from mathematics, then a co-chair from mathematics will be appointed. At least one member of the committee must represent a department other than the student's home department and at least one member should be a faculty member from outside the CCDM. At least three committee members should be recognized CCDM faculty. The dissertation adviser and at least one other member will represent the major area. This committee will be appointed by the Graduate Director after consultation with the student, the proposed dissertation adviser, the department chairpersons, and the other faculty members involved.

4. Examinations

(4.1) A student must pass the CCDM Entrance Exam consisting of the CCDM breadth exam (algorithms, combinatorics, probability, and graph theory) and one written exam from the following:

Algebra, Real Analysis, Differential Equations, and Topology.

Upon passing the (Regular or CCDM) PhD Entrance Exam, a student becomes a regular PhD student.

(4.2) Retaking the CCDM Entrance Exam:

Each student can take up to two times of the CCDM Entrance Exam.

If a student fails the CCDM Entrance Exam in the first try, the student must take the whole CCDM Entrance Exam again in the next available schedule.

Subject to the approval of the Graduate Program Committee, on the recommendation of the advisory committee of the student, a student in the CCDM program who fails the CCDM Entrance Exam in the first try can switch to the regular PhD program, in which case the student can take the regular PhD Entrance Exam up to two times, and must pass the regular PhD Entrance Exam within 2 semesters after the switching is approved.

Subject to the approval of the Graduate Program Committee, on the recommendation of the advisory committee of the student, a student who fails the PhD Entrance Exam in the first try can switch to the

CCDM program, in which case the student can take the CCDM Entrance Exam up to two times, and must pass the CCDM Entrance Exam within 2 semesters after the switching is approved.

The funding of a Graduate teaching Assistant in the Department of Mathematics is subject to termination if the student fails to pass the (Regular or CCDM) PhD entrance exam two times. (See also the Section 5: Switching Programs.)

(4.3) A CCDM PhD applicant must pass the Qualifying Exam within two year after the passing of the Entrance Exam. The Qualifying Exam consists of three parts:

PART 1: One three-hour written examination over the major area, followed by an oral exam.

PART 2: Presentation of a dissertation prospectus.

PART 3: This part is needed only when the student fails to meet the GPA requirement (3.5 or better) on one or both of the minor areas. One three-hour written examination over each minor area in which the student fails to meet the GPA requirement must be taken.

(4.4) The grading and appeal procedures of these exams will follow the same procedures as defined in the Graduate HandBook of the Mathematics Department.

5. Switching Programs

(5.1) Upon the approval of the Advisory Committee of the student, a regular PhD student in the CCDM program can switch to the regular PhD program, with the condition that the student must take a PhD Entrance Exam in an additional subject not taken by the student in the CCDM Entrance Exam, and must pass this exam within 2 semesters after the switching is approved. The student can take this exam up to two times.

(5.2) If a student fails the regular PhD Entrance Exam two times, then the student's PhD program will be terminated.

(5.3) Upon the approval of the Advisory Committee of the student, a regular PhD student in the regular PhD program can switch to the CCDM program, with the condition that the student must take the CCDM Breadth Exam, and must pass this exam within 2 semesters after the switching is approved. The student can take this exam up to two times.

(5.4) If a student fails the CCDM Entrance Exam two times, then the student's PhD program will be terminated.

6. Other Requirements and Possible Conflict Between Programs

(6.1) A student in the CCDM program must also fulfill other requirements which are not stated or revised above and which are stated as PhD requirements in the Graduate HandBook of the Mathematics Department.

(6.2) Except for the revisions stated in Section 2: Course and Dissertation Requirements and Section 4: Examinations, the Graduate Handbook of the Mathematics Department will take precedence should there be a conflict between the CCDM document and the Graduate Handbook of the Mathematics Department.