Courant Institute of Mathematical Sciences

New York University

DEPARTMENT OF COMPUTER SCIENCE PHD STUDENT HANDBOOK

Courant Institute of Mathematical Sciences

Warren Weaver Hall

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Requirements for PhD in Computer Science

To receive a PhD in Computer Science at NYU, a student must complete 72 points of graduate credit and satisfy requirements 1-7 below.

1. Satisfy a breadth requirement
2. Get involved in a research project
3. Pass a depth qualifying exam
4. Satisfy a teaching requirement
5. Write and defend a thesis proposal
6. Write and defend a PhD thesis
7. Satisfy general NYU degree requirements
8. Remain in good academic standing

1. Breadth Requirement

The breadth requirement is designed to ensure competence across three broad areas of computer science: theory, systems, and applications. Within theory, the topic of algorithms is a requirement for every student.

Every student must complete requirements (1a), (1b), (1c), and (1d) below by the end of the student's second year of study in order for support to be continued. The breadth requirement form, which is available on the [forms](#) page for PhD students, helps the student to collect all the information necessary to verify that the breadth requirements were completed. The verification is done by the PhD Program Administrator, and the final approval is given by the Director of Graduate Studies for the PhD Program (DGS hereafter). The completed form must be submitted to the Program Administrator.

(1a) Algorithms

Every student must receive a grade of A or A- on the final examination in the Honors Algorithms course. Students may take the final exam without being enrolled in the course.

The syllabus and final exam for every offering of the Honors Algorithms course will be determined by a committee of faculty members who routinely teach this class.

(1b) Systems

This requirement can be satisfied by receiving an A or A- in an approved course in systems listed in [Appendix](#).

(1c) Applications

This requirement is satisfied by receiving an A or A- in an approved applications course listed in [Appendix](#).

(1d) Free choice

The student must either:

1. receive an A or A- in an approved course in theory listed in [Appendix](#) or
2. receive an A or A- in an additional course from the courses that can be used to satisfy requirements (1b) or (1c). This course cannot coincide with the courses used to satisfy (1b) and (1c).

Once a student has passed all courses and exams necessary to satisfy the breadth requirement, the student must inform his or her academic advisor in writing, specifying how each of parts 1a, 1b, 1c, and 1d has been satisfied. The academic advisor verifies that the breadth requirement rules were followed and forwards the information to the DGS.

The classes that can be used to satisfy breadth requirements will be reviewed regularly by the graduate curriculum committee; The graduate curriculum committee proposes the changes to the faculty for approval. The current list of approved classes can be found in the appendix.

The following standards will be maintained:

(a) Classes must be at the PhD level, i.e., more advanced than undergraduate or MS-level classes.

(b) The classes and exams must be rigorous and stable. Examples of inappropriate classes include those in which students are traditionally not differentially evaluated (e.g., all students receive As or "pass"), courses whose content completely changes from year to year, and courses in which grades are based on attendance or making a presentation of someone else's paper, rather than on tests and homework assignments.

(c) Acceptable systems classes will involve substantial software development.

2. Research Project

By the end of the first semester of the student's second year of study, each student must be involved in a research project under the guidance of a faculty research advisor. It is the responsibility of each student to find a faculty advisor and a research project, and to inform the DGS about his/her choice of advisor. Students must inform the DGS if they change the research advisor.

3. Depth Qualifying Exam

Students are required to form a depth qualifying exam (DQE) committee of at least three faculty members, one of which is the research advisor, and have that committee, an exam topic and a tentative date approved by the DGS by the end of the first semester of their second year of study. The committee will have a designated chair who is not the student's research advisor.

The DQE committee will define a syllabus, which must be approved by the DGS, and make the syllabus available to the student no later than two weeks before the exam.

The DQE has two parts:

(2a) An examination to demonstrate the student's knowledge of the research area. The scope of this exam should be similar to a typical PhD-level special topics course. It should not be as broad as an introductory course nor as narrow as a thesis. Examples of suitable topics are "Type theory in programming languages", "Probabilistic algorithms", "Computational learning theory", "3-D modeling", "Semidefinite programming", and "Low-power computing". Topics such as "Databases" or "Programming languages" would be too broad; topics such as "Voronoi diagrams" or "Tail-recursion optimization" would be too narrow. This exam may be oral or written, at the discretion of the committee. The requirement is that it seriously tests the student's knowledge of a research area as distinct from the student's research accomplishments.

(2b) An oral presentation of the student's research accomplishments. A student is expected to have conducted original research by the time of the exam. This research may have been carried out independently or in collaboration with faculty, research staff, or other students. Students are encouraged, but not required, to have publication-worthy results by the time of the exam. It is not sufficient for a student to present a survey of previous work in an area or a reimplementation of algorithms, techniques, or systems developed by others.

The committee, by majority vote, gives a separate grade for (2a) and (2b) as one of "High Pass", "Low Pass", or "Fail." A High Pass on both parts must be achieved for support to be continued beyond the second year. A student who does not receive a High Pass in both parts may request permission to retake the exam. The request must be submitted to the DGS who will decide it in consultation with the DQE committee. A student who receives a "High Pass" on only one part of the exam may request permission from the committee to retake only the other part of the exam. If a student requests to form a new DQE

committee when retaking the exam, the request must be approved by the department's fellowship committee. This exam may be taken no more than twice.

If a student has passed the DQE and then changes his/her area of research, the student need not retake the DQE.

4. Teaching Requirement

By the end of the third year of study, each student must have served as a section leader of at least one course in the department. Courses on related topics outside the department may also be used to satisfy this requirement subject to approval by the DGS. The student must also participate in the department's teacher training session at or prior to the semester in which they teach. In certain circumstances, the DGS may allow the student to satisfy this requirement by serving as a course assistant or as a grader. These exceptions will be determined by the DGS based on the availability of suitable recitations.

5. Thesis Proposal and Presentation

Students are required to form a thesis proposal committee and have the committee and a tentative date for the thesis proposal presentation approved by the DGS by the end of the first semester of their third year of studies.

When a student is ready to start work on the PhD thesis, the student must (i) select, with the approval of his/her research advisor and the DGS, a thesis reading committee, and (ii) submit a written thesis proposal to the committee.

The student and the student's research advisor suggest the composition of the thesis reading committee for approval by the DGS. The committee must include at least three members. All changes to the composition of the committee must be approved by the DGS. The committee members can be regular computer science faculty, faculty from other departments, or individuals of like standing from outside the University. At least one member of the reading committee must be a regular Computer Science faculty.

The thesis proposal should include:

- a description of the research topic
- an explanation of how the research will advance the state of the art, and
- a tentative research plan

After the thesis reading committee has approved the thesis proposal, the student should schedule a thesis proposal presentation and notify the PhD Program Administrator once this has been finalized.

Substantial subsequent changes to the thesis topic must be approved by the thesis reading committee. The proposal must be defended no later than May 15 of the third year of studies.

6. Thesis and Thesis Defense

The final step in the PhD program is the student's defense of his/her PhD thesis. The procedures to be followed for the thesis defense can be found on the Dissertation Defense Checklist.

7. General NYU Requirements

Students must end the semester in which they take their fifth class and all subsequent semesters with a GPA of 3.5 or higher. Note that the departmental requirement in this case is more stringent than the GSAS requirement (cumulative GPA of at least 3.0).

In addition, the following general GSAS requirements have to be satisfied:

1. Students must complete three years of full-time study beyond the undergraduate degree, at least one year of which must be in residence at the GSAS.
2. Students must complete 72 points of graduate credit including at least 32 points for courses taken at the GSAS. At any time, students must have successfully completed 66 percent of credits attempted while at NYU, not including the current semester. Courses with grades of I, W, and F are not considered successfully completed.
3. **Time Limit.** All requirements for the doctoral degree must be completed no later than ten years from the initial date of matriculation. However, if the student transfers credit from classes taken as part of a previously earned master's degree, then the time limit is seven years.

Other GSAS and NYU requirements can be found in the GSAS Bulletin.

8. Academic Standing

To be in good academic standing a student must meet the deadlines for all requirements specified in this document and maintain the required minimal GPA. For supported students, maintaining good academic standing is a condition of the guaranteed support. If a student fails to maintain good academic standing, his or her support may be discontinued, and the student may be removed from the program. A student's academic standing is determined by the DGS each semester. The PhD admissions and financial aid committee decides in which cases support is discontinued. In most cases, a student will be removed from the program when his or her support is discontinued for failure to maintain good academic standing.

Registration

Academic Advising

All PhD Computer Science students need advisor approval before they can register for courses. Students can get advisor approval by contacting the PhD Program Administrator with their proposed schedule of courses. Students will be notified that the advisor approval process is to begin about one month before registration opens for the following semester. Students should be sure to review the course schedule for the upcoming semester, so they have an idea of the courses they are interested in taking.

Once the advisor approval process has been announced, students should request advisor approval as soon as possible. Waiting to the last minute can delay the ability to register. Please be aware of the applicable registration dates and possible late fees. These are listed on the official NYU Academic Calendar.

Registration Appointments

Students are given an appointment time for registration. Students can register after that date and time, but will not be able to register before that date and time. Students will be blocked from registering until they have been given advisor approval.

Registration Holds

All PhD students will have an advisor approval hold on their account. A student cannot register until that hold is removed by the PhD Program Administrator. It is possible for a student to have additional holds that will block a student from registering. A Past Due Balance and missing Measles/Mumps/Rubella Vaccination are examples of holds that may block a student from registering. Click on "Details" in the "Holds" section on Albert to see the contact information for how to resolve the hold. Students are advised to check their holds and resolve any outstanding holds that would block them from registering before registration begins.

Enrollment Cap

All PhD students have an enrollment cap of 9 credits. This means that a student can only enroll for 9 credits in a given semester. The system will not allow a student to enroll in an additional course, if the student is already enrolled for 9 credits or if the additional course would bring the total of enrolled credits over 9. If a student wants to request permission to take more than 9 credits in a given semester, the student needs to submit a request to the Program Administrator. If approved the student will be allowed to enroll for more credits in the semester requested.

Swap Function

Please note that it is very important to make proper use of the swap function, especially if a student has signed up for waitlists. When using swap for a waitlisted course, the student is basically telling the system they are enrolled in course A and If they can get into course B which they are waitlisted for, then they wish to be dropped from course A.

If a student is enrolled for 9 credits and have also signed up for a waitlist, then they must use the swap function, or they will not be able to enroll in the waitlisted course. For example, if a student is enrolled for 9 credits and on a waitlist but did not use the swap function, when it is their turn on the waitlist, the system will see that they are already registered for the maximum number of credits allowed and will not enroll them. The student will remain on the waitlist but will not be enrolled.

Students must also use the swap function if they are on a waitlist for a course that meets at the same time as a course that they are enrolled in. For example, if a student is registered for a course that meets on Mondays from 5:10pm-7:00pm and waitlist a course that meets on Mondays from 5:10pm-7:00pm, then the student must set it up as a swap. If they do not and the system tries to enroll them off of the waitlist, it will see that they already are registered for a course that meets at that time and it will not enroll them into the waitlisted course.

Please refer to the links below for instructions on how to use the swap function on Albert.

- http://www.nyu.edu/registrar/sis/student-registration-swap-classes.html
- http://www.nyu.edu/registrar/sis/student-registration-edit-swap-classes.html

Maintaining Matriculation

If a student does not plan on registering for any credits in any particular semester, with the exception of the summer, the student must register for Maintenance of Matriculation (MAINT-GA 4747-004). Students will still need to set up an appointment and gain advisor approval to register for Maintenance of Matriculation. More information is available on the [Maintenance of Matriculation page.](#)

PhD. Internships

The department encourages students to go on internships, whenever there is academic justification for doing that. A student who wishes to go on a for-credit internship, should:

1. No later than a month prior to the internship's start date, submit a request to the DGS and the research advisor, together with a plan for the internship sufficient to evaluate its academic quality and relevance.
2. The student's research advisor submits a support letter to the DGS.
3. The DGS decides whether to approve the request, possibly after consulting with the research advisor and the host.
4. At the end of the internship, the student should submit a report to the DGS. The host submits an evaluation of the internship and approves the student's report. Based on this, and possibly after requesting additional information, the DGS decides on a grade for the internship.

The above applies to both summer for-credit internships and to for-credit internships during the academic year. Special scrutiny would be applied in the latter case, to make sure the internship does not interfere with the student's remaining commitments. Also, in the latter case, internships are limited to 20 hours a week. Internships that are not taken for credit are not subject to these rules.

For-credit internships cannot be taken more than 4 times.

Please note that, as a for-credit course, internship dates should be aligned with the start and end dates of an academic semester. Please refer to the [Graduate Academic Calendar](#) for semester dates.

The course number for for-credit internships is [CSCI-GA.3870-002](#).

Internship Qualifications

To qualify for an internship, a student must meet the following qualifications. A student:

- must be in good academic standing,
- must not be on probation,
- must have a minimum cumulative grade point average of 3.5,
- must have successfully completed at least 66% of courses attempted.

Students not in good academic standing will not be approved for internship opportunities.

Students who are approved for internship credit will register for CSCI-GA 3870-002 Internship in Computer Science:

CSCI-GA.3870 Internship in Computer Science, Graduate-level. Fall, Spring, Summer. International students interested in internships for course credit can utilize Curricular Practical Training (CPT), if eligible. Students should review the requirements and qualifications for CPT on the NYU Office of Global Services (OGS) website. Getting authorization through OGS takes additional time. Students should be sure to apply early for their internships. International students in our PhD programs may only work 20 hours or less per week during the fall or spring semesters.

Graduation and Employment Authorization

Applying for Graduation

Students who plan on graduating should apply for graduation on Albert by the beginning of their final semester. It is the student's responsibility to apply for graduation within the specified graduation application period.

- Students apply by clicking the "Apply for graduation" link under Academics in your Student Center.
- Students can check their application status in the Student Center under Academics by clicking the "View my graduation status" link.

Employment Authorization for International Students

Optional Practical Training (OPT) is temporary employment that is directly related to the student's major field of study. If a student wishes to work off-campus as an F-1 student, one way to do so is to be approved for OPT. The student cannot begin work on OPT until they receive approval in the form of an Employment Authorization Document (EAD) and it is within the dates listed on their EAD. It takes around 4-6 months to get approved for OPT so please plan ahead. If there are general questions about OPT, the student should contact their advisor.

See requirements and instructions for applying to OPT at the Office of Global Services website.

GSAS Policies and Procedures

The Graduate School of Arts and Science (GSAS) is committed to providing a supportive and structured environment for the development of scholars, researchers, and teachers. It is expected that the responsibilities of students, faculty, and staff will be discharged with impartiality, reason, and consistency. To this end, it is the responsibility of all members of the GSAS community to respect and comply with all GSAS Policies and Procedures as well as all University rules and policies. Details regarding GSAS graduate curriculum, admissions, coursework and assessment, enrollment, graduation, academic probation and termination, discipline, and grievances can be found in the GSAS Policies and Procedures Manual.

Questions or Concerns

Students may bring their questions or concerns on any academic or student life issue to the DGS and/or the PhD Program Administrator. The student can discuss the matter and share their perspective. The

department provides a confidential, supportive environment to discuss matters impacting the student and will seek to assist the student to resolve the issue or direct the student to the proper office for assistance. The department maintains a record of incidents for the purpose of identifying patterns of inappropriate or negligent behavior.

Please note that if the student's concern involves discrimination or harassment, the department is obliged to report the issue to the Office of Equal Opportunity, which is the University's neutral unit charged with investigating all such cases.

Appendix

Required Forms

- PhD Degree Requirements Form

List of Approved Courses for Breadth Requirements

The following courses can be used to satisfy the breadth requirements:

1a. Algorithms

- CSCI-GA.3520 Honors Analysis of Algorithms

1b. Systems

- CSCI-GA.2243 High Performance Computer Architecture
- CSCI-GA.2434 Advanced Database Systems
- CSCI-GA.2620 Networks and Mobile Systems
- CSCI-GA.2621 Distributed Systems
- CSCI-GA.3110 Honors Programming Languages
- CSCI-GA.3130 Honors Compilers
- CSCI-GA.3140 Abstract Interpretation
- CSCI-GA.3250 Honors Operating Systems

1c. Applications

- CSCI-GA.2270 Computer Graphics
- CSCI-GA.2271 Computer Vision
- CSCI-GA.2560 Artificial Intelligence
- CSCI-GA.2565 Machine Learning
- CSCI-GA.2566 Foundations of Machine Learning
- CSCI-GA.2567 Machine Learning and Computational Statistics
- CSCI-GA.2572 Deep Learning
- CSCI-GA.2590 Natural Language Processing

NOTE: Only one of these classes can be counted for breadth requirements (either Applications or Free Choice). Machine Learning emphasizes applications, and Foundations of Machine Learning emphasizes theoretical aspects of machine learning, although both include theoretical and practical components. Please familiarize yourself with class requirements and consult your academic advisor before choosing one of these classes.

1d. Free choice

Any of the courses listed under 1b and 1c, or any of the following courses:

- CSCI-GA.2390 Logic in Computer Science
- CSCI-GA.2420 Numerical Methods I
- CSCI-GA.2421 Numerical Methods II
- CSCI-GA.2945 Numerical Optimization
- CSCI-GA.2945 Convex and Non-Smooth Optimization
- CSCI-GA.3210 Introduction to Cryptography
- CSCI-GA.3350 Honors Theory of Computation

Checklist for Incoming Students

New York University (NYUHome) Accounts

Upon admission, all NYU students are assigned an NYUHome account based on their NetID. You can activate your account by visiting the NYUHome Start Page. You will be prompted with instructions from there. Your user ID for this account is your NYU NetID, which is printed on the back of your NYU photo ID card.

Courant Institute of Mathematical Sciences (CIMS) Accounts

All CS and Math graduate students are eligible for Courant computer accounts. To obtain a CIMS account, go to the Courant Computer Accounts page.

For more information regarding general computing resources at Courant, visit the Courant Computing Resources page.

Department Mailing Lists

Please click on the links below to subscribe to the various departmental mailing lists. **Note that you must subscribe using either your Courant or your NYU e-mail address.**

opportunities@cs.nyu.edu is a list that the department uses to post educational, research, and job opportunities. Employers wishing to post jobs or internships to the opportunities@cs.nyu.edu list should follow the instructions on the prospective employers page.

cschat@cs.nyu.edu is open to all department members and is used to post announcements and queries of potential interest to the Computer Science Department community.

colloq@cs.nyu.edu is used to announce talks and seminars in our department and related fields.

In addition to the private lists shown above, you may also browse the department's public mailing lists. **Note that this page is only accessible from within the NYU network.**

GSAS New Student Checklist

The Graduate School of Arts & Science also provides a new student checklist with additional information to help you get started at NYU.

GSAS Bulletin - http://gsas.nyu.edu/bulletin.html

GSAS Policies and Procedures -

https://gsas.nyu.edu/content/nyu-as/gsas/about-gsas/policies-and-procedures/policies-and-procedures-manual-and-forms.html