

THE
GRADUATE
CENTER

CITY UNIVERSITY
OF NEW YORK

PH.D. IN COMPUTER SCIENCE



OUR PROGRAM

CUNY GC Ph.D. Program in Computer Science prepares selected students for leadership positions in research and development careers in CS and IT industry, as well as for research and teaching positions in academia institutions. Our Ph.D. candidates master the CS discipline in its broadest sense, in the same time obtain in depth knowledge of a specialized area and perform independent innovative research in cutting edge fields.

- We have over 100 participating faculty members, most of whom are globally recognized scholars.
- We have a rich curriculum that enables students with many technical and theoretical skills in a variety of fields ranging from Algorithm, Artificial Intelligence, Cryptography, Programming Language, Machine Learning, Natural Language Processing, to Computer Vision, Data Visualization, Data Mining, Computer Networks, Information Security, and many more.
- Our stipends, tuition coverage and benefits are competitive, regardless of citizenship.
- Our midtown Manhattan location (5th avenue and 34th street) provides students better access to internship or full-time positions at top research centers and companies across different industries in NY area.
- Our alum network covers most top companies in IT, Finance, and other industries, and many top universities domestically and internationally.

APPLICATION

Any individual seriously considering applying for entrance into the Ph.D. Program in Computer Science should consult [The Graduate Center Bulletin](#) and [The Graduate Center Student Handbook](#): both sources provide an excellent and comprehensive guide to Graduate School policy and services. All interested individuals must consult [Application Instructions Forms](#). We present in this section some additional information.

The Graduate Record Exam (GRE)

GRE scores must be received for each applicant, and cannot be waived. Applicants should have a quantitative score preferably in the 90 percentiles but not lower than the 80th percentile. Verbal scores should be above the 50th percentile. Please refer to www.ets.org/gre/concordance for converting scores between old and new grading formats. (Students with lower scores may be, under special circumstances, considered for admission.)

Background and whether a Masters degree required for admission?

- Admission to the Program should be considered only by those individuals who have done exceptionally well in their previous university studies in Computer Science, Mathematics or related sciences. A Masters degree is not a 'formal' prerequisite for admission but is strongly recommended. Applicants who do not have an MS or MA degree in Computer Science (or a related field) should demonstrate exceptional promise and sufficient background for entrance in their applications. Specifically, entering students are expected to have a background (minimally at an undergraduate level) in the following areas: Operating Systems, Fundamental Algorithms, Object-Oriented Programming, Databases, Discrete Mathematics, Computer Architecture, Theoretical Computation, Programming Languages, Probability, etc.

On rare occasion, students may be admitted with deficiencies in their backgrounds and will be required to take certain graduate or undergraduate courses to compensate. Graduate courses required to fulfill deficiencies may be included in the first thirty credits for the degree – if approved by the Program's Executive Officer – and the student achieves a minimum grade of B in the course.

REQUIREMENTS

Registration Requirements- Matriculated students in the Program are required to be "in status," that is, they must be either officially registered for course work and/or research, or on approved leave of absence for each and every semester until the completion of all degree requirements. No more than four leaves of absence are allowed, and each requires the Program EO's permission. International students should consult [the Office of International Students](#) for guidelines concerning the special considerations under which leaves of absence can be granted.

Degree Requirements (Courses)- Each student in the Program is required to complete a minimum of 60 credits of approved graduate courses, with a GPA equivalent to a B or better. Students entering the Program who have completed graduate course work in Computer Science or a related field prior to entry into the Program may petition the Executive Officer to evaluate this course work for the purpose of advancing credit toward the doctorate. Transferable course work will be given after successfully passing the First Exam. No transfer credit will be given for any courses completed at other institutions with final grades lower than "B." Similarly, no credit can be transferred for courses for which the student received an "incomplete" or for which no grade has been entered on the student's official transcript. A maximum of 30 acceptable graduate credits taken prior to admission into the Ph.D. Program in Computer Science may be applied to the degree. During the first year of matriculation, student must take certain (i.e. required) classes. See Level I below.

Residency Requirements- At least 30 of the credits for the doctoral degree must be taken in residence at the City University of New York. Doctoral students are expected to spend at least one year in full-time or certified full-time residence at CUNY; this consists of a schedule of no fewer than seven credits, or the equivalent, for each of two consecutive semesters. International students must be considered full-time throughout their time in the Program.

Time Limits- A student who matriculated after the completion of 30 credits of acceptable course work (e.g. after having completed an MS or MA degree in Computer Science or a related field) must complete all academic requirements within 14 semesters (otherwise within 16 semesters). Leaves of Absence (LoA's) effectively stop the clock for the semester(s) a student may be awarded one; LoA's are not counted in the total number of semesters allowable in which to complete the degree. Students may request up to four semesters of leave during their time in the Computer Science Ph.D. Program. LoA's are awarded at the discretion of the Executive Officer and are given on a semester basis. Deadlines for requesting a LoA are published in the Semester Announcement of Courses, included with a student's registration materials. These deadlines are strictly followed. A student may not fulfill any academic requirement while on a Leave of Absence (no First Exams, Second Exams, Advancement to Candidacy, etc.)

LEVELS TO THE PHD PROGRAM IN COMPUTER SCIENCE:

There are three levels of students: level I, level II, and level III. These levels govern not only progress in the PhD program, but also how the tuition costs are determined. Under Academic Policies and Procedures of the student handbook, you can find the details in the schedule of tuition charges as a function of level. All Entering students are Level I

GENERAL REMARKS:

Students must register for at least 7 credit hours each semester to be fully enrolled. For international students this is particularly important to maintain their visa status. Weighted Instruction Units (WIU) can be included in the required 7 credit minimum.

Watch the GC calendar for changes in class schedules. Some weekdays may have no classes while others may follow the schedule for another day.

Pay close attention to last dates to add and last dates to drop classes. These are also listed on the GC calendar.

Starting Fall 2018, the independent study policy is to allow one independent study. To count for your 60-credit requirement

LEVEL 1:

The academic goal of this first study period is not only to complete the required course work (see below) and to gain a firm foundation in different areas of Computer Science but also to establish and develop rapport with members of the Doctoral Faculty. Identifying a (potential) mentor working in a field of research of interest to the student should be considered a desirable goal at this early stage. And this, in turn, should lead to the eventual establishment of the student's Examining Committee. The program offers core courses in three broad research areas as listed in the following:

Algorithms and Theory

- C Sc 70010 Algorithms
- C Sc 73010 Cryptography and Computer Security
- C Sc 71010 Programming Languages
- C Sc 75100 Logical Fundamentals of Computer Science

Artificial Intelligence

- C Sc 74011 Artificial Intelligence
- C Sc 74020 Machine Learning
- C Sc 74030 Computer Vision and Image Processing
- C Sc 74040 Natural Language Processing

Systems and Computational Science

- C Sc 72010 Computer Networks
- C Sc 72020 Distributed Operating Systems
- C Sc 72030 Database Systems
- C Sc 76010 Parallel Scientific Computing

Students must complete the following requirements to complete the First Exam:

- Take CSc 70010, the Algorithms course, and pass its final exam with a score of at least 70 points out of 100, with at most two attempts.
- Pass four core courses, Algorithms being one of the four, with at least one core course from each of the three research areas defined above, with an average grade of B+ (GPA 3.3).
- Complete CSc 80010, the Research Survey course.

It is recommended that the students should finish the above requirements by the end of the fourth semester after they join the program.

LEVEL 2:

Requirements To Advance To Level II

Finish First Exam

45 Credit requirements

Students are required to take courses for a total of 45 credits to advance to Level II of the program. Students, who come into the program with a Master's degree in computer science, or related disciplines may transfer up to 30 credits of their courses to satisfy GC course credit requirements. To transfer a course credit, the student must have attained at least a B course grade. Course grades of P or S can be allowed if those courses satisfied the requirements of the awarded master's degree.

Finding an Area of Research and a Mentor

Selecting a focused area of research and or a mentor is challenging – and important. Every student should learn as much as possible about the Program's faculty and research areas in the first year of study and be ready by the second year (or at the latest the third year), to choose a mentor also known as, an advisor.

The Second Examination

Students are required to pass a Second Exam before they can advance to Level III status. In order to pass this Second Exam students are required to:

- Select a Second Exam Committee. Committee must include your advisor and at least two members of the doctoral faculty in Computer Science or a related interdisciplinary field.
- Orally present a survey with a written report to a Second Exam Committee which approves the presentation and report.
- Complete at least two three credit 80000 level courses above 80020.
- Have no incompletes left on the record and maintain at least an average grade of B
- Complete 60 credits, at least 30 of those in residence

When the above items are completed the student is identified as having completed the Second Exam and advances to Level III, which is also called candidacy.

LEVEL 3:

Dissertation Proposal

Level III students must write a Dissertation Proposal that will convince their Committee that they have identified a topic that is worthy of doctoral research, both for its originality and for its significance, and that they have an approach to handling this topic that shows they are conversant with the state of the art directly relevant to their proposed research and that it is doable in a reasonable amount of time. This document should show that they have insight into the problem and what open problems still exist.

The Dissertation Proposal Examination has a written and oral component. The written part must be distributed to your committee and the Executive Officer at least three weeks prior to the oral presentation. The Committee must consist of at least three faculty members on the doctoral faculty of one of the Graduate Center PhD programs, with your advisor being a member of the CS Doctoral faculty. In addition, the committee must have one outside member.

The outside member should be an expert in your research area and can be from a university, government lab, or high-tech company.

The oral examination should be designed to last 45 minutes, without an allowance for questions. Part of the presentation should be an approximate timeline of the time you estimate for the components of your final dissertation. The candidate should be prepared for the committee to ask probing questions.

(Should a student significantly change the area of intended research in the interim between the successful completion of the Second Exam and the Dissertation Proposal, the student's Second Examination Committee may require that he or she show proficiency in another area of Computer Science more closely related to the new topic of research by passing another examination in the same format.)

DISSERTATION:

At this final and most challenging phase in the Ph.D. Program, students engage in original research, aiming to make a significant and new contribution to their field of study (under the direction of their advisors). A dissertation defense and a final thesis are required

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