

The Ph.D. program in Computer and Information Sciences

The Ph.D. program in Computer and Information Sciences offers an opportunity for exceptional students to pursue research in the computer and information sciences and related areas. The program is highly selective and is purposefully kept small so that each Ph.D. student can receive substantial advising and mentoring from CDM faculty. To earn a Ph.D. degree, a student must demonstrate breadth of knowledge in at least two research areas and significant depth in a chosen dissertation area. In addition, the student must conceive, write and defend a Ph.D. dissertation representing a significant and original contribution to current academic research as demonstrated by a public dissertation defense and publication in established peer-reviewed academic conferences and/or journals.

In keeping with the CDM philosophy of blending academic and professional pursuits, full-time employed students will be considered for admission as part-time doctoral students. However, these applicants must have sufficiently flexible work schedules to allow them to attend required meetings and academic seminars that occur during daytime working hours throughout their degree program. In addition, many working students will find that they must take a leave of absence or cut back to part-time employment for some time period during the research and candidacy phases of the degree program.

Applicants must:

- Hold a master's degree in Computer Science, Information Systems or an allied field. (Please see exemption below)
- Submit three letters of recommendation.
- Show definite promise for completing the program.
- Submit a written statement describing their accomplishments, goals and interests.
- Submit a completed application form.
- Submit an official score report of the Graduate Record Examination (GRE) general examination.
- Applicants educated outside of the United States must demonstrate English proficiency with a TOEFL score of 580 or greater.

Students without a master's degree in computer science or an allied field may be considered for conditional admission to the doctoral program. These students must have an exceptional undergraduate record. A conditionally admitted student will be required to complete a doctoral prerequisite phase consisting of a set of courses determined to be appropriate for the student by the Ph.D. committee. These courses will include courses from the Foundation Phase of the Master of Science in Computer Science or Information Systems programs. Upon completion of the prerequisite phase, the Ph.D. committee will conduct an evaluation of the student's progress. Assuming such progress is satisfactory, the student will then be formally admitted to

the doctoral program. Note: It is not the policy of the College to award a master's degree to a student enrolled in the Ph.D. program.

The Ph.D. Admissions Committee determines which applicants will be admitted to the program. Because the College admits only a limited number of students to the Ph.D. program, meeting the admission standards does not guarantee acceptance.

Students employed outside of the University can be admitted as part-time doctoral students.

Students who can devote themselves full time to their doctoral studies can be admitted as full-time doctoral students.

The College has a limited number of scholarships available to fund full-time Ph.D. students. Only full-time students will be considered for substantial financial aid stipends. The deadlines to apply and submit all required supporting documents are:

- **For Winter Quarter:** October 1
- **For Autumn Quarter:** January 15

Completeness of Admission Credentials

When important pieces of information such as transcripts are lacking, the College is compelled by University regulations to withdraw the application from consideration for admission. It is the applicant's responsibility to ensure that all materials are submitted on time.

Overview of the Degree

The Doctor of Philosophy in Computer and Information Sciences degree follows three phases, which may overlap:

- Inquiry
- Research
- Candidacy

The Doctor of Philosophy in Computer and Information Sciences degree has two different tracks, which differ primarily in the structure of the Inquiry phase. Students must choose whether to enter the Computer Science or Information Systems track.

During the **Inquiry Phase** students in the Computer Science track will complete coursework, initial research projects, and two Breadth Examinations. They must also prepare themselves for a Depth Examination in their chosen area of research. This Depth exam will be completed during the Research phase. Students in the Information Systems track will complete coursework, research projects, and a comprehensive exam.

The choice of breadth exams must be approved by the student's PhD advisor. Each Breadth Examination will verify that the student has knowledge sufficient to teach an introductory

graduate course in that area. A student must pass both exams. Students who fail a Breadth Exam must re-take and pass the exam from the same breadth area in order to satisfy the breadth requirement. The Breadth Exam from each area can be re-taken at most once. Re-takes of breadth exams, or deviations from this policy due to special circumstances must be approved by the Ph.D. committee.

During the **Research Phase** students will conduct focused research leading to successful completion of a Dissertation Proposal. A Ph.D. student enters the Research Phase when he or she has chosen an area in which to do dissertation research and has found a faculty member willing to act as his or her Dissertation Advisor. The Research Phase may overlap with the Inquiry Phase, in fact, students are strongly encouraged to begin their research, under the supervision of a faculty Ph.D. advisor, as early as possible upon entering the program.

Students will be assigned an advisor upon acceptance into the Ph.D. program; however the student may either choose to work with this advisor or else is responsible for approaching a different faculty member to act as their Dissertation Advisor. The faculty member may request that the student perform additional projects or research before agreeing to be the Dissertation Advisor. The student and Dissertation Advisor then work together to choose three additional faculty which, together with the Dissertation Advisor, form the Dissertation Committee. Three of the members must be full-time faculty members in the School of Computing. The fourth committee member must be a recognized scholar from outside the College of CDM whose expertise is pertinent to the topic of the dissertation. The members of this committee must be approved by the College's Ph.D. Committee.

During the research phase, the doctoral student, in conjunction with his or her Dissertation Advisor, will conduct extensive readings in academic texts, journals, and conference proceedings to become an expert in the chosen research area.

Once the student has enough preliminary results that the student and advisor are confident that the work should result in publishable results, the student will write an extensive review of previous work in the area and a research proposal for the dissertation research. The Dissertation Committee members will then choose a date for a public defense of the dissertation proposal. The student will provide an oral presentation of current results and future research goals at this defense. The proposal will be approved only if the Dissertation Committee agrees that the work that is planned will constitute an acceptable Ph.D. dissertation. The committee may recommend that the student repeat the proposal at a later date. The dissertation committee may require additional components in conjunction with proposal defense to test the student's depth of knowledge in the specific area of dissertation research. Students may not defend their Dissertation Proposal until all depth and breadth or comprehensive exams are completed.

During the **Candidacy Phase** the Candidate conducts further research, and writes and defends the Ph.D. Dissertation.

To be admitted to candidacy, doctoral students must complete the following:

- **Residency:** Three quarters of full-time study must be completed at DePaul University beyond the master's level. Full-time study is defined as registration for a minimum of eight credit hours (typically two courses) per quarter. With prior approval of the Ph.D. Committee, students may satisfy residency requirements by coursework, participation in seminars, or research performed off campus.
- **Allied Course:** Specific courses as specified for each track under course requirements.
- **Doctoral Examinations:** Pass two Breadth Examinations and one Depth Examination (Computer Science track) or pass Comprehensive Examination (Information Systems track).
- **Defense of Proposal:** Successfully defend a Dissertation Proposal.

Except in very unusual situations, the student will be required to publish some portion of the dissertation as an academic paper in a refereed journal or conference before completing the degree. This will demonstrate that the significance of this work is recognized in academic communities outside DePaul University.

After the dissertation has been written, the student will provide a copy to all members of the Dissertation Committee. After reading the dissertation, the Dissertation Committee must recommend whether or not a public dissertation defense should proceed. In particular, the members of the Dissertation Committee will determine whether the completed dissertation embodies the work that was promised in the dissertation proposal. The committee may recommend modifications or additional research to be completed before the defense can take place. Once the Dissertation Committee agrees that the defense should take place, a date will be scheduled for the dissertation defense. After the defense, the Dissertation Committee will determine whether all work has been satisfactorily completed or additional work or modifications must be made.

The dissertation will be submitted to DePaul library following the currently published procedures. These will include making the dissertation available online where it will be permanently available to the public. Consult the Handbook for Graduate Studies at the back of this bulletin for information on submitting the dissertation and abstract to the College. Contact the Student Services office for additional information regarding procedures to follow for binding the dissertation.

Course Requirements

Ph.D. students with a master's degree are required to complete a minimum of 60 credits (typically 15 courses) of graduate classes.

These credits must include at least 48 credits of courses in the 420-599 range, including CSC 426: Values and Computer Technology. Information Systems track students must also complete IS 590: Information Systems Research Methods.

Students may enroll in CSC 699 only after completion of the Breadth Examinations. Conditionally admitted students must complete an additional 52 credits (typically 13 courses) of graduate classes, including at least 36 credits of courses in the 420-599 range. The written approval of the Ph.D. Committee is required, before registering, to apply courses taught outside the College towards the doctoral program course requirements.

Student Progress

Student progress will be evaluated annually. Students must maintain a grade point average of 3.5 or better to remain in good standing in the program. Any course grade below B- is unsatisfactory and will not be counted toward degree requirements. The Ph.D. Committee will recommend a student for dismissal from the doctoral program if the members judge that that student is not progressing satisfactorily toward the degree.

Continuous Enrollment

Prior to candidacy, a student must continuously enroll for at least one academic credit per quarter during every Autumn, Winter and Spring quarter. A student may apply to the Ph.D. committee for a leave of absence from this continuous enrollment requirement if exceptional circumstances arise.

After admission to candidacy, a student must continuously enroll for at least one course per quarter during every Autumn, Winter and Spring quarter, but may enroll for CSC 701 Candidacy Continuation (0 academic credits) with advisor's approval.

Time Limits

For part-time doctoral students:

- No more than three years between admission to the doctoral program and completion of Breadth Examinations.
- No more than three years between completion of Breadth Examinations and admission to Candidacy.
- No less than eight months and no more than five years between admission to Candidacy and the dissertation defense.

For full-time doctoral students:

- No more than two years between admission to the doctoral program and completion of Breadth Examinations. Note that students funded by SOC or other stipends will be required to meet more stringent requirements.
- No more than two years between completion of Breadth Examinations and admission to Candidacy.

- No less than eight months and no more than five years between admission to Candidacy and the dissertation defense.

Consult the Handbook for Graduate Studies for graduation application deadlines and the deadline for submitting completed dissertations.