COMPUTER SCIENCE (PHD)

The PhD in Computer Science is a new research-focused doctoral program with the objective to help students develop proficiency in conceptualizing and implementing computer models and tools that address societal needs. This proficiency will enable students to analyze and review critically the scientific work in their area of interest and in the broader field of computer science.

Related Programs

Master's

- Computer Science (MS) (https://catalog.luc.edu/graduate-professional/graduate-school/arts-sciences/computer-science/computer-science-ms/)

Certificate

- Technology Management Certificate (https://catalog.luc.edu/graduate-professional/graduate-school/arts-sciences/computer-science/-technology-management-graduate-certificate/)
- Web Programming Certificate (https://catalog.luc.edu/graduate-professional/graduate-school/arts-sciences/computer-science/web-programming-graduate-certificate/)

Curriculum

The PhD in Computer Science requires 60 credit hours of coursework and a dissertation.

Required Coursework

Code	Title	Hours
COMP 413	Intermediate Object-Oriented Development	3
COMP 417	Social and Ethical Issues in Computing	3
COMP 460	Algorithms & Complexity	3
Three COMP 400-Level Electives		*9*
Four Doctoral Qualifying Courses [1]		**12**
Theory		
COMP 409	Advanced Numerical Analysis	
COMP 431	Cryptography	
COMP 471	Theory of Programming Languages	
Systems		
COMP 410	Operating Systems	
COMP 439	Distributed Systems	
COMP 462	Advanced Computer Architecture	
COMP 464	High-Performance Computing	
Software		
COMP 473	Advanced Object Oriented Programming	
COMP 474	Software Engineering	
COMP 453	Database Programming	
Artificial Intelligence		
COMP 429	Natural Language Processing	
COMP 458	Big Data Analytics	
COMP 479	Machine Learning	
COMP 487	Deep Learning	
Required COMP 500-Level Courses		
COMP 501	Equitable and Inclusive Computer Science Pedagogy	3
COMP 502	Structure of Research Management and Funding	3
COMP 503	Technology Entrepreneurship	3
Dissertation Research		*21*
Total Hours		**60**

[1] To establish qualifications for research, students must take courses covering at least three of the four pillars of computer science (theory, systems, software, and artificial intelligence). A grade of A is required in three courses for successful qualification for doctoral candidacy.

Research and Dissertation

The doctoral program culminates in a dissertation that makes an original contribution to the discipline. Along the way, doctoral students are expected to write peer-reviewed conference and journal articles, engage in community outreach, develop their pedagogical skills, and pursue increasingly complex research projects. Students are also expected to open-source their research projects. The final dissertation must be deposited in a publicly accessible database in accordance with Graduate School policy.

Responsible Conduct of Research

All PhD students and students in thesis-based Master's degree programs must successfully complete UNIV 370 Responsible Conduct in Research and Scholarship or other approved coursework in responsible conduct of research as part of the degree requirements. It is strongly recommended that students complete this two-day training before beginning the dissertation/thesis stage of the program.

Graduate & Professional Standards and Regulations

Students in graduate and professional programs can find their Academic Policies in Graduate and Professional Academic Standards and Regulations (https://catalog.luc.edu/academic-standards-regulations/graduate-professional/) under their school. Any additional University Policies supersede school policies.

Learning Outcomes

Upon completion of the PhD in Computer Science, students will be able to demonstrate:

- Fundamental understanding of the principles, major research findings and current open problems in their area of emphasis
- Effective scientific communication skills
- Proficiency in critical thinking (including social impact)
- Appropriate use of the scientific method
- Technical writing proficiency
- Original scholarship and the ability to conduct independent research
- Understanding of equitable and inclusive computer science pedagogy
- Understanding of the grant proposal development process and various funding agencies