COMPUTER SCIENCE AND ENGINEERING (PHD)

Doctor of Philosophy in Computer Science and Engineering
Unit: Speed School of Engineering (http://engineering.louisville.edu) (GS)
Department: Computer Science and Engineering (https://engineering.louisville.edu/academics/departments/computer/)
Academic Plan Code(s): CSE_PHD

Program Information

General Information

The PhD degree program is intended for persons having an accredited master's and/or baccalaureate degree in computer science, computer engineering, or electrical engineering, but is available to those with other backgrounds. Applicants with other backgrounds should plan on taking some undergraduate background coursework.

Students interested in the PhD degree program should consult the Director of Graduate Studies in the Department of Computer Science and Engineering.

Degree Requirements

The award of a Doctor of Philosophy degree indicates that a student has attained mastery of a field and has demonstrated the capacity to perform independent scholarly research. Candidates for the Doctor of Philosophy degree must have a minimum final cumulative grade point average of 3.00 for all academic coursework attempted in Graduate Studies.

The requirements for the Doctor of Philosophy degree are explained in more detail in the Degree Requirements section (http://catalog.louisville.edu/graduate/general-policies-procedures-requirements/degree-requirements/) of this catalog.

Admission Standards

The admission standards for the PhD program in Computer Science and Engineering are as follows:

1. All admission applications for the program shall include:
   a. A completed graduate application (http://louisville.edu/graduate/futurestudents/apply-materials/application/) for the Graduate School,
   b. An application fee,
   c. Results from the Graduate Record Examination (GRE),
   d. At least two letters of recommendation,
   e. A brief personal statement describing the decision to continue to a PhD program, and
   f. Official transcript(s) for all previous post-secondary coursework. All transcripts not in English must be certified as authentic and translated verbatim into English.
2. The minimum requirement for admission is the baccalaureate degree or its equivalent from an accredited institution.
3. The successful applicant will typically have an undergraduate grade point average of 3.00 or above (on a 4.00 scale).
4. The successful applicant will typically have a GRE combined Verbal and Quantitative Reasoning score of 295 or above.
5. International students whose primary language is not English must show English language proficiency by either TOEFL/IELTS/Duolingo score or demonstration of a degree awarded from an acceptable English language institution. The successful applicant will typically have a TOEFL score of 80 or higher or overall IELTS score of 6.5 or higher or a Duolingo score of 105 or higher.

Program Requirements

Normally, it is expected that the student will complete a master's degree before being admitted to the PhD Program. However, qualified applicants may be admitted directly to the doctoral program after receiving a baccalaureate degree. These students will be required to complete an additional 30 credit hours of coursework at the 500 and 600 level under an individual plan developed in conjunction with the department's Director of Graduate Studies.

Also, remedial work may be specified for any applicant who, in the opinion of the faculty, do not have a sufficient background.

The minimum curricular requirements for the doctoral program are:

Code	Title	Hours
Post-Baccalaureate Courses		
Approved Master's Level Course Work		30
CSE Electives [1]		18
CSE 799	Dissertation Research	9
CSE 795	CSE Seminar	2
Minimum Total Hours		**59**

Candidates for the Doctor of Philosophy degree must have a minimum final cumulative grade point average of 3.00 for all academic work attempted in Graduate Studies.

[1] Master's Level Course Work and/or CSE Electives must be chosen so that eighteen (18) credit hours of courses are taken in the core areas. Two courses are required in each of two core areas and one course in each of the remaining two core areas. The approved courses for the four core areas are listed below.

Computer Software Engineering Core Courses [1]

Code	Title	Hours
CSE 504	Automata Theory	3
CSE 516	Fundamentals of Computer Communications and Networks	3
CSE 530	Design of Compilers	3
CSE 545	Artificial Intelligence	3
CSE 550	Software Engineering	3
CSE 619	Design and Analysis of Computer Algorithms	3
CSE 629	Distributed System Design	3
CSE 630	Advanced Databases	3

Computer Hardware Engineering Core Courses [1]

Code	Title	Hours
CSE/ECE 510	Computer Design	3
CSE 525/ECE 516	Microcomputer Design	4
CSE 611	Computer Architecture	3
ECE 515	Introduction to VLSI Systems	3

Computationally Intensive Applications Core Courses [1]

Code	Title	Hours
CSE 522	Performance Evaluation of Computer Systems	3
CSE 564	Introduction to Cryptography	3
CSE 609	Multimedia Processing	3
CSE 621	Web Mining for E-Commerce and Information Retrieval	3
CSE 622	Simulation and Modeling of Discrete Systems	3
CSE 627	Digital Image Processing	3
CSE 628	Computer Graphics	3
CSE 660	Introduction to Bioinformatics	3
ECE 520	Digital Signal Processing	3
ECE 550	Communication and Modulation	3
ECE 560	Control Systems Principles	3
ECE 614	Deep Learning	3
ECE 619/CSE 633	Computer Vision	3
ECE 620	Pattern Recognition and Machine Intelligence	3

Advanced Mathematics Core Courses [1]

Code	Title	Hours
IE/CSE 563	Experimental Design in Engineering	3
CSE 620	Combinatorial Optimization and Modern Heuristics	3
CSE 632	Data Mining	3
MATH 501	Introduction to Analysis I - CUE	3
MATH 667	Statistical Inference	3
MATH 681	Combinatorics and Graph Theory I	3

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