The Ph.D. in Computer Science and Engineering degree is a certification of critical aptitude in scholarship, imagination, knowledge in the discipline, enterprise in research, and proficiency and style in communication. A candidate obtaining a Ph.D. degree displays a thorough understanding in the major areas of computer science and engineering and must master the necessary tools and techniques to make original contributions to the field of computer science and engineering.

Program Overview

UB's Ph.D. program in Computer Science and Engineering is a rare combination, offering breadth in both disciplines. The program’s teaching and publishing requirements are also unique characteristics. Recognizing that many of its graduates will pursue academic careers, the program requires all students to teach two courses. This experience gives students a competitive edge as they compete for faculty positions. All students must have research articles accepted for publication prior to graduation; this requirement demonstrates to prospective employers that students acquired the expertise to report their research findings in scholarly publications. Another relevant requirement calls for Ph.D. students to finish two courses in global technology management which broadens the knowledge of graduates in a universal market.
Program of Study
The Ph.D. in Computer Science and Engineering requires students to take eight (3-credit hours) courses, or 24 credit hours, in the discipline, including a maximum of two independent study courses.

The student is also required to have a two-semester teaching practicum (3 credit hours each). The students will be expected to teach undergraduate level classes, and/or work as teaching assistants, thus giving Ph.D. graduates experience for an academic teaching career.

One of the major checkpoints in the Ph.D. program that assesses the breadth and depth of the student knowledge is the written and oral comprehensive examination (proposal defense). The comprehensive examination tests the breadth and depth of knowledge in all aspects of computer science and engineering.

The Ph.D. student is expected to work on an approved dissertation topic and come up with original results. The student has to report the results in the form of a Ph.D. dissertation. The student is encouraged to publish these results as they are discovered in international professional literature.

Concentration Areas

Computation, Intelligence and Robotics
- CS 504 Artificial Intelligence
- CS 509 Automata Theory
- CS 520 Advanced Robotics
- CS 555 Multimedia Bases
- CS 580 Intro. to Neural Networks
- CS 584 Machine Perception

Languages and Systems
- CS 502 Analysis of Algorithms
- CS 503 Operating Systems
- CS 551 Advanced Databases
- CS 555 Web-Based Application Development

Parallel Processing and Networking
- CpE 481 Mobile Communications
- CpE 482 Network Administration
- CpE 561 Network Security
- CS 590 Parallel and Distributed Processing

Computer Architecture and VLSI
- CpE 548 Low Power VLSI Circuit Design
- CpE 550 Advanced VLSI Design
- CpE 596 Digital Signal Processing Laboratory
- EE 550 VLSI: Digital System Design