**Computer SCIENCE and engineering program**

**Doctor of Philosophy (Ph.D.) Degree**

**DEGREE INFORMATION**

**Program Admission Deadlines:**

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**Fall:** February 15

**Spring:**  October 15

**Summer:**  No admit

**International Deadlines:**

 **Fall:** January 15

 **Spring:** September 15

**Summer:**  no admit

**Minimum Total Hours:** 72 post-bachelor’s

 **42 post-**master’s

**Program Level:** Doctoral

**CIP Code:** 14.0901

**Dept. Code:** ESB

**Program (Major/College):** CSE EN

**Approved:** 1984

**CONTACT INFORMATION**

**College:** Engineering

**Department:** Computer Science and Engineering

**Contact Information:** [www.grad.usf.edu](http://www.grad.usf.edu/)

**PROGRAM INFORMATION**

The degree of Doctor of Philosophy is conferred in recognition of a candidate’s highest level of scholarly competence and demonstrated capability to independently conduct and report significant research in computer science and engineering. This achievement requires more than an accumulation of course credits over a stated period of residence. Scholarly competence is achieved through systematic study and investigation in the chosen discipline at an advanced level. The major professor and at least two committee members will be from the Computer Science and Engineering department. Research capability is developed during the course of study and is achieved through the completion of significant and independent research. The results of this research must be formally presented in a written dissertation and successfully defended before an examining committee. The dissertation must demonstrate the significance of the research as well as the candidate’s ability to organize and present her/his results in a professional manner.

**Accreditation:**

Accredited by the Commission on Colleges of the Southern Association of College and Schools.

**Major Research Areas:**

An excellent selection of courses and laboratories support graduate studies in algorithms, artificial intelligence, machine learning, data mining, computer architecture, graphics, networks, computer vision, distributed systems, embedded systems, expert systems, formal verification, image processing, pattern recognition, robotics, databases, software engineering, computer security, compilers, programming languages, VLSI design, and CAD.

**ADMISSION INFORMATION**

Must meet University requirements (see Graduate Admissions) as well as requirements listed below.

**Program Admission Requirements**

* The GRE is required for all Ph.D. applicants. The median GRE scores of recently admitted students include 770 on the Quantitative portion and a Verbal Total of 450. For GRE tests taken after August 1, we require a minimum of 161 on the Quantitative portion (81 percentile) and a minimum of 150 (44 percentile) on the Verbal.
* Minimum grade point average (GPA) of B average (or equivalent) for all coursework completed during the last two years of undergraduate program.
* Submission of TOEFL scores with an Internet-based score of 79 or higher for applicants from non-English speaking countries. If consideration of an assistantship is desired, the speaking score component of the TOEFL must be 26 or above
* The TOEFL requirements may be waived if the applicant meets one of the following conditions:
	+ Has scored 500 or higher on the GRE Verbal Test, (Old Scores) or 153 with the New GRE scoring.
	+ Has earned a college degree at a U.S. institution of higher learning.
	+ Has earned a college degree from an institution whose language of instruction is English, (must be noted on the transcript).
	+ Has scored 6.5 on International English Language Testing System, (IELTS).
* Three letters of recommendation
* Statement of purpose
* The applicant must also have mathematical preparation equivalent to that obtained from courses in Calculus through Differential Equations; knowledge of computer science and computer engineering, including logic design, computer architecture, data structures, operating systems, and analysis of algorithms. Students are assumed to have good programming skills. The majority of students accepted to the program possess an undergraduate degree in Computer Science, Computer Engineering, Electrical Engineering, or Mathematics; however, students who hold an undergraduate degree in a related field are encouraged to apply.

**DEGREE PROGRAM REQUIREMENTS**

**Total Program hours: 72 minimum (post-bachelor’s)**

 **42 minimum (post-master’s)**

A minimum of 72 semester hours including dissertation hours beyond the baccalaureate degree are required of all Ph.D. students

**Post-Bachelor’s: 72 hours minimum**

Core – 9 credit hours

Coursework – 24 credit hours

Independent Study/Dir Research – Up to 15 hours

Dissertation – At least 20 credit hours

**Post-Master's: 42 hours minimum**

Core – 9 credit hours

Independent Study/Dir Research – Up to 15 hours

Dissertation – At least 20 credit hours

**Core Requirements – 9 credit hours**

COP 6611 Operating Systems 3

EEL 6764 Principles of Computer Architecture 3

COT 6405 Introduction to the Theory of Algorithms 3

**Coursework – 33 credit hours**

At least 33 credit hours in coursework excluding independent study and directed research. The exact distribution of these hours in the Computer Science and Engineering discipline will be determined by the student and the supervisory committee to provide the student with a stimulating educational experience.

**Departmental Course Options (examples)**

CAP 5400 3 Digital Image Processing

CAP 5625 3 Introduction to Artificial Intelligence

CAP 5771 3 Data Mining

CAP 6415 3 Computer Vision

CAP 6455 3 Advanced Robotic Systems

CAP 6615 3 Neural Networks

CAP 6736 3 Geometric Modeling

CDA 5416 3 Computer System Verification

CNT 6215 3 Computer Networks

COP 6621 3 Programming Languages and Translation

EEL 5771 3 Introduction to Computer Graphics I

EEL 6706 3 Testing and Fault Tolerance in Digital Systems

CIS 6900 1-19 Independent Study

CIS 6930 1-5 Special Topics

CIS 6940 1-4 Graduate Instruction Methods

CIS 6946 0-3 Internships/Practicums/Clinical Practice

CIS 6971 2-19 Thesis: Master’s

**Independent Study/Directed Research – 1-15 credit hours**

Up to 15 credit hours of independent study/directed research.

CIS 6900 1-15 Independent Study

CIS 7910 1-15 Directed Research

**Qualifying Examination**

 The qualifying examination is a two-step process. First, students must get a GPA of 3.60 or better in these three courses within one year of enrollment, otherwise they will have to re-take only the necessary course(s) and get a GPA of 3.60 or better using the best three grades If a student does not meet these requirements by the end of the second year, he or she will be withdrawn from the Ph.D. program. Second, students must take the qualifying exam and pass it. Students are required to take the exam as soon as they meet the requirements of the first step.

**Major Research-Area Paper and Future Research Directions**

To fulfil this milestone, students are required to write a survey or research paper on his/her area of research as the lead author. A journal or conference paper already published will count towards this requirement. The student is then required to give an oral presentation on the subject to his/her major professor and a doctoral evaluating committee. The oral presentation must also contain a section on future research directions, a draft plan of research activities towards graduation. The presentation will be open to the public. The paper and presentation is to be completed within one year of passing the Qualifying Examinations and will have to be formally approved by his/her major professor the doctoral evaluating committee before applying for Candidacy.

 and the Major Research Area Paper and Future Research Directions presentation,

The student’s progress in the program is monitored by a supervisory doctoral committee, which is usually appointed at an early stage in the student’s program. This committee consists of at least five members, one of whom is outside the College of Engineering. The Major Professor will be a member of the Computer Science and Engineering Department. Normally, two more Computer Science and Engineering faculty serve on the committee with a member in another department in the college.

The student must conduct research of sufficient quality that demonstrates an independent and original contribution to the field of computer science and engineering. Students must take at least 20 semester hours of doctoral dissertation credits;the exact number of credits is determined by the candidate’s supervisory committee. It is strongly recommended that doctoral students submit journal articles for publication relevant to dissertation research.

**Dissertation hours - At least 20 credit hours**

CIS 7980 2-19 Dissertation

Student are required to take at least 20 hours of dissertation hours until they accumulate a minimum number of 72 hours in the program.

**Dissertation Defense**

A doctoral candidate must defend her/his research before her/his committee. The defense is usually open to the university community and conducted in accordance with the university’s general rules and regulations. The defense involves a formal presentation of the dissertation followed by a critical exchange between the candidate and the committee. The committee chairman moderates the proceedings and determines procedure, originality of the research, and contributions made by the candidate.

**COURSES**

See [http://ugs.usf.edu/course-inventory](http://www.ugs.usf.edu/sab/sabs.cfm)