Graduate Student HANDBOOK

Department of Computer and Information Science and Engineering

Academic Year 2015-2016

UF UNIVERSITY of FLORIDA

Graduate Student Handbook

Computer and Information Science and Engineering Department

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DEPARTMENT MISSION

The Department of Computer and Information Science and Engineering is concerned with the theory, design, development and application of computer systems and information processing techniques. The mission of the CISE Department is to educate undergraduate and graduate majors as well as the broader campus community in the fundamental concepts of the computing discipline, to create and disseminate computing knowledge and technology, and to use our expertise in computing to help society solve problems.

INTRODUCTION

The graduate programs of the Computer and Information Science and Engineering Department at the University of Florida include the Master of Science (M.S.), Master of Engineering (M.E.), and Doctor of Philosophy (Ph.D.) degrees. This handbook details the policies and regulations governing these degrees and should be used in conjunction with the University of Florida *Graduate Catalog* http://graduateschool.ufl.edu/academics/graduate-catalog and the Graduate Student Handbook from the Graduate School website (http://graduateschool.ufl.edu/files/handbook.pdf). It is the responsibility of the student to be familiar with all these publications and to adhere to the stated rules and policies.

General Degree Requirements

For the Master's degree, a minimum of 30 credit hours is required; for the Ph.D. degree, a minimum of 90 credit hours is required beyond the bachelor's degree.

Master's students may transfer a maximum of 9 graduate credit hours taken from an outside institution approved by UF; Doctoral students may transfer up to 30 credit hours from a Master's degree in computer science/engineering taken at an outside institution approved by UF. . In addition, up to 15 additional credits beyond the master level taken from an outside institution can be transferred with approval.

The Master of Engineering (M.E.) degree may be awarded only to those students who have a prior B.S. degree in computer science/engineering from an ABET-accredited program. The Master of Science (M.S.) degree may be awarded to students with an undergraduate degree in any appropriate area of science or engineering.

All work counted toward a Master's degree must be completed during the seven years immediately preceding the date on which the degree is to be awarded.

To graduate from any of the above-mentioned degree programs, a 3.00 GPA is required in both the overall (UF) and in the CISE (departmental major) categories.

No graduate credit is allowed for computer and information science and engineering courses below the 5000 level. Graduate students may take additional undergraduate courses, but credits earned in these courses are not counted toward the minimum degree requirements. A summary of the pertinent degree requirements is shown in the appendix. The detailed requirements of the graduate degree programs are described in the following sections.

MASTER'S PROGRAMS

Master's Degrees Overview

The CISE Department offers the Master of Science degree through the College of Engineering:

- M.S. in Computer Engineering
- M.S. in Computer Science
- M.E. in Computer Engineering
- M.S. in Digital Arts and Sciences

The College of Liberal Arts & Sciences:

- M.S. in Computer Science

The CISE department also offers Master's degrees via distance learning through the UF EDGE program.

- EDGE program home: http://www.ufedge.ufl.edu
- CISE department EDGE brochure: www.ufedge.ufl.edu/docs/brochures/brochure-computer_information_science_engineering_degree_summary.pdf

Master's of Science General Requirements

Master's students may choose between the thesis and the non-thesis options. The total credit hours required for either of the two options is 30. Up to 9 credits earned from another accredited institution may be transferred and must be applied during the first term of enrollment . For the thesis option, 6 credits of CIS6971 are required and counted towards the 30-credit requirement (must be registered for CIS6971 in the term of graduation). The student should choose one option when the supervisory committee is formed, and any subsequent change in option is subject to approval by the supervisory committee. The Graduate School requires that any change in option be completed at least one full semester prior to the intended date of graduation. (Note that once a student has taken the master's examination or has attempted a thesis defense, the option cannot be changed.)

A student seeking a Master's degree in the College of Engineering may become a candidate for the Master of Engineering degree, provided the student has a bachelor's degree in engineering from an ABET-accredited program. Students who do not meet this requirement will be candidates for the Master of Science degree.

Master's of Science Supervision

If the thesis option is chosen, the student must form a supervisory committee no later than the end of the second semester of enrollment. The committee chair person henceforth becomes the student's advisor. The student should consult the advisor for advice in creating and pursuing a plan of study. The supervisory committee must consist of three graduate faculty members; at least two (including the chair) must be from the CISE Department.

Master's of Science Course and GPA Requirements

All Master's students are required to take the following core courses. Transferring any core course must be approved by the Graduate Affairs Committee.

According to the Graduate School policy, students must maintain a 3.0 overall GPA, as well as a cumulative 3.0 GPA for all courses taken from CISE, to graduate. In addition, the CISE core course requirements are such that each student may have at most only one core course with a grade below "B" ("B-", "C+", or “C”)

Master's Degree Programs

Master of Science in Computer Science through the College of Engineering

For the Computer Science Master' s degree please refer to:
https://www.cise.ufl.edu/grad/mscomputersciencethroughcollegeofengineering/

- **Required Core Courses**
  - COT 5405 Analysis of Algorithms
  - COP 5555 Programming Language Principles
- **Select two from the following four courses:**
  - CDA 5155 Computer Architecture Principles
  - COP 5615 Distributed Operating System Principles
  - CNT 5106C Computer Networks
  - COP 5536 Advanced Data Structures

Course and Credit Requirement for the Non-Thesis Option:

- 12 CISE graduate core credits.
- 18 other CISE graduate-level credits.
  - Minimum of 12 credits MUST be taken from CISE graduate-level courses.
  - Up to 1 credit of CIS 6935 (Graduate Seminar) allowed.
  - Up to 3 credits of CIS 6905 (Individual Study) allowed.
  - EXCLUDES CIS 6910, CIS 6940.
  - Maximum 6 credits outside the department MAY be taken with approval from the Graduate Affairs Committee.
  - Up to 3 credits of EGN 5949 (internship) allowed.

Course and Credit Requirement for Thesis Option:

- 12 CISE Graduate core credits
- 6 Master thesis research credits (CIS 6971)
- 12 other CISE graduate-level credits:
  - Minimum of 6 credits MUST be taken from CISE graduate-level courses.
  - Up to 1 credit of CIS 6935 (Graduate Seminar) allowed.
  - Up to 3 credits of CIS 6905 (Individual Study) allowed.
  - EXCLUDES CIS 6910, CIS 6940.
  - Maximum 6 credits outside the department MAY be taken with approval from the Graduate Affairs Committee.
  - Up to 3 credits of EGN 5949 (Internship) allowed

Master of Science in Computer Engineering through the College of Engineering

For the Computer Engineering Masters please refer to:
https://www.cise.ufl.edu/grad/mscomputerengineering

- **Required Core Courses**
  - CDA 5155 Computer Architecture Principles
  - COT 5405 Analysis of Algorithms

- **Select two from the following three courses:**
  - COP 5615 Distributed Operating System Principles
  - CNT 5106C Computer Networks
  - CDA 5636 Embedded Systems

Course and credit requirement for non-thesis option:

- 12 CISE graduate core credits
- 18 other CISE graduate-level credits:
  - Minimum of 9 credits MUST be taken from CISE graduate-level courses.
  - Up to 1 credit of CIS 6935 (Graduate Seminar) allowed.
  - Up to 3 credits of CIS 6905 (Individual Study) allowed.
  - EXCLUDES CIS 6910, CIS 6940.
  - Maximum 9 credits Electrical and Computer Engineering or other courses outside the department may be taken with approval from the Graduate Affairs Committee.
  - Up to 3 credits of EGN 5949 (internship) allowed.

Course and credit requirement for thesis option:

- 12 other CISE graduate core credits:
- 6 master research credits (CIS 6971)
  - Minimum of 6 credits MUST be taken from CISE graduate-level courses.
  - Up to 1 credit of CIS 6935 (Graduate Seminar) allowed.
  - Up to 3 credits of CIS 6905 (Individual Study) allowed.
  - EXCLUDES CIS 6910, CIS 6940
  - Maximum 9 credits Electrical and Computer Engineering or other courses outside the department may be taken with approval from the Graduate Affairs Committee.
  - Up to 3 credits of EGN 5949 (internship) allowed.

Master of Science in Digital Arts and Sciences through the College of Engineering

For the Digital Arts and Science Concentration please refer to:
https://www.cise.ufl.edu/grad/msdas

- **Required core courses (6 credits):**
  - CAP5705 Computer Graphics
  - CAP5805 Computer Simulation

- **Additional core option courses (12 credits):**
  - CAP5416 Computer Vision
  - CAP5635 Artificial Intelligence
  - CAP6701 Advanced Computer Graphics
  - CAP6402 Aesthetic Computing
  - 5000- or 6000-level DAS-oriented course approved by Advisor
  - Up to 3 credits of CIS6905
  - Exclude CIS6910

- **Course and Credit Requirement for Thesis Option:**
  - 18 CISE graduate core credits (see above)
  - 6 master thesis credits (CIS6971)
  - 6 additional 5000- or 6000-level credits (may include a maximum of 3 credits CIS6905).

- **Course and Credit Requirement for *Project in Lieu of Thesis* Option:**
  - 18 CISE graduate core credits (see above)
  - 6 Project/Performance credits (CIS6971)
  - 6 additional credits: (the same as the 6 additional credits in Thesis option.)

Master of Engineering in Computer Engineering through the College of Engineering

For the Master of Engineering Computer Engineering Master's degree please refer to: https://www.cise.ufl.edu/grad/mecomputerengineering

- **Required core courses**:
  - COT 5405 Analysis of Algorithms
- **Select 3 of the 5 Courses Listed:**
  - CDA 5155 Computer Architecture Principles
  - COP 5555 Programming Language Principles
  - COP 5615 Distributed Operating System Principles
  - CNT 5106C Computer Networks
  - COP 5536 Advanced Data Structures

Course and Credit Requirement for Non-Thesis Option:

- 12 CISE graduate core credits.
- 18 other CISE graduate-level credits:
  - Minimum of 12 credits MUST be taken from CISE graduate-level courses.
  - Up to 1 credit of CIS 6935 (Graduate Seminar) allowed.
  - Up to 3 credits of CIS 6905 (Individual Study) allowed.
  - EXCLUDES CIS 6910, CIS 6940.
  - Maximum 6 credits outside the department MAY be taken with approval from the Graduate Affairs Committee.
  - Up to 3 credits of EGN 5949 (internship) allowed

Course and Credit Requirement for Thesis Option:

- 12 CISE graduate core credits.
- 6 master thesis research credits (CIS 6971)
- 12 other CISE graduate-level credits:
  - Minimum of 6 credits MUST be taken from CISE graduate-level courses.
  - Up to 1 credit of CIS 6935 (Graduate Seminar) allowed.
  - Up to 3 credits of CIS 6905 (Individual Study) allowed.
  - EXCLUDES CIS 6910, CIS 6940.
  - Maximum 6 credits outside the department MAY be taken with approval from the Graduate Affairs Committee.
  - Up to 3 credits of EGN 5949 (internship) allowed.

Master of Science in Computer Science - College of Liberal Arts and Sciences

For the Computer Science Masters please refer to:
https://www.cise.ufl.edu/grad/ms-computer-science-clas

- **Required Core Courses:**
  - COT 5405 Analysis of Algorithms
- **Two from the following five courses**
  - COT 5616 Mathematics for Intelligent Systems
  - COT 6315 Formal Languages and Computation Theory
  - CNT 5106C Computer Networks
  - COP 5536 Advanced Data Structures
  - COP 5555 Programming Language Principles

Course and Credit Requirement for Non-Thesis Option:

- 9 CISE graduate core credits.
- 21 other CISE graduate-level credits:
  - Minimum of 9 credits must be taken from CISE graduate-level courses.
  - Up to 1 credit of CIS 6935 (Graduate Seminar) allowed.
  - Up to 3 credits of CIS 6905 (Individual Study) allowed.
  - EXCLUDES CIS 6910, CIS 6940.
  - Minimum of 9 credits outside the department.
    - At least 3 of these credits must be offered through the College of Liberal Arts and Sciences.
  - Up to 3 credits of EGN 5949 (internship) allowed.
  - The student's program must form a coherent specialization which must be approved by the CISE Graduate Affairs Committee

Course and Credit Requirement for Thesis Option:

- 9 CISE graduate core credits.
- 6 master thesis research credits (CIS 6971)
- Minimum of 15 credits other graduate-level credits:
  - Minimum of 6 credits MUST be taken from CISE graduate-level courses.
  - Up to 1 credit of CIS 6935 (Graduate Seminar) allowed.
  - Up to 3 credits of CIS 6905 (Individual Study) allowed.
  - EXCLUDES CIS 6910, CIS 6940.
  - Minimum 6 credits outside the department
    - At least 3 of these credits must be offered by the College of Liberal Arts and Sciences.
  - Up to 3 credits of EGN 5949 (internship) allowed.
  - The student's program must form a coherent specialization which must be approved by the CISE Graduate Affairs Committee.

Establishing Equivalencies for Core Courses

A procedure has been put in place to determine core course equivalencies. If you believe that you have taken a course, including undergraduate level, that you believe is equivalent to a core course in our department, you will need to take the following steps:

- Obtain a copy of your complete finalized transcript from your prior institution.
- Prepare a copy of the course syllabus and catalog description of the equivalent course as well as any supporting material such as exams, projects, and homework.
- Bring these items to the instructor who teaches the core courses for determining whether the course can be waived. The instructor's final decision should be emailed to grad advising; this printed equivalency decision will be added to the student's file

This is a different process than transferring your degree or any other courses toward your degree, which must be done with a grad adviser during the third and fourth weeks of classes in the student's first semester.

Master's Examination

All Master's students are required to pass an examination within six months prior to graduation. Students must be appropriately registered in their final term: 3-credit hours for Fall and Spring semesters and 2-credit hours for Summer semesters. Students with the thesis option must register for 3 credits of CIS6971, Master's Research, in the final term. A graduation workshop is held every semester for graduating students to review the graduation requirements.

Students with the thesis option are examined primarily on their thesis topic. The scope of the thesis will be determined by the student's supervisory committee. Each student must request that the oral examination be scheduled in concurrence with the Supervisory Committee Chair. The examination announcement must be posted by the Student Services Center a minimum two weeks prior to the examination. Committee members must be provided a copy of the thesis one week prior to the examination.

Non-thesis option students are given a brief written examination after they have satisfied all course and grade requirements. The exam requires no advance general computer science engineering knowledge and may be administered in conjunction with the Exit Interview. Questions regarding the exam and/or Exit Interview should be directed to a graduate adviser.

Applying to Enter the Ph.D. Program for CISE Master's Student

CISE Master's students may apply to enter the Ph.D. program after two semesters' grades become available. A statement of purpose and three reference letters from CISE graduate faculty (the supervisory committee chair should be included for M.S. with thesis option) are required. The student's graduate record will be reviewed and evaluated before being considered for entry into the Ph.D. program.

All Master's-to-Ph.D. decisions will be made in the early spring for the fall semester entry date. All materials should be submitted to the grad admissions officer at the Student Services Center before February 1st .

Progress toward Master’s Degree

All requirements for the Master’s degree shall be completed within seven years after enrollment. Full-time students are expected to finish their requirements in three years. If a student fails to do this, a decision will be made by the Graduate Affairs Committee as to whether the student should continue in the program. The decision is based on recommendation by the student's advisor as well as on each student's progress towards the completion of the master's degree.

Checklist for Master’s Degree

	When	To Do
	First Semester	If appropriate, transfer up to 9 credit hours from graduate courses taken previously to your UF master’s program.
	Second Semester	Form supervisory committee (if pursuing thesis option) before the end of the semester.
	Semester before graduation	Check with Student Services to verify all graduation requirements will be satisfied. If thesis, discuss your plan of graduation with your supervisory committee chair.
		If you have grades less than C (i.e., C-, D, I, E, N grades), discuss options for meeting graduation requirements
	Semester of graduation	Submit degree application online via ISIS.
		Complete departmental exit interview process (watch for applicable email message).
		Be registered for at least the minimum number of credits required for completion of non-thesis degree or completion of thesis degree.
		FOR THESIS DEFENSE: ■ schedule thesis defense with supervisory committee. ■ inform Student Services of scheduled plans and reserve a room for the defense. ■ at least a week before the defense, provide each member of the supervisory committee an advance copy of your thesis. ■ ask your supervisory chair to pick up your file at Student Services on the day of your defense. ■ after defending, verify with your supervisory chair that all final exam forms have been correctly signed. ■ submit all thesis forms and copies to the Graduate School by published deadlines

Master’s Minor

To obtain a Master’s minor, a non-CISE student musts complete one systems area graduate core course, one theory area graduate core course, and one elective graduate course, each with a grade of B or better. In addition, the student must select a CISE graduate faculty member to serve as a minor representative on the Master’s committee of the major department.

- **SYSTEM CORE COURSES**:
  - CDA5155 Computer Architecture Principles
  - CNT5106c Computer Networks
  - COP5555 Programming Language Principles
  - COP5615 Distributed Operating System Principles

- **THEORY CORE COURSES:**
  - COP5536 Advanced Data Structures
  - COT5405 Analysis of Algorithms
  - COT6315 Formal Languages and Computation Theory

DOCTOR OF PHILOSOPHY PROGRAM

Ph.D. General Requirements – (See Appendix, Table 1)

To earn a Ph.D. degree, a student must satisfy a minimum of 90 graduate-level credits beyond the bachelor's degree. Up to 30 credits from a prior master's degree in Computer Science or Computer Engineering taken either at the University of Florida or from another accredited institution may be transferred and counted towards the Ph.D. degree. Students must apply for the credit transfer during their first term of enrollment. An approval from the graduate school is necessary for the credit transfer. Up to an additional 15 credits beyond the first 30 credits may be counted toward the Ph.D. degree, students must complete 30 credits while enrolled at the University of Florida campus. Additionally, students must satisfy the following requirements before earning the degree:

- Satisfy the CISE graduate-level course and GPA requirements.
- Pass the written and oral qualifying examinations.
- Pass the admission to candidacy examination (defend a dissertation proposal).
- Satisfy the minimum number of seminar credits.
- Serve as a Teaching TA for at least one semester.
- Write and defend a Ph.D. dissertation.

Ph.D. Supervision

The student must form a supervisory committee no later than the end of the second semester of enrollment. The supervisory committee consists of at least five Graduate Faculty members, all with Graduate Faculty Status (GFS). At least three members of the committee (including the chair) must have GFS status in the CISE Department and at least one must be from outside CISE (external member).

An annual evaluation of the research progress/potential of each Ph.D. student will be performed by the Graduate Affairs Committee in conjunction with the chair of the student's supervisory committee. This evaluation will be done at the end of Spring semester. Copies of this evaluation and of the student comments are placed in the student's academic file. The student and the supervisory committee chair receive notice after the student has been in the CISE graduate program for 5 years without advancing to candidacy. Proper actions and close monitoring will take place afterwards to insure that students are making progress towards the Ph.D. degree.

Ph.D. Course and GPA Requirements

To successfully complete a Ph.D. degree, students must satisfy the following course and GPA requirements.

Core course requirements: Students who have completed a Master's degree in Computer Science or Computer Engineering from another university may petition to have courses taken during their Master's degree count towards the Ph.D. core course requirement. Such petitions will be accepted only after the Graduate Affairs Committee has determined that the outside course is similar in rigor and in scope to the equivalent course offered by the CISE Department.

- Computer Systems: Select 2 from the following 4 courses
    - CDA5155 Computer Architecture Principles
    - COP5555 Programming Language Principles
    - COP5615 Distributed Operating System Principles
    - CN 5106C Computer Networks
- Theory: Select 2 from the following 3 courses
    - COT5405 Analysis of Algorithms
    - COP5536 Advanced Data Structures
    - COT6315 Formal Languages and Computation Theory

Other course requirements:

- For students without a prior master's degree in Computer Science or Computer Engineering, see Appendix, Table II).
    - 24-credits of CISE graduate-level courses, exclude CIS6905, 6910, 7979, 7980, 6971, or 6935 may account for 3 credits for thesis-option CISE Master's.
    - A minimum of 3-credits of CIS7980 Research for Doctoral Dissertation.
    - Other graduate-level courses including any research credits are at the discretion of the student and the students' supervisory committee chair.
- For students with a prior master's degree in Computer Science or Computer Engineering, see, Appendix, Table II).
    - 6-credits of CISE graduate-level courses, exclude CIS 6905, 6910, 7979, 7980, 6971 may account for 3 credits for thesis-option CISE Master's. Note that the required CISE graduate-level credits increases accordingly to compensate any waived core course credits.

- A minimum of 3-credits of CIS7980 Research for Doctoral Dissertation.

- Other graduate-level courses including any research credits are at the discretion of the student and the students' supervisory committee chair.

GPA requirement:

- According to the Graduate School policy, students must maintain a 3.0 overall GPA, as well as a cumulative 3.0 GPA for all courses taken from CISE. In addition, the CISE core course requirements are such that each student can have at most one core course with a grade below "B" ("B-", "C+", or "C").

- Ph.D. students are expected to maintain a 3.5 GPA to be considered in "good standing".

Establishing Equivalencies for Core Courses

A procedure has been put in place to determine core course equivalencies. If you have taken a course, including undergraduate level, that you believe is equivalent to a core course in our department, you will need to take the following steps:

- Obtain a copy of your complete finalized transcript from your prior institution.
- Prepare a copy of the course syllabus and catalog description of the equivalent course as well as any supporting material such as exams, projects, and homework.
- New Ph.D. students must submit the collected information to a grad adviser at Student Services on the first day of classes. The admissions Committee will evaluate the equivalencies of core courses. Any core course that is waived will count toward the three core courses required to take the written qualifying exam, and will be counted as a B+ (a neutral grade) in the required 3.4 core GPA for taking the Ph.D. written qualifying exam. A printed note summarizing the Committee's decision will be added to the student's file.

This is a different process than transferring a degree or any other courses toward your degree, which must be done with a grad adviser during the third and fourth weeks of classes in the student's first semester.

Seminar Requirement for Ph.D. Students

Full-time, on-campus Ph.D. students must successfully complete 3 credits of CIS6935 (Graduate Seminar) before graduation. The course awards one credit on an S/U basis and may be taken only once each semester. Off-campus Ph.D. students (through distance learning) are exempt from the seminar requirement.

Ph.D. students are not expected to register for the seminar course in their first two semesters, when most students take a full load of regular 3-credit courses. The 1-credit seminar course can accompany CIS7979 (Advanced Research) in later semesters, adjusting the total credits to satisfy the required semester credit load.

The instructor for this course will make all decisions in selecting eligible seminars and setting the minimum number of attendances which will constitute a satisfactory grade. All Barr Systems seminars, department colloquium talks, and Ph.D. dissertation defenses are qualified. Other talks may also be included based on recommendations from faculty. See the CISE colloquia schedule and Barr Systems lecture schedule links on the CISE Department Seminar page.

Ph.D. Qualifying Examination

The Ph.D. Qualifying Examination consists of a written portion. Students must pass two different area examinations to pass the written portion. Please refer to https://www.cise.ufl.edu/academics/grad/phd for links to the syllabus for each area.

The written area examinations may be selected from the following areas:

Algorithms and Theory	Computer Vision
Databases	Graphics and Modeling
Information Security	Machine Learning
Networking	Systems

A faculty member is assigned as the Area Representative for handling the examination for each exam area. The exam committee Chair and the current Area Representatives are listed from on a link on the website. A syllabus is published in advance of the exams listing the topics to be covered in each exam.

The Ph.D. written examination is offered twice a year, typically in late October during Fall semester, and in mid-March during Spring semester. Students must register for area exams in the beginning of the semester that they will attempt the exams. To maintain the level of CS/CE core knowledge, Ph.D. students are required to obtain at least a 3.4 GPA in 3 of the required 4 core courses that will be counted towards satisfying the core requirement before they are allowed to take the written portion of the qualifying exam. Additionally, the three core courses must include either 1 systems and 2 theory OR 2 systems and 1 theory—see Core course requirements. Approved equivalent core courses are counted towards the minimum 3 core courses with 3.4 GPA in calculating the minimum GPA requirement.

The total number of attempts to pass the two different area examinations cannot exceed four and students must complete all attempts by the end of the fifth semester in the CISE graduate program, or the second semester after entering the CISE Ph.D. program with a prior M.S. degree from this department, whichever comes last. If a student fails an exam in one area, that student may choose to attempt an exam in a different area.

A Ph.D. student who has a Master's degree from the CISE department and who has left the CISE graduate program for at least one year before entering the Ph.D. program must pass the written exam by the end of the fifth semester, counted from the semester that the student began the Ph.D. program in CISE.

Distance-learning Ph.D. students must follow the same timeline to pass the qualifying exam. Exceptions must be approved by petition to the Graduate Affairs Committee.

Once the written examination is passed, the student is allowed to take the oral examination, which is instituted by the student's supervisory committee. The oral examination is normally taken in conjunction with the Ph.D. admission to candidacy. Students who fail to pass the oral examination are given a maximum of one retake.

The Graduate School requires that at least two semesters elapse between passing the oral portion of the Qualifying Examination and receiving the Ph.D. degree. If the Qualifying Examination is passed before the midpoint of the semester, then that semester counts as a full semester.

Previous Ph.D. Qualifying Examinations may be accessed from the cise.ufl.edu domain at cise.ufl.edu/academics/grad/phd/oldexam

Admission to Candidacy

A student may apply for advancement to Ph.D. candidacy by scheduling an oral examination after the having passed the Qualifying Examination. The decision to advance a student to Ph.D. candidacy is made by the student's Supervisory Committee. This decision is based on the following:

- Performance in coursework
- The opinion of the Supervisory Committee concerning the overall fitness for candidacy
- An approved Ph.D. dissertation topic

The purpose of the Ph.D. Candidacy Examination is to certify the scope and validity of the student's proposed research, and the student's ability to perform the work. A document including a concise introduction to the area of research, relevant work by others, preliminary results by the student, an outline of proposed work, and a bibliography must be submitted to the committee at least two weeks prior to the examination. The student will receive a grade of pass or fail. A failing mark will require another examination when the student is better prepared, at least one semester after the first attempt. A passing mark will often be accompanied by useful comments (to be made in writing by the student's committee chairman) so the student can better refine future efforts and goals.

After passing the Ph.D. Candidacy Examination, the student is admitted to candidacy. The student may register for Research for Doctoral Dissertation (CIS7980) only after admission to candidacy. Prior to passing the Ph.D. Candidacy Examination, research must be conducted under the Advanced Research course (CIS7979).

Ph.D. Students Earning a Master's Degree

Ph.D. students may apply for a Master's degree after advancing to Ph.D. candidacy assuming completion of all Master's degree requirements and continued pursuit of the Ph.D. degree in the CISE Department.

Annual Evaluation and Termination of Ph.D. Students

All Ph.D. students must make satisfactory progress towards the Ph.D. degree. This includes maintaining a good GPA, passing the Ph.D. qualifying exam within the allowable time limit, advancing to candidacy, and defending the Ph.D. thesis promptly. Ph.D. students are evaluated annually by the Graduate Affairs Committee in conjunction with students' Supervisory Committees. The completed evaluation is sent to the student and the Supervisory Committee chair. Students who repeatedly fail to make satisfactory progress may be terminated from the Ph.D. program. Students already having advanced to Ph.D. candidacy status may be terminated by a vote of the faculty. Such a decision will also be based on the student's annual evaluations, and a recommendation of the student's Supervisory Committee.

Communication Skills

The Graduate School requires all Ph.D. candidates to be able to use the English language correctly and effectively. All Ph.D. students must be appointed as a Teaching TA for at least one semester. This requirement directly addresses the need for candidates to demonstrate oral and written communication skills. After passing the Ph.D. written qualifying exam, students who have not served as a Teaching TA must serve as Teaching TA in the following semester. With approval from the Graduate Affairs Committee, students can defer the Teaching TA service for one semester. The Teaching TA requirement emphasizes verbal communication skills. Students deficient in these skills may be required to take appropriate remedial course work, which will not

count toward the required credit hours. Off-campus Ph.D. students (through distance learning) are exempt from the teaching TA requirement.

Ph.D. Final Examination

All Ph.D. students are required to complete and defend a dissertation of publishable quality. This must be an independent investigation, including a basic research component, which constitutes an original contribution to the engineering aspects of Computer and Information Science and Engineering. Projects that solely demonstrate an application of computer technology to a new problem area will not be acceptable. The format of the dissertation must conform to the requirements of the Graduate School. To facilitate this, the Graduate School Editorial Office provides the Guide for Preparing Theses and Dissertations and various seminars. The dissertation must be submitted to the Graduate School in electronic form.

The defense is the final examination in which the student defends his/her research. It must occur after the dissertation has been submitted to the Graduate School and all other prescribed work is done, but no more than six months before the conferring of the degree. The student must be registered for at least three hours of CIS7980 during the term in which the final examination is given and the term in which the degree is conferred (two hours in summer terms).

The dissertation title along with an abstract should be posted on electronic and standard bulletin boards at least two weeks in advance so that interested students and faculty may attend. A general-audience abstract must be submitted along with the announcement to the CISE Student Services Center for posting. The dissertation must be submitted to all Supervisory Committee members at least two weeks in advance of the defense.

The defense consists of two parts: an open part and a closed part. During the open part, the student gives a one hour presentation on the dissertation work. During this presentation, members of the audience may ask questions. Then the student's Supervisory Committee chairperson will ask the audience to leave the room to begin the closed section of the defense. The student's Supervisory Committee members and other faculty may ask the student more detailed questions during the closed section. The student will then leave the room while the Supervisory Committee prepares its decision. The defense may be attempted at most two times.

Time Limitation - All work for the doctorate must be completed within 5 years after the Qualifying Examination, or the examination must be repeated and passed.

Applying to Enter the Ph.D. Program for CISE Master's Students

CISE Master's students can apply to enter the Ph.D. program after two semesters' grades become available. A statement of purpose and three reference letters from CISE graduate faculty (the supervisory committee chair should be included for Master's with thesis option) are required. The student's graduate record will be reviewed and evaluated before being considered for entry into the Ph.D. program.

All Master's-to-Ph.D. decisions will be made in the early spring for the fall semester entry date. All materials should be submitted to the grad admissions officer at the Student Services Center before February 1st.

Ph.D. Minor

To obtain a Ph.D. minor, a non-CISE student must complete four graduate courses in the CISE department with a grade of B or better, pass one area qualifying exam, and have a CISE

graduate faculty member serve as a minor representative on the Ph.D. committee of the major department.

Checklist for Ph.D. Degree

When	To Do
First Semester	■ apply for credit transfer for up to 30 credits from a prior master's degree in computer science or computer engineering from an accredited institution. ■ apply for credit transfer for up to 15 credits beyond the master's degree earned from a computer science doctoral program at other accredited institutions. ■ apply for equivalency for any core course to satisfy the core course requirement.
Second Semester	Selected Supervisory Committee Chair and for the Supervisory Committee before the end of the semester.
Third and Fourth Semesters	■ prepare for an take the Ph.D. written Qualifying Exam. Students can take the first attempt after satisfying the core and GPA requirements. ■ register for grad seminar course (one credit for each of three semesters) ■ after passing the written portion of the qualifying exam, discuss with Supervisory Committee Chari and notify Student Services of when to serve the one-semester teaching-TA requirement
Semester for Admission to Candidacy	■ discuss with Supervisory Committee Chair the plan to take the candidacy exams; inform the committee and set up the oral exam date. ■ inform the Graduate Academic Adviser of the planned date of the exam ■ prepare the dissertation proposal and deliver to supervisory committee 2 weeks before the exam ■ after admittance to candidacy, apply for the master's degree (for those without a prior master's degree who have satisfied all master's requirements)
Semester before Graduation	■ discuss your plan for graduation with the Supervisory Committee Chair ■ check with the Graduate Academic Adviser to verify that all graduation requirements, including appropriate course credits, passing Qualifying Exam, admission to Candidacy, have been satisfied.

Semester of graduation	■ Submit degree application online via ISIS. ■ Complete departmental exit interview process (watch for applicable email message). ■ Be registered for at least the minimum number of credits required for completion degree. FOR DISSERTATION DEFENSE: ■ schedule dissertation defense with supervisory committee. ■ inform the Graduate Academic Adviser of scheduled plans and reserve a room for the defense. ■ at least a week before the defense, provide each member of the supervisory committee an advance copy of your dissertation. ■ ask your supervisory chair to pick up your file at Student Services on the day of your defense. ■ after defending, verify with your supervisory chair that all final exam forms have been correctly signed. ■ submit all dissertation forms/copies to the Graduate School by published deadlines

Graduate Course Descriptions

CAP 5100 Human-Computer Interaction (3)
Prereq: COP 3530, and any one programming course (CGS 2414, CGS 3460 or CGS 3464).
Topics related to interaction with technology, including interface design, software tools, 3-D interaction, virtual environments, interaction devices, collaboration, and visualization.

CAP 5416 Computer Vision (3)
Prereq: MAC 2312, CGN 3421 or C-language.
Introduction to image formation and analysis. Monocular imaging system projections, camera model calibration, and binocular imaging. Low-level vision techniques, segmentation and representation techniques, and high-level vision.

CAP 5510 Bioinformatics (3)
Prereq: COP 3504 or equivalent.
Basic concepts of molecular biology and computer science. Sequence comparison and assembly, physical mapping of DNA, phylogenetic trees, genome rearrangements, gene identification, biomolecular cryptology, and molecular structure prediction.

CAP 5515 Computational Molecular Biology (3)
Algorithms related to molecular biology. Sequence comparisons, pattern matching, pattern extraction, graph techniques in phylogeny construction, secondary structure prediction, multiple sequence alignment, contig search, DNA computing, computational learning theory, and genetic algorithms.

CAP 5635 Artificial Intelligence Concepts (3)
Prereq: COP 3530.
Heuristic search, game theory, knowledge representation, logic, machine learning, AI languages and tools. Applications such as planning, natural language understanding, expert systems, and computer vision.

CAP 5705 Computer Graphics (3)
Prereq: COP 3530.
Display device characteristics; system considerations, display algorithms. Curve and surface generation. Lighting models and image rendering.

CAP 5805 Computer Simulation Concepts (3)
Prereq: COP 3530.
Introduction to concepts in continuous and discrete simulation. Empasis on fundamental concepts and methodology, using practical examples from a wide variety of disciplines.

CAP 6402 Aesthetic Computing (3)
Prereq: COP 5705, CAP 5805.
Principles of artistically motivated, personalized representations of formal model structures in computing and mathematics.

CAP 6516 Medical Image Analysis (3)
Image formation, reconstruction mathematics (Fourier slice theorem, Abel, Hankel and Radon transforms), PDE-based denoising and segmentation, multidimensional clustering algorithms, iso-surface extraction, basic differential geometry of curves and surfaces, multidimensional splines, active 2D/3D models, image matching/registration with application to multimodal co-registration.

CAP 6610 Machine Learning (3)
Prereq: CAP 5635.
Review of attempts, within the artificial intelligence community, to construct computer programs that learn. Statistical pattern recognition with its applications to such areas as optical character recognition. Inductive learning, automated discovery.

CAP 6615 Neural Networks for Computing (3)
Prereq: CAP 5635.
Neural network models and algorithms. Adaptive behavior, associative learning, competitive dynamics and biological mechanisms. Applications include computer vision, cognitive information processing, control, and signal analysis.

CAP 6617 Advanced Machine Learning (3)
Prereq: CAP 6610.
Advanced concepts in developing computer programs that learn and improve with experience. Emphasis on methods based on probability, statistics, and optimization.

CAP 6685 Expert Systems (3)
Prereq: CAP 5635.
Production systems, meta-knowledge, heuristic discovery, indepth examination of several expert systems including TEIRESIAS, AM, DENDRAL, MYCIN, IRIS, CASNET, INTERNIST, BACON, PROSPECTOR.

CAP 6701 Advanced Computer Graphics (3)
Prereq: CAP 4730 or CAP 5705 or consent of instructor.
Curved surface representations, representation and visualization of higher-dimensional fields, advanced rendering, collision detection and collision response, and scene navigation in context of high-level graphics environments.

CDA 5155 Computer Architecture Principles (3)
Prereq: CDA 3101, COP 3530, and COP 4600.

Fundamental design issues of processor and computer architecture, a variety of design approaches for CPU, memory, and system structure.

CDA 5636 Embedded Systems (3)
Prereq: CDA 3101 and knowledge of programming and data structures.
Design and verification of low-cost, high-performance, low-power, and reliable embedded systems. The course covers all aspects related to embedded systems design including modeling, specification, exploration, estimation, optimization, synthesis, and verification of both software and hardware (analog as well as digital components) in embedded systems.

CDA 6156 High Performance Computer Architecture (3)
Prereq: CDA 5155, COP 5615.
Design and evaluation of instruction-level (superscalar, superpipeline) and task-level (fine and coarse-grained) parallel architecture. Language and operating system support for instruction and task scheduling and task synchronization.

CEN 5035 Software Engineering (3)
Prereq: COP 3504 and COT 3100.
Topics in projects organization, specification techniques, reliability measurement, documentation.

CEN 6070 Software Testing and Verification (3)
Prereq: CEN 5035.
Concepts, principles, and methods for software testing and verification. Topics include human and machine-based testing strategies, formal proofs of correctness, and software reliability.

CEN 6075 Software Specification (3)
Prereq: CEN 5035.
Concepts, principles, and methods for practical specification. System modeling, requirements exploration, validation and prototyping, and documentation techniques.

CIS 6905 Individual Study (1-3; max: 6)
Prereq: consent ing the study.
S/U option.

CIS 6910 Supe ax: 5)
Prereq: graduat
S/U.

CIS 6930 Spec 9)
Prereq: vary dep

Special Topics ar

- 3D Imaging & Visualization
- Advances Bioinformatics
- Adv LG Data Processing
- Algorithmic Econ
- Biometric Identification
- Cryptographic Anonymt
- Data Intensive Computing
- Digital Poetics
- Geom Graphics Physics
- GPU Arch & Programming
- Hi Perf & Data Inten
- Hum CTRD Comp Graphic
- Hyperspectral Imaging
- Interaction Design
- Intro CS Educ Research
- Intro Data Mining
- Malware Rev Eng
- Markov CHN Methods
- Markov CHN Montecarlo
- Mobile Networking
- Network Algorithms
- Penetration Testing
- Pen Test Ethical Hack
- Res Mthd Hum CTRD COM
- Social Network Computing
- Sound in Virtual Environment
- Spatial SP-Temp DB
- Translators
- User Experience Design

CIS 6935 Graduate Seminar (1)
Prereq: graduate status in CIS. Master's. students may take 1 time toward M.S. degree; Ph.D. students must take 3 times toward Ph.D. degree.
Presentations by visiting researchers, faculty members, and graduate students.

CIS 6971 Research for Master's Thesis (1-15)

CIS 7979 Advanced Research (1-12)
Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not open to students who have been admitted to candidacy. S/U.

CIS 7980 Research for Doctoral Dissertation (1-15)

CNT 5106C Computer Networks (3)
Prereq: CEN 4500C and COP 4600.
The course covers the design, implementation and internals of modern computer networks. While all layers will be introduced, the layers below the Application Layer will be the main focus. The main effort will be spent on the design issues for Transport Layer, Network Layer, Data-Link and MAC Layer, and other related topics.

CNT 5410 Computer and Network Security (3)
Prereq: COP 3530, COT 5405; coreq: COP 4600.
Issues, analysis, and solutions. Viruses, worms, logic bombs, network attacks, covert channels, steganography, cryptology, authentication, digital signatures, electronic commerce.

CNT 5517 Mobile Computing (3)
Prereq: CEN 4500C.
Emerging topics of wireless and mobile computing and networking including mobile computing models, mobile-IP, adhoc networks, Bluetooth, and 802. 11b. Mobile database access and mobile transactions in context of emerging field of M-commerce.

CNT 6107 Advanced Computer Networks (3)
Prereq: COP 5615, COP 5536, and CNT 5106C.
Computer network architecture, including topologies, media, switching, routing, congestion control, protocols, and case studies.

CNT 6885 Distributed Multimedia Systems (3)
Design issues; survey of recent advances, including compression, networking, and operating system issues.

COP 5536 Advanced Data Structures (3)
Prereq: COP 3530.
Development of efficient data structures used to obtain more efficient solutions to classical problems, such as those based on graph theoretical models, as well as problems that arise in application areas of contemporary interest.

COP 5555 Programming Language Principles (3)
Prereq: COP 3530.
History of programming languages, formal models for specifying languages, design goals, run-time structures, and implementation techniques, along with survey of principal programming language paradigms.

COP 5615 Distributed Operating System Principles (3)
Prereq: COP 4600.
The concepts and techniques of efficient management of computer system resources.

COP 5618 Concurrent Programming (3)
Prereq: COP 3100, 3530.
Overview of principles and programming techniques. Reasoning about concurrency, synchronization, program structuring, multi-threaded server applications.

COP 5625 Programming Language Translators (3)
Prereq: COP 5555.
Anatomy of translators for high-level programming languages.

COP 5725 Database Management Systems (3)
Prereq: COP 3530, 4600, or equivalent.
An introduction to systems and procedures for managing large computerized databases.

COP 6726 Database System Implementation (3)
Prereq: COP 4600 and 4720 or 5725.
DBMS architecture, query processing and optimization, transaction processing, index structures, parallel query processing, object-oriented and object-relational databases, and related topics.

COP 6755 Distributed Database Systems (3)
Prereq: COP 5615, 5725, and a course in computer networks.
Distributed database systems including the areas of distributed database design, resource allocation, access plan selection, and transaction management.

COT 5405 Analysis of Algorithms (3)
Prereq: COP 3530.
Introduction and illustration of basic techniques for designing efficient algorithms and analyzing algorithm complexity.

COT 5442 Approximation Algorithms (3)
Prereq: COP 3530 or COT 5405.
Fundamentals of algorithmic paradigms, analysis, techniques, and software. Topics include greedy methods, randomized algorithms, IP-rounding, approximability, covering, packing, clustering, and network problems.

COT 5520 Computational Geometry (3)
Prereq: COP 3530.
Design, analysis, and implementation of algorithms and data structures to solve geometric problems. Applications in graphics, robotics, computational biology, data mining, and scientific computing. Convex hulls, Voronoi diagrams, triangulations, arrangements and range searching.

COT 5615 Mathematics for Intelligent Systems (3)
Prereq: MAC 2313, Multivariate Calculus; MAS 3114 or MAS 4105, Linear Algebra; STA 4321, Mathematical Statistics.
Mathematical methods commonly used to develop algorithms for computer systems that exhibit intelligent behavior.

COT 6315 Formal Languages and Computation Theory (3)
Prereq: COP 3530 and familiarity with discrete mathematics and data structures.
Introduction to theoretical computer science including formal languages, automata theory, Turing machines, and computability.

Undergraduate Prerequisite Courses

It is expected that all new graduate students in the department will have as a minimum the following courses in their background. Students wishing to enter our graduate program with little or no formal computer science background must complete as a minimum all but one of these courses before applying for admission. Check with the Graduate Coordinator to see which courses you need to complete before applying if you lack a formal computer science background. Completion of these courses does not guarantee admission to our program.

MAC 2311 & MAC 2312 Analytic Geometry and Calculus 1 & 2
Introduction to analytic geometry; limits; continuity; differentiation of algebraic and trigonometric functions; differentials; introduction to integration and the fundamental theorem of calculus. Techniques of integration; applications of integration; differentiation and integration of inverse trigonometric, exponential and logarithmic functions; sequences and series.

STA 2023 or STA 3032 Statistics
Development of the fundamental statistical concepts and their relationship to the social and physical sciences or engineering. Probability, discrete and continuous random variables, estimation, hypothesis testing, and linear and multiple regression.

COP 3504 Introduction to CIS
Introduction to computers and algorithms. Programming in a high level language. Topics include procedural abstraction, data abstraction, and structure programming techniques. The student will learn the fundamentals of developing coherent, expressive programs. Prerequisite: MAC 2311 or MAC 2233.

COT 3100 Applications of Discrete Structures
Sets, relations, functions, and concept of cardinality. Propositional logic and applications. Predicate logic, induction and recursion. Finite state machines, grammars, languages. Graphs and trees. Elements of groups, semigroups, lattices, and Boolean algebra. Prerequisite: MAC 2311.

CDA 3101 Introduction to Computer Organization
Organization of computing systems. Logical basis of computer structure. Machine representation of instructions and data, flow of control, basic machine instructions. Assembly language programming. Prerequisite: CIS 3020 and MAC 2311 (or MAC 2233).

COP 3530 Data and Algorithm Structures
Analysis of algorithms (O, W, and Q notations); run time measurement; sequential, linked and indirect addressed representation methods; data structures such as arrays, stacks, queues, binary trees, heaps, graphs; algorithm design methods such as greedy, divide-and-conquer, dynamic programming, back-tracking, branch-and-bound, heuristics; sorting and search; hashing. Prerequisite: CIS 3020 with a grade of C or better and COT 3100.

COP 4600 Operating Systems
Concepts, design, and implementation of modern operating systems. Operating system management of processes, I/O, memory, and file systems. Prerequisite: COP 3530.

TEACHING ASSISTANT INFORMATION

TA Appointment Eligibility Policy

All appointments are subject to the availability of funds.

1. The TA pool for any semester is comprised of compulsories (those to whom the Department has made a commitment for that semester) and regulars (see below). The pool is finalized immediately after the announced TAAS open application period ends each semester.

2. For admission into the pool as a regular, a PhD student must, at the time of application:
   a. have a GPA of at least 3.5 (subject to change);
   b. have passed the written qualifying exams or have been in the PhD program for less time than the limit set for passing these exams;
   c. have a TSE/SPEAK score of 45 or better, or an iBT speaking-portion score of 23 or better;
   d. have satisfactory or better evaluations in all previous TA assignments (if any).

3. PhD students in the regular pool will be appointed at 25% FTE (subject to change) and must be available for work in Gainesville during the entire appointment period.

4. Departmental TA support for each PhD student is limited to at most 10 semesters (Fall and Spring) at 25% FTE per semester.

5. A faculty member who is advising 2 or more PhD students who are supported solely by departmental funds (e.g., TA and Fellowship), may not take on additional PhD advisees who also are supported solely by departmental funds.

6. A PhD student who cancels an accepted TA appointment without the approval of the instructor of the course he/she was assigned to will become ineligible for any future TA appointment in CISE.

Additional Requirement for all Teaching TA appointments: To be a Teaching TA, those with a TSE/SPEAK score of 45 or 50 or an iBT speaking-portion score of 23-27 must, by the start date of the appointment**,** have previously passed or be currently registered to take EAP 5836. A student who has a TSE/SPEAK score of 55 or an iBT speaking-portion score of 28 or better is exempt from the EAP 5836 requirement.

Overview

Who is a TA ?
Responsibilities of **Teaching TAs** include having sole responsibility for teaching one or more course sections (i.e., all lecturing, office hours, etc.).

Responsibilities for **Support TAs** include any or all of the following: grading, leading recitations, providing administrative support, and clerical tasks.

Which Courses Get TAs?
The CISE Department TA Committee determines the number of TAs per course based on enrollment and budget.

Who Makes TA Assignments?
TA Committee implements the assignment procedure of TAs to classes guided by the rules below.

Assignment
Continuing Graduate Students (CGS) are students that have been CISE graduate students for one semester or more at the start of the appointment. CGS are students with guaranteed support (also called 'compulsories').

Roughly, First Semester Students (FSS) are appointed by recommendation from the Graduate Committee, while CGS's are appointed according to instructor recommendation. Every semester, the TA Committee assigns a number of TA slots reserved for FSS and CGS's to particular courses. The number of slots is determined with input from the Graduate Committee, based on the need of the department to attract new, incoming students, and by the number of old commitments (fellowships, etc.). The distribution of slots to courses is determined by the TA Committee. Typically, the committee tries to distribute reserved slots equitably over lower level courses.

First Semester Students
time := 1 week before reappointments are due (typically the last week of classes of the previous semester).

- Until *time*, the Graduate Committee has the responsibility to select the pool of FSS eligible for the reserved slots.

- At *time*, the Graduate Committee informs the TA Committee of the number of slots it has covered. The TA Committee places selected FSS in the reserved slots.

- After *time*, instructors can recommend FSS for slots not covered. However, priority will be given to late Graduate Committee nominees.

Continuing Graduate Students (CGS)

- All CGS wanting to be a TA *must apply* for TA positions by filling out our **Online TA application form** (http://cise.ufl.edu/academics/grad/ta/taas/) in the semester prior to employment. This includes CGS with guaranteed support. CGS are also advised to approach instructors of courses for which they are well qualified to *solicit a recommendation* for assignment to a particular course.

- Instructors will be asked to *recommend* specific applicants *from the TA database* for unreserved slots of the courses they teach. Instructors are urged to interview candidates ahead of time to ensure their qualifications for, and interest in, a particular TA position. Instructors should let students know if a recommendation has been made.

- *Eligibility* of applicants to hold TA positions will be certified both initially and when semester grades become available. GPA and score in SPEAK tests will be considered. To be eligible for a TAship after his/her 4th semester at CISE (not counting summer terms), a CGS must have taken the comprehensive PhD qualifying exam. The Graduate Committee can petition for an exception from the last rule on behalf of PhD students with demonstrably exceptional circumstances.

- Where possible, eligible applicants who have been requested by just one instructor by the due date will be assigned to those courses. In all other cases, the TA Committee will try to assign according to the following guidelines.
    - If *more than one request for a given applicant* is received by the due date, the instructors involved will be notified of the conflict and asked to resolve it on their own. f If resolution is not achieved within 3 days, the TA Committee will assign based on the following factors:
        1. the skills/background/interest of the student vis-à-vis the courses in question,
        2. the student's previous TA assignments (preference will normally be given to continuing course and instructor assignments),
        3. the student's academic progress and scores,
        4. any commitment the Department may have with regard to assigning the student a TA position,
        5. the number of instructor recommendations already acted upon favorably for the courses in question.
    - If an instructor recommends *more than one student for a given position* the following factors, in order, will be considered in determining which student is assigned:
        1. The order in which the instructor ranked the students.
        2. Factors (1) through (4).
    - If an *instructor's request cannot be satisfied*, the instructor will be asked to make another recommendation after interviewing suitable, unassigned candidates.
    - If an instructor *chooses not to recommend*, TAs will be assigned according to (1) through (4).

Policy Regarding Periods of Absence for all CISE Teaching Assistants

All prospective TAs are required to identify any and all periods of time they expect to be absent from work from one week before the start of classes through the Monday following the end of classes (the day course grades are due). This information MUST be inserted at the end of the TAAS application form and will be provided to course instructors via the TAAS website before nomination/assignment occurs. After being provisionally assigned to a course, students who will be absent from work during the aforementioned period must meet with the course instructor within 2 business days to determine if acceptable accommodations for the absence can be made. If accommodation cannot be made, an alternative assignment will be sought by the TA Assignment Coordinator. If NO assignment can be found for which accommodations can be made, the student will not be appointed for the term in question.

Examples of work absences for which **accommodation can usually be made** include:

- Brief trips required to renew a visa when the trip cannot be taken during a break period and when it does not involve taking extra time to visit home or relatives
- Brief trips to present a paper at a conference or workshop within the U.S.
- Brief job interview trips within the U.S.

Examples of work absences for which **accommodation may not be possible** include:

- Trips to attend/present papers at one or more conferences or workshops that require being away from work for more than a total of 5 business days
- Other professional trips that require being away from work for more than 3 business days

Examples of work absences for which **accommodation will generally NOT be made** include:

- Vacation trips and other elective travel (except during break periods)
- Attending non-emergency family events such as weddings, birthdays, etc., (except during break periods)

GRADUATE FACULTY AND RESEARCH AREAS

Lisa Anthony
Ph.D., Carnegie Mellon University, 2008. Human-Centered Computing-- Computer interaction (natural user interaction, multimodal interfaces, child-computer interaction, educational interfaces); artificial intelligence, machine learning, pattern matching (handwriting recognition, sketch recognition, gesture recognition, adaptive interfaces).

Arunava Banerjee
Ph.D., Rutgers University, 2001. Computational neuroscience, intelligent systems, machine learning. Algorithms.

Manuel Bermudez
Ph.D., University of California – Santa Cruz, 1984. Programming Languages, compilers, automata theory, programming linguistics, software engineering.

Kristy Elizabeth Boyer
Ph.D., North Carolina State University, 2010. Human-centered computing

Kevin R.B. Butler
Ph.D., The Pennsylvania State University, 2010. Information Security, Security in Computer Systems and Networks, Enterprise and Portable Storage Security, Embedded & Cyber-Physical Systems Security, Cloud Computing Security, Privacy-Preserving Computing, Mobile Phone Security & Privacy, Interdomain Routing Security, Secure Data Provenance

Shigang Chen
Ph.D., University of Illinois at Urbana-Champaign, 1999. Computer networks, wireless technologies, cyber-physical systems, cloud computing, data streaming.

Shundra B. Daily
Ph.D., Massachusetts Institute of Techology, Media Lab, 2011. Human-Centered Computing, Affective Computing, Engaging youth in STEM through the arts, Utlizing technology to cultivate empathy, Supporting diverse teams in working together

Douglas Dankel
Ph.D., University of Illinois at Urbana-Champaign, 1980. Expert systems, artificial intelligence, medical applications of artificial intelligence, computer science education, information retrieval.

Alin Dobra
Ph.D., Cornell University, 2003. Approximate processing of database queries (histograms, sampling, sketches), and foundations of data-mining/machine learning.

Alireza Entezari
Ph.D., Simon Fraser University, 2007. Multidimensional signal processing, image processing, compressed sensing and sparse approximation, biomedical imaging and scientific visualization, multivariate approximation.

Paul Gader
Ph.D., University of Florida, 1986. Hyperspectral image analysis, image processing, algorithms for landmine detection, fuzzy set based algorithms, image and signal analysis, Choquet integral based mathematical morphology.

Christina Gardner-McCune
Ph.D. , Georgia Institute of Technology, 2011. Computer Science Education, Design of Learning Technologies & Learning Environments, K-12 Computing After-school & summer Camps, Learning Sciences

Juan E. Gilbert
Ph.D. , University of Cincinnati, 2000. Human-Centered Computing (user experience & accessibility), Spoken language systems, Electronic Voting Systems, Advanced Learning Technologies, Culturally-Relevant Computing, Brain-Computer Interaction, STEM Workforce Development.

Sumi Helal
Ph.D., Purdue University, 1991. Applications of Pervasive and Mobile Computing in the domains of disabilities, aging, and smart health and wellbeing

Ahmed Helmy
Ph.D., University of Southern California, 1999. Wireless networks design, mobility modeling, network simulation, protocol architecture and design, sensor networks, mobile social networks, mobile networks measurement.

Eakta Jain
Ph.D., Carnegie Mellon University, 2012. Human-centered computer graphics, applied perception, and data-driven algorithms

Tamer Kahveci
Ph.D., University of California – Santa Barbara, 2004. Bioinformatics (indexing, storing, accessing and use of bioinformatics data).

Jonathan C. L. Liu
Ph.D., University of Minnesota, 1996. Multimedia communication, high-speed wired and wireless networks, storage systems, artificial intelligence.

Benjamin Lok

Ph.D., University of North Carolina – Chapel Hill, 2002. Human-computer interaction (virtual humans for medical training), UX/UI design, virtual reality, computer graphics.

Kyla McMullen
Ph.D., University of Michigan, 2012. Human-Centered Computing utilizing spatial audio rendering techniques to sonify positional data for aiding situational awareness, discovering critical interface design techniques for developing virtual auditory environments, using virtual spatial audio to augment assistive technology for persons with visual impairments, enhancing immersion and realness in virtual worlds using spatial audio

Prabhat Mishra
Ph.D., University of California – Irvine, 2004. Design automation of embedded systems, VLSI CAD algorithms, security and reliability of multicore system-on-chip architectures, energy-aware computing, hardware/software verification using simulation and formal methods, trustworthy systems.

Richard Newman
Ph.D., University of Rochester, 1987. Networks (modeling, simulation, congestion control, multipath routing, error control, powerline communications), distributed systems (overlay networks, fault tolerant services, P2P systems, distributed file systems), computer and network security (access control models, multilevel secure systems, policy modeling, cryptographic protocols, steganography, steganananalysis, traffic analysis, anonymity, trust models), distributed collaboration and CSCW (interorganizational collaboration, infrastructure for CSCW over WANs, group management models).

Jih-Kwon Peir
Ph.D., University of Illinois at Urbana-Champaign, 1986. Computer architecture, GPU architecture and programming.

Jorg Peters
Ph.D., University of Wisconsin – Madison, 1990. Rapid design of complex geometry, GPU techniques, real-time graphics, surgery simulation, multivariate splines, scientific computing, visualization.

Anand Rangarajan
Ph.D., University of Southern California, 1991. Image analysis, applied machine learning, computer vision, pattern recognition, biomedical image analysis.

Sanjay Ranka
Ph.D., University of Minnesota, 1988. Data mining, informatics, and grid computing for data-intensive applications in high-energy physics, bioterrorism and biomedical computing.

Gerhard Ritter
Ph.D., University of Wisconsin – Madison, 1971. Autonomous target recognition, hyperspectral imagery, biomimetics, autonomous guidance of spinning projectiles, neural networks, artificial neurons with dendritic and axonal tree structures.

Sartaj Sahni
Ph.D., Cornell University, 1973. Sequential and parallel data structures and algorithms, bioinformatics, scheduling, optimization, VLSI CAD, computational geometry, image processing, medical applications, network algorithms.

Beverly Sanders
Ph.D., Harvard University, 1985. Software engineering and programming languages for concurrent and high-performance parallel computing.

Mark Schmalz
Ph.D., University of Florida, 1996; O.D., Pacific University, 1979. High-performance parallel and embedded computing, computer vision and pattern recognition, automated processing of natural language, data compression, cryptology, psychoacoustics, computer-generated music.

Markus Schneider
Ph.D., FernUniversitaet Hagen, 1995. Database technology (emerging applications: spatial, spatiotemporal, moving objects, and geographic information system applications; complex object/big object management).

Tom Shrimpton
Ph.D.,

Meera Sitharam
Ph.D., University of Wisconsin – Madison, 1990. Geometric constraint systems and applications to molecular sciences, computer-aided mechanical design, robotics, machine learning, teaching via geometry; geometric and algebraic computation and complexity theory; self-organizing, peer-to-peer 3and game-theoretic mechanisms; theoretical computer science; algorithms and complexity; mathematical and computational modeling; computational thinking and computer science education in K-12.

My T. Thai
Ph.D., University of Minnesota, 2005. Complex networks including online social networks, sensor networks, critical network infrastructures, smart-grids; cybersecurity; combinatorial optimization; approximation algorithms.

Stephen Thebaut
Ph.D., Purdue University, 1983. Requirements engineering (operational modeling, elicitation, analysis), software testing and verification (software analysis, test case design, function-theoretic verification), software engineering education and technology transfer (short course development, just-in-time training, graduate programs for working software professionals), software development process and protocols.

Corey Toler-Franklin

Ph.D., Princeton University, 2011. Computer Vision & Medical Image Computing, Image and Signal Analysis

Patrick Traynor
Ph.D., Pennsylvania State University, 2008. Cellular and Mobile Security, Internet security, systems security, Applied Cryptography, National Policy.

Alper Üngör
Ph.D., University of Illinois at Urbana-Champaign, 2002. Computational geometry, with special emphasis in mesh generation, understanding mathematical structure of engineering problems and developing provably good algorithms to solve them.

Baba Vemuri
Ph.D., University of Texas – Austin, 1987. Medical image analysis, image processing, computational vision, computer graphics, statistical learning, information geometry, applied mathematics.

Daisy Zhe Wang
Ph.D., University of California – Berkeley, 2011. Data science research, combining technologies in data processing systems and statistical machine learning, and algorithms to support large-scale and advanced data analysis.

Joseph Wilson

Ph.D., University of Virginia, 1985. Intelligent systems, cybersecurity, ethical hacking, file systems, programming languages.

Damon L. Woodard
Ph.D., University of Notre Dame, 2005. Research interests include biometrics, pattern recognition/machine learning, image/signal analysis, and identity sciences.

Ye Xia
Ph.D., University of California – Berkeley, 2003. Networking (modeling and performance evaluation of networks; peer-to-peer overlay networks, content and service distribution; congestion control, internet resource allocation and pricing, network flow and routing; wireless, ad-hoc and sensor networks), probability theory, stochastic processes, statistics, queuing theory.

Rong Zhang
Ph.D., Rutgers University, 2006. Interactive modeling, computer-aided animation and modeling, computer vision, pattern recognition.

APPENDIX 1

Table 1. Summary of Graduate Degree Requirements

Requirements	DAS (thesis)	DAS Project in Lieu of thesis	CSC/CEN M.S./M.E. (thesis)	CSC/CEN M.S./M.E. (non-thesis)	Ph.D.
Total credit hours	30	30	30	30	90[a]
Minimum CISE credit hours	30	30	24*	24*	see PhD summary below
Minimum number of supervisory committee members	3	2	3	n/a	5[b]
Qualifying Exam required	no	no	no	no	yes[c]
Final Exam	oral[d]	oral[d]	oral[d]	written[e]	oral[f]
Time limit for completing degree	7 years	7 years	7 years	7 years	5 years[g]

\# Project in Lieu of Thesis
* May include: 1 credit CIS6935, 3 credits CIS6905, excludes CIS6910

a May include 30 credit hours from Master's program
b May include 1 member outside the CISE Department
c Written portion before end of 5th semester
d Part of thesis defense or Project in Lieu of Thesis presentation
e Exam part of exit interview
f Part of dissertation defense
g From admission to candidacy

APPENDIX 2

Table II. Expanded Summary of Ph.D. Coursework Requirements

Ph.D. Student w/ prior Master's **credit hours**	Ph.D. Student w/o prior Master's **credit hours**	**TYPE**
30	n/a	from prior Master's degree (maximum allowed)
12	12	Graduate core courses – must have 2 theory & 2 systems THEORY: COP5536, COT5405, COT6315 SYSTEMS: CDA5155, CNT5106c, COP5555, COP5615
6	24	CISE graduate-level courses: - Excludes CIS6905, 6910, 7979, 7980 - Includes CIS6935 (3 credits required) - CIS6971 may account for 6 credits for thesis-option CISE Masters
39	51	Other graduate-level courses (including research courses and courses outside the CISE Department
3	3	CIS7980 – research for doctoral dissertation (minimum requirement)
90	90	TOTAL (minimum)

Graduate Student Resources

Emergency Contacts

UF Police Department (352) 392-1111	UF Health (352) 265-0111
Dean of Students Office (352) 392-1261	Student Health Care Center (352) 392-1161

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http://www.housing.fuledu/about
(352) 392-2171

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GatorGradCare

General GatorCare information can be found online here: http://gatorcare.org

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Gainesville, FL 32611-2662
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University Registrar
http://www.registrar.ufl.edu
222 Criser Hall, PO Box 11400
Gainesville, FL 32611-4000
Phone: (352) 392-1474 Fax: (352) 846-1126

Office of Admissions
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Gainesville, FL 32611-4000
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