I. INTRODUCTION

The Department of Computer Science at the University of Colorado Colorado Springs (UCCS) offers the Doctor of Philosophy (Ph.D.) degree in Engineering with a focus in Computer Science.

The purpose of this set of guidelines is to help prospective students enter the PhD program and to assist admitted students in meeting the requirements of the program. The degree requirements are those of the computer science graduate faculty at Colorado Springs. Other regulations may be imposed by the College of Engineering and Applied Science and Graduate School of the university. It is the student's responsibility to know and satisfy all relevant requirements.

Graduate students are encouraged to participate in the professional activities of the department. This includes attending seminars and colloquiums, suggesting improvements in curriculum (both undergraduate and graduate), suggesting new teaching techniques and participating in the enhancement of computer hardware and software facilities within the department.

II. ADMISSION

Students may be admitted in one of two categories:

A. Regular Degree Students

A student can be admitted as a regular degree student if the student satisfies the following conditions:

1. The student holds a bachelor's degree in computer science or a master's degree in computer science or closely related field from a college or university of recognized standing. A student who is admitted without a master's degree may earn that degree as a part of the Ph.D. studies.

2. The student has at least a 3.3 grade point average (on a scale of 4.0) in all undergraduate and graduate work attempted or who has achieved a 3.3 or better in master's degree from the Department of Computer Science at the University of Colorado.

3. If the student is not a graduate of a program of recognized standing, or has a GPA below the minimum requirements, the Graduate Record Examination (GRE) may be required with a minimum score of 148 on the quantitative portion.

4. The student has taken at least two semesters of calculus and a course each in discrete mathematics, probability and statistics, and linear algebra.
5. Students whose previous education was not in the English language must take either the TOEFL examination with a minimum score of 80 (internet based) or IELTS with a minimum score of 6; or have graduated from an accredited U.S. university and have performed satisfactorily; or complete an approved English as a Second Language program through level 5 or level 112 (depending on the program).

B. Provisional Degree Students

Students who do not meet requirements for admission as regular students may be admitted as provisional students upon recommendation of the Computer Science Department. With the concurrence of the Graduate Dean, the Graduate Studies Committee may admit provisional students for a probationary period. After completing the noted provisional requirements, the provisional student will be considered for regular admission. If admission is denied at this time, the student will be dismissed from the program.

Recommendation for change from provisional status to regular degree status will be based on grades received in all courses taken during provisional status. Credit earned while in provisional status will count towards the Ph.D. if and when the student moves from provisional to regular status.

Transfer Policy

The Program Director will determine how many credit hours of course work may be transferred from a previously earned Master’s Degree or from other universities if a degree was not obtained. This includes courses taken at UCCS before the student is accepted into the Ph.D. program. Only courses at the graduate level in which the student has received a grade of B or above are eligible for transfer. None of the hours of dissertation credit may be transferred. The Program Director and the Chair of the Department must approve all transfers.

Application Materials

The online application is available here: http://www.uccs.edu/admissions/apply.html. Supporting documentation (transcripts, etc.) should be sent directly to the Admissions Office, University of Colorado Colorado Springs, 1420 Austin Bluffs Parkway, Colorado Springs, CO 80918-3733.

The Computer Science Graduate Studies Committee (GSC) meets periodically for action on completed applications. It is the responsibility of the applicant to assure that all materials are received by the application deadline for the admit term requested. The applicant being considered for admission will be notified in writing of the results of the decision.

Applicants for regular admission should have all application materials submitted by June 1st for Fall Semester and by November 1st for Spring Semester. These deadlines permit time for the GSC, the college and the Graduate School to process the application. It is the applicant’s responsibility to follow up to make sure all materials are received on time. If these deadlines are not met, an application for regular admission will be considered for the following semester.

International applicants applying for the program should have all application materials submitted by April 1st for Fall Semester and by October 1st for Spring Semester. Applications sent later than these dates or incomplete by these dates may be considered for the following semester. It is the applicant’s responsibility to follow up to make sure all materials are received on time.

III. DEGREE REQUIREMENTS

Curriculum Description

The Doctor of Philosophy is a degree that is conferred on a student who has demonstrated proficiency in some broad area of learning, and who has proven that he or she has the capability to evaluate work in the field critically. In addition, the student must have demonstrated the ability to work independently and make original contributions to the field. No single prescribed set of courses can be established that, when completed, guarantee that the student has attained this high level. Rather, the degree is conferred after the student has
satisfied both course work and dissertation requirements under the supervision of an advisor and committee. Minimum course work and dissertation requirements and the composition of the advisory committee for the Ph.D. program are described below.

**Credit Hours**

For candidates entering the program with a bachelor's degree in computer science, a minimum of 30 credit hours of course work at the 5000-level or above is required. For candidates entering with an M.S. degree in computer science, up to 24 credit hours of course work from a previously earned Master’s degree may be transferred to the PhD program to meet the 30 credit hour course requirements. In all cases, 30 semester hours of dissertation credits are required. Three courses are required for students who have not taken these courses or their equivalents before. These are CS 5500 (Operating Systems), CS 5700 (Computability, Automata, and Formal Languages), and CS 5720 (Design and Analysis of Algorithms). All PhD students must also take CS 6000, Intro to Computer Science Research as part of their course work.

No more than 15 dissertation hours can be taken prior to the semester in which the Comprehensive Examination is passed.

**Plan of Study**

A Ph.D. plan of study is a document that lists the courses that a student has/will take to fulfill degree requirements. It also lists course deficiencies and transferred courses. A student must develop a plan of study by the end of the first semester after the semester in which the written qualifying examination is passed or waiver obtained. The plan is developed with the assistance of the student's advisor, and must be approved and signed by the advisor and program director. Any subsequent changes of the plan must be approved by the advisor.

**Advisory Committee**

A student is to choose an advisor by the end of the first year in the program. You may change your advisor by mutual agreement at any time. The advisory committee shall be formed early in the dissertation research so that the committee can support the research. The student and advisor will form the advisory committee subject to the following requirements:

A. The advisory committee will consist of 5 members. Three of the members must be from the home department with at least one member of the committee being from outside the home department.

B. A maximum of two members from outside the college of EAS may serve on the committee. They must be members of the graduate faculty.

C. The committee should reflect the focus area of the dissertation work and be able to support and evaluate the students work.

D. The student and advisor will propose the committee to the DGSC and the PGC for approval.

Advisory Committee Authority: Subject to the requirements for the PGC, the committee is fully responsible for all aspects of the student’s academic program, research and dissertation.

**Examinations**

Satisfactory performance of the student is judged not only by course grades and dissertation credit, but also by performance on a series of examinations described below.

**Qualifying Examinations**

The qualifying examinations consist of two parts - a written exam covering the topics of Computability, Automata and Formal Languages; Design and Analysis of Algorithms; Computer Architecture; and Operating Systems; and an oral exam.
The oral qualifying examination consists of an oral presentation with a written report that surveys the literature in the planned research area that a student may pursue. A few example papers, recommended by the PhD program committee will be posted and available to students for reference. The examining committee will be organized by the advisor. The examining committee consists of three faculty members from the host department.

The topic of the examination will be determined by the student’s advisor in consultation with the examining committee.

Students having any sponsorship via the advisor’s research funding or departmental teaching should pass the oral exam by the end of the first year after admission to the program. Other PhD students should pass the oral qualifying examination by the end of the second year after admission to the program. The advisor or the program director may request one additional year and one more time for a student to pass the examination.

Waiver to the oral qualifying examination may be given if a student, as the first author, has one paper published or accepted for publication in peer-reviewed sources, such as well-recognized international journals and highly-selective international conference proceedings. The work of the paper must be done after joining the program. The request is initiated by the advisor.

The written examination for the Computer Science focus area consists of four required topics: Computer Architecture; Operating Systems; Computability, Automata and Formal Languages; and Design and Analysis of Algorithms.

The examination takes place twice a year for all students in May and December.

A student can take the examination up to two times: Students only need to retake the failed topics in the subsequent attempt. Students having any sponsorship via the advisor’s research funding or departmental teaching should pass all topics by the end of the second year after admission to the program. Other PhD students should pass all topics by the end of the third year after admission to the program. The advisor or the program director may request one additional year and one more time for a student to take the examination with a sound reason; for example, the student has made significant progress in research with good publication(s). The request needs the approval of the PhD-CS program committee.

Waiver to the written qualifying examination will be given if the student has passed the required courses (CS 5200, CS 5500, CS 5700 and CS 5720) of the four qualifying examination topics at UCCS with a minimum cumulative GPA of 3.75. The program committee will decide if the grade of a transferred class can be used. Courses cannot be retaken to increase GPA in order to qualify for the waiver.

**Comprehensive Examination**

The purpose of the comprehensive examination, which must be taken before more than 15 hours of dissertation credit is earned, is to ensure that the student possesses the following:

1. Sufficient grasp of the fundamentals of the chosen thesis area to begin research, normally achieved through a thorough study of the current literature on the topic
2. Ability to conduct research
3. Ability to exchange ideas and information with members of the Advisory Committee

Comprehension of existing literature and course material pertinent to the dissertation research, as well as the reasonableness of the unknown or undeveloped concepts that the student proposes, will be assessed by the Advisory Committee. The responsibility of the Advisory Committee is to review the research proposal and the qualifications of the student to complete the research successfully. If the research and the approach are found to be significant and appropriate and the student is judged capable of completing the research, the Advisory
Committee will approve the research direction. If the Advisory Committee does not find the student ready to begin dissertation research, it must suggest further preparation by the student and plan on a subsequent comprehensive examination.

A passing grade in the examination is given if at least four of the five members of the Committee, including the student’s advisor, vote affirmatively.

*Final Examination (Dissertation Defense)*

The dissertation must be based on original investigation. It must demonstrate mature scholarship and critical judgment, as well as a familiarity with the tools and methods of research. It must be written on the subject approved in the comprehensive examination.

Although publication is not the only criterion, generally, it is expected that a Ph.D. candidate at the dissertation defense stage has at least one significant article published or accepted for publication in peer-reviewed sources, such as well-recognized international journals and highly-selective international conference proceedings. The department criterion defines a significant publication as having ALL three of these characteristics: 1) Multiple formal written reviews, 2) Publication in a venue with < 40% acceptance rate, and 3) Indexed in major library databases. If a candidate’s publications do not meet these criteria, the candidate’s advisor can request the committee to also consider other justifiable criteria including grants, patents, major software packages in widespread use, etc. All those achievements should be largely based on the study and research during the degree work.

After the dissertation has been completed, a final exam on the dissertation and related topics is conducted. This exam, which is conducted by the Advisory Committee, is oral and is open to anyone who wants to observe. More than one negative vote by members of the Advisory Committee disqualifies the candidate in the final exam. In case of failure, the final examination may be retaken after a period of time determined by the Advisory Committee.

**IV. RESIDENCY REQUIREMENT**

The minimum residency requirement is six credit hours of regular courses at the 5000 level and above not including dissertation credit hours.

**V. TIME LIMIT FOR COMPLETION OF DEGREE**

Individuals who are admitted as doctoral students normally are expected to complete all degree requirements within six years from the date of the start of course work in the doctoral program. For students who fail to complete the degree in the six-year period, the Department must file an annual statement with the Graduate Dean giving the reasons why the Program Director believes that the student is making adequate progress and should be allowed to continue in the program. This request must be signed by three members of the graduate faculty who serve on the student’s Advisory Committee. If the Graduate Dean approves this statement, the students may continue his/her studies for one additional year.

**VI. Further Information**

For more information, call (719) 255-3325, visit our Web site at [http://eas.uccs.edu/cs](http://eas.uccs.edu/cs), or e-mail st-cs01@uccs.edu.