



University of Colorado
Colorado Springs

College of Engineering and Applied Science
Department of Computer Science

Guidelines for
Doctor of Philosophy

Computer Science
Last Updated: February 2026

I. INTRODUCTION

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

The purpose of this set of guidelines is to help prospective students enter the PhD program and to inform admitted students of the program's requirements. The degree requirements outlined in this document have been created by the graduate faculty in the Computer Science Department. Other rules and regulations may be imposed by the College of Engineering and Applied Science and the 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 organized by the department, the college and the campus, such as attending research seminars, presentations, competitions and colloquia, and participate in student-oriented social activities.

II. ADMISSION

Each member of the CS PhD Program Committee (CS-PPC), comprised of several graduate faculty, evaluates each applicant and makes recommendation to the CS PhD Program Director, who is the chair of CS-PPC. The Program Director takes the recommendations into account and may admit the applicant 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 a closely related field from a college or university of recognized standing, e.g., a US-based R1 or R2 university, or a US or international academic institution of repute. 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.
3. If the student is not a graduate of R1 or R2 university and/or an ABET-accredited program, 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. The GRE is required of all students who have graduated from non-US institutions.

4. The students must have taken the equivalent of the following UCCS courses: Principles of Computer Science (CS 1150); Data Structures and Algorithms (CS 1450); Programming in UNIX (CS 2080); Programming in C (CS 2060); Computer Organization and Assembly Language Programming (CS 2160); Concepts of Programming Languages (CS 3160); Software Engineering (CS 3300); Calculus 1 (MATH 1350); Calculus 2 (MATH 1360); Discrete Math (MATH 2150 or CS 2150); Probability and Statistics (MATH 3810 or CS 2020); and Linear Algebra (MATH 3130 or CS 2300).

5. International students whose undergraduate education was not in the English language must take either the TOEFL examination, obtaining a minimum score of 80 or IELTS with a minimum score of 6.5 or DUOLINGO score of 105; or must have subsequently graduated from a U.S. university; or complete an approved English as a Second Language program through level 5-

B. Provisional Degree Students

Students who do not meet requirements for admission as regular students may be admitted as provisional students. The provisional status is for a clearly stated probationary period with explicit requirements. After completing the 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 completion of all stated requirements and grades received in all courses taken during provisional status. Graduate credit earned while in provisional status will count towards the Ph.D. if and when the student moves from provisional to regular status.

C. Transfer Policy

The CS PhD 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 graduate 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. Independent study or dissertation credit hours may not be transferred. The CS PhD Program Director and the Chair of the Department or designee must approve all transfers.

D. 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. Applications are accepted solely online.

The Computer Science PhD Program Committee (CS-PPC) 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.

US applicants should have all application materials submitted by February 1st for Fall Semester and by October 1st for Spring Semester. These deadlines allow time for the department, 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 February 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 an area of learning within the discipline of Computer Science, and who has proven that he or she has the ability to evaluate published work in the area critically. In addition, the student must demonstrate the ability to work independently and make original contributions to the area. No single prescribed set of courses can be established to assess such a goal, when completed, guarantees 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 an advisory 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. In all cases, 30 semester hours of dissertation credits are required. All PhD students must take CS 6000, Introduction to Computer Science Research as part of their course work. A waiver to take CS 6000 may be entertained if the student publishes a paper in a high-quality venue while at UCCS, as first author and with approval of CS PhD Program Director.

No more than 24 dissertation hours can be taken prior to the semester in which the Comprehensive Exam is passed, as described below.

Plan of Study

A Plan of Study is a document that lists the courses that a student has taken or will take to fulfill degree requirements. It also lists course deficiencies and transferred courses. A student must develop a Plan of Study (obtained from the department office) by the end of the first year of study. The plan is developed with the assistance of the student's advisor and must be approved and signed by the advisor and CS PhD Program Director. Any subsequent changes of the plan must be approved by the advisor and the CS PhD Program Director.

Advisory Committee

A student is required to identify one or more faculty members in the department as potential advisor(s) at application time. Each student is assigned an advisor at admission time, based on a mutual understanding between the student and the advisor. The student may change advisor at any time provided the new advisor agrees. An Advisory Committee shall be formed early in the dissertation research so that the committee can support the student's 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 members must be from the Department of Computer Science with at least one member of the committee being from outside the Department. Outside members can be from any department on campus, as well as outside of UCCS. All members of the committee must be on graduate faculty; for committee members from outside, this may require concurrence of Graduate School.
- B. The committee should reflect the focus area of the dissertation work and be able to support and evaluate the students work.
- C. The student and advisor will propose the committee to the CS PhD Program Director for approval.

Advisory Committee Authority: The Advisory Committee makes decisions regarding the student's passing of required examinations, viz., proposal exam, and PhD defense.

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 Qualifying Examination**, and an **Oral Qualifying Examination** also called the **Comprehensive Examination**.

Written Qualifying Examination and/or Required Classes

A PhD student needs to demonstrate proficiency in four areas within Computer Science out of the following eight. UCCS CS Graduate course numbers and the title of the courses are given below.

- CS 5200: Computer Architecture
- CS 5300: Software Engineering
- CS 5500: Operating Systems
- CS 5720: Algorithms
- CS 5730: Algorithmic Game Theory
- CS 5800: Computer Graphics
- CS 5820: Artificial Intelligence
- CS 5985: Cybersecurity Metrics

Special Situation: Since the topics for Qualifying Examination were changed in 2025-26, students admitted to the CS PhD program prior to the 2025-26 academic year, will be allowed to include CS 5700: Computability, Automata and Formal Languages as an additional topic in the Written Qualifying Examination.

The Written Qualifying Examination is given two times during the year: at the beginning of each of the Fall and Spring semesters. It is an in-person exam where one hour is allotted for each of the **four chosen topics**. One or more sections of the qualifying examination can be taken at a time. Sections of the examination can be re-taken.

A student **must qualify** in all four areas **either** by passing a section of the Written Qualifying Examination **or** by getting a grade of A- or above in the corresponding course.

A student having any sponsorship via the advisor's research funding or departmental teaching assistantship or any other form of campus-based funding **must** qualify on all four areas by the end of the second year after admission to the PhD program. Other PhD students **must** qualify on all four topics by the end of the third year after admission to the program.

A course can be **retaken a second time** to qualify on a topic although all courses taken will be on UCCS transcript. A student may transfer in graduate classes after successfully completing the first semester at UCCS, to include possibly qualifying examination classes. Such classes must be from a US-based R1/R2 university as defined by Carnegie Foundation's Research Universities. In the case a student requests to use coursework taken at a non-R1/R2 institution or an institution outside the US, the CS PhD Program Director, will make the decision, in consultation with CS-PPC as necessary.

A student who has not qualified on all four topics within the time stated above will be **dismissed** from the PhD program.

Comprehensive Examination aka Oral Qualifying Examination

The Comprehensive Examination consists of an oral presentation with a detailed written report that surveys the literature in the planned research area that a student may pursue for PhD dissertation. The topic of the examination is determined by the student in consultation with his/her advisor. The advisor may recommend a few impactful published papers for the student to get started. The Examining Committee will be organized by the

student and the advisor. The Examining Committee consists of three faculty members from the Computer Science department. The Comprehensive Examination must be completed prior to enrolling in dissertation hour #16.

Students having any sponsorship via the advisor's research funding or departmental teaching assistantship or any other substantial campus-based funding **must** pass the Comprehensive Examination by the end of the **second** year after admission to the program. Other PhD students **must** pass the Comprehensive Examination by the end of the **third** year after admission to the program. The student, with concurrence of the advisor may request one additional year and one more time for a student to pass the examination. The decision for extension of the time will be made by the CS PhD Program Director.

Waiver to the Comprehensive 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 reported in the paper must have been performed after joining the PhD program at UCCS. The request is initiated by the student with recommendation from the advisor. The paper must meet the criteria for a significant publication given below. The waiver decision is made by the CS PhD Program Director. One paper can be used for one waiver only: either CS 6000 or the Comprehensive Examination.

A student who has not passed the Comprehensive Examination or have had it waived within the time stated above will be **dismissed** from the PhD program.

Publications

A Ph.D. candidate coming to the dissertation defense **must** have at least one **significant** article published or accepted for publication in a peer-reviewed source, such as a well-recognized international journal or a highly selective international conference.

A significant student publication is a peer-reviewed paper (i) with multiple formal written reviews, (ii) that is indexed in a major library database, (iii) has at least 5 double-column pages or 10 single-column pages, and (iv) meets one of the following three requirements:

- The venue in which the paper is published is in the top 20 of any Google Scholar Engineering and Computer Science subcategory or has a Google metric h-index of at least 20.
- The paper has at least 30 non-self-citations in Google Scholar.
- The venue has an acceptance rate lower than 40%.

Petition to accommodate a specific paper must be made by the student with support from the advisor. The CS PhD Program Director must approve.

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 these achievements should be largely based on the study and research during the degree work.

Dissertation Proposal

The minimal requirements for a Ph.D. student to ~~de~~ present Ph.D. Dissertation Proposal include the following:

- The student must have passed CS 6000, Introduction to Computer Science Research, with a grade B or above, or have it successfully waived CS 6000 via a publication, as discussed in a previous section. If the student's grade in this class is below B, the student may repeat this course once, with the approval of the CS PhD Program Director. In case the student's grade in CS 6000 is still below B, the student **must** have a publication, as first author, before giving the Proposal. Petition can be made with support from the advisor, for approval by the the CS PhD Program Director in case of issues regarding if a specific publication qualifies.

- The student has successfully passed the Comprehensive (oral) Examination, or has successfully waived it with a publication, as described above, while noting that **one publication can only be used for one waiver purpose.**
- The student has successfully qualified on each topic for the Written Qualifying Examination or has taken the corresponding course and received a grade of A- or above, as described above.

The purpose of the Dissertation Proposal, which must be taken before more than 24 hours of dissertation credit are earned, is to ensure that the student possesses the following:

1. Sufficient grasp of the fundamentals of the chosen dissertation area to begin research, normally achieved through a thorough study of the current literature on the topic
2. Ability to write a sufficiently detailed plan of research, developed in collaboration with the advisor, that will lead to a successful dissertation with a certain amount of time.
3. Ability to exchange ideas and information with members of the Advisory Committee in the form of a scheduled presentation on the plan of research, and answering any questions the committee members may have in a satisfactory manner.

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. 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 examination. The Advisory Committee will make the decision based on a written proposal document and a presentation followed by a verbal question-answer session.

A passing grade in the examination is given if a majority of the five members of the Committee vote affirmatively. The student's advisor's vote must be positive.

Final Examination (Dissertation Defense)

Before a Ph.D. candidate applies to take the Dissertation Defense, the candidate must have at least one significant publication as first author, published during the Ph.D. study period. In the case a candidate has no significant publication, the candidate's advisor can request the Dissertation Committee to consider other justifiable criteria such as patents or major software packages in widespread use, which should be largely based on the study and research during the degree work. The final approval for waiving a publication is with the CS PhD Program Director.

The dissertation must be based on original investigation. It must demonstrate familiarity with the tools and methods of research, mature scholarship and critical judgment, and importantly, acceptable contributions to human knowledge of the dissertation topic, as judged by the Advisory Committee. The dissertation is a detailed formally written document on the topic approved in the Comprehensive Examination.

After the dissertation has been completed, a final examination on the dissertation and related topics is conducted. This examination, which is conducted by the Advisory Committee, is oral and is open to anyone who wants to observe. A majority of the Advisory Committee, must vote for the student to pass the defense. Determination to pass is based on the dissertation document, the oral presentation, and the answers the student gives to questions from members of the committee. The advisor's vote must be positive. In case of failure, the dissertation defense may be retaken after a period of time determined by the Advisory Committee. Only two attempts at defense are allowed.

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 ten years from the date of the start of course work in the doctoral program. For students who fail to complete the degree in the ten-year period, the Department must file an annual statement with the Graduate Dean giving the reasons why the CS PhD 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. Validation of Courses

If at the time of graduation, a PhD student has one or more courses that were taken more than ten years ago at UCCS (or another institution if the courses were transferred), the courses must be validated. In other words, the student must find one or more faculty members at UCCS CS Department who will work with the student to certify that the student's knowledge of the topic of the course is current. The faculty member may validate in any reasonable way he/she chooses. For example, it may consist of an oral exam, a written exam, a project or a paper. The student's advisor and the PhD program director will facilitate the validation of courses, when necessary.

VI. Further Information

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