



Computer Science

TENNESSEE TECH

Admission Requirements for the Ph.D. Degree in Engineering

Computer Science (CS) Ph.D. Admission Criteria are:

- Master's degree in Computer Science or a related field from an accredited institution
- GPA ≥ 3.5 on a 4.0 scale
- GRE General Test Scores Verbal + Quantitative ≥ 1100 and Analytical ≥ 3.5
- Three letters of recommendation from faculty familiar with the academic ability of the applicant.
- International students must score at least 550 (79 internet-based, 213 computer-based) on the Test of English as a Foreign Language (TOEFL) **or** base score of 5.5 on the International English Language Testing System (IELTS).

Though the general requirement for admission to the Ph.D. program is a master's degree in an appropriate discipline, students with a bachelor's degree may be admitted to the Ph.D. program directly on exceptional basis, provided the applicant has a record of excellent academic performance in an appropriate science or engineering undergraduate program. The applicant's test scores, personal recommendations, and relevant work experience must indicate a high potential for success in doctoral studies and research. In addition, factors such as appropriateness of the applicant's research objectives to the research interests of the program faculty, availability of faculty to supervise the applicant's research, and prior research accomplishments of the applicant will also influence the admission decision.

Fulfilling the minimum requirement does not guarantee admission; an applicant who does not meet the above minimum, but appears to have reasonable potential for success as a Ph.D. student, may be admitted to provisional standing. His/her status may be changed to full standing after satisfying requirements specified by the Associate Dean of Engineering for Graduate Studies and Research, in consultation with the appropriate departmental chairperson, at the time of admission. In the case of Provisional admission, conditions for reclassification to Full standing are specified in the letter of admission. These conditions are typically one or more of the following: i) attainment of 3.5 GPA in the first semester of graduate study at TTU, ii) satisfactory GRE scores, and iii) successful completion of specific undergraduate CS "bridging" courses for a non-CS entering student. If the student meets the specified conditions during the first two semesters, the VP of Graduate Studies reclassifies the student to Full standing.

If admitted in provisional standing, the student must remove all deficiencies and apply for reclassification to full standing prior to the completion of fifteen (15) graduate hours.

Degree Requirements for the Ph.D. Degree in Engineering

A. Students Admitted with a Master's Degree

A minimum of 49 credits of course work and doctoral research and dissertation as follows:

1. A minimum of 18 semester credits of course work beyond the master's degree, including 6 semester credits of 7000-level course work acceptable to the student's advisory committee. Additional six semester credits of either graduate level course work or research work. No 5000-level courses are to be used to meet the minimum requirements of course work, and no directed study courses (XXX7980) are to be used to meet the 7000-level course requirement.
2. One hour of CS 6910 (graduate Seminar). If a student has already taken it as part of MS degree then he/she will not require to take it (in such case the total hour requirement for Ph.D. degree will be 48).
3. The equivalent of 24 semester credits of doctoral research and dissertation built upon the student's course of study and making a significant contribution to the state of knowledge is required; not more than 9 credits may be earned in a particular semester.
4. Residence of four semesters beyond the master's degree, with at least two semesters in continuous residence, is required. All requirements, including the dissertation, must be completed within a period of eight consecutive years.
5. Maintenance of a minimum quality point average of 3.0 and adherence to the general regulations of the Graduate School are expected.
6. All students in the program must follow a plan of study and research developed in conjunction with an advisory committee, satisfactorily complete a comprehensive examination, achieve candidacy, and satisfactorily defend the dissertation.

B. Student's Admitted Directly from the Bachelor's Degree

A student admitted with a bachelor's degree on exceptional basis, must successfully complete a qualifying examination based *mostly* on undergraduate materials before the end of the second semester of enrollment. This examination will be aimed at determining the student's mastery of the basic concepts in the discipline and the potential for successfully conducting research at the doctoral level. Based on the student's performance on the qualifying examination, the student may be (i) permitted to continue in the Doctoral Program, or (ii) advised to transfer to a MS Degree program in an appropriate discipline in the College, or (iii) recommended for termination from the graduate program of the College.

If permitted to continue in the doctoral program, the student, as described elsewhere in the catalog, will select a research advisor, form an advisory committee, and submit a program of study satisfying the following requirements.

1. The program of study should have a minimum total of 72 semester credit hours of academic work, consisting of course work and dissertation work, beyond baccalaureate work, subject to the following:
2. The program of study should include a minimum of 42 semester credits of appropriate graduate level course work consisting of a minimum of 6 semester credits at the 7000-level and a maximum of 9 semester credits at the 5000-level,

- acceptable to the student's advisory committee. It should also include an additional 6 semester credits of either graduate level course work or research work. No directed study courses at 7000-level (xxx7980) are to be used to meet the 6 credits of 7000-level course requirement.
3. A minimum of 24 semester credit hours of doctoral research and dissertation, built upon the student's course of study and making significant contribution to the state of knowledge, is required; no more than nine credit hours may be earned in a particular semester.
 4. The other requirements, such as residency, grade point average, comprehensive exam, and dissertation are the same as those for students admitted with a master's degree, as described in the catalog.

Advisory Committee

Each Ph.D. student's advisory committee will have a minimum of five (5) voting members with at least three members from the CS department and at least one (1) member from outside the department. The College of Engineering's Associate Dean for Graduate Studies and Research will serve as an ex officio, nonvoting member. The student is responsible for identifying, in consultation with the departmental chairperson and Associate Dean, a faculty member who is willing to chair his/her advisory committee. In consultation with the chairperson of the committee, the student is responsible for identifying the other faculty members required/desired and determining if they are willing to serve. Advisory committee is permitted to have more than the minimum number required. Normally one faculty member will serve as the chair. If the proposed research work is interdisciplinary, or if the initial chair retires, experiences health problems, or for some other cannot continue to perform all of the duties of the chair, the student may request that a co-chair be appointed. The request should be made in writing to the Associate Vice President for Research and Graduate Studies, via the Departmental Chair and the Associate Dean of Engineering for Graduate Studies and Research. If a student is not able to identify a sufficient number and type of faculty who are suitable and willing to serve on his/her advisory committee, the student will be advised by the Associate Dean that he/she should either change his/her area of research interest to more closely match those of the available faculty or consider selecting another major. Failure to be able to form a committee is a cause for transfer to non-degree status. Further regulations concerning the membership, appointment, and responsibilities of the advisory committee are given in other sections of the catalog, including the sections on "Organization of the Graduate School" and "Degree Requirements."

PhD Preliminary Assessment

It is recommended that new Ph.D. students in CS take the Preliminary Assessment of readiness for doctoral studies in their chosen field of research during their first semester of graduate study at TTU. A Ph.D. student must successfully complete this assessment by the midterm of their second semester in the PhD program.

The purpose of the PhD preliminary assessment is to:

1. Insure that the student possesses the knowledge and skills necessary for successful Ph.D. study and research.
2. Tailor a Program of Study for their future Ph.D. coursework to address any observed weaknesses, as well as to prepare the student to undertake independent research in their specific area.

Selection of a Ph.D. Advisor and Advisory Committee (1), Proposal of a research topic (2), Completion of the Preliminary Assessment (3), and Completion of the Program of Study (4) must occur by the end of the second semester of Ph.D. study. The student, in consultation with their Advisor, will form a Ph.D. Advisory Committee prior to taking the Preliminary Assessment. The Ph.D. Advisory Committee must include the student's Advisor, three other faculties in areas closely related to the proposed research topic, and one faculty from outside the CS Dept. (five members in total).

The Preliminary Assessment will consist of an oral presentation by the student to the Committee, followed by a period of oral and/or written questioning. The Committee will evaluate the strengths and weaknesses of the candidate in their chosen field of research and make an overall recommendation of pass or fail. A student will have two chances to pass, with only one attempt per semester. The Ph.D. student and the Advisory Committee shall meet for the scheduled Preliminary Assessment and complete the following tasks:

1. The Ph.D. student must give a short presentation to show his/her readiness for advanced Ph.D. study. The presentation should include:
 - a. A listing of and brief description of all background courses taken at the graduate level. This includes any 5000, 6000 and 7000 level courses taken at TTU, and any advanced courses taken at other institutions.
 - b. Prior research projects and activities in which the student has participated, including any publications or manuscripts that the student has developed and published.
 - c. A brief statement of the proposed topic of research.
2. The Ph.D. student should answer all questions from the evaluators clearly and accurately.
3. The Ph.D. student should present a tentative Program of Study for the Committee to tailor as needed.
4. The committee should prepare and ask questions pertaining to the student's strengths, weaknesses, and ability to perform independent research.
5. The committee should complete an evaluation form summarizing the student's strengths and weaknesses and make an overall recommendation of pass or fail. They should also provide suggestions to improve the student's proposed Program of Study.

At the end of questioning, the Committee will meet in a private session to assess the proposed Program of Study, and the student's suitability to continue in the Ph.D. program. The results of this Preliminary Assessment will be conveyed to the student and to the Associate Dean of Engineering for Graduate Studies in a memorandum from the student's Advisor, stating whether the student may continue in his or her Ph.D. studies at TTU.

PhD Preliminary Exam (for Direct Admission from BS)

If admitted with a Bachelor's degree (Direct Admit), a Ph.D. student must successfully complete a 4-hour written Preliminary Exam, by the end of their third semester of graduate study at TTU. This Preliminary Exam is similar in format to the non-thesis track MS comprehensive exam, covering the CS graduate core courses taken by the student, and requiring an overall score of 70 percent to pass.