GRADUATE STUDENT HANDBOOK

Department of Computer Science
Stony Brook University

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Contents

For further information about the graduate program in Computer Science visit our Web site at *http://www.cs.stonybrook.edu/* or write to *graduate@cs.stonybrook.edu*.
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1   Introduction

This handbook describes the requirements for admission to the graduate programs of the Department of Computer Science and the requirements to earn a graduate degree and all associated policies and procedures. The handbook also contains general information about the graduate programs. *Students in the Computer Science graduate programs are responsible for understanding the material in this handbook, the Academic Regulations, Procedures and Degree Requirements in the Graduate Bulletin, and the Graduate School Policy Manuals.* The latest Graduate Bulletin and Graduate School Policy Manuals are available on the Graduate School web site (*http://www.grad.stonybrook.edu*). Exceptions to the requirements to accommodate special circumstances must be approved by the student's academic advisor and the graduate program director. Such exceptions must be documented and included in the student's academic file.

2   Goals of the Programs

The Department of Computer Science offers an M.S. and a Ph.D. in Computer Science. The M.S. program is designed primarily to train students with professional goals in business, industry, or government, requiring a detailed knowledge of computer science concepts and applications. The program concentrates primarily on applied computer science, emphasizing software development, programming, computer systems, and applications. Each student is given the experience of working on a large scale software or hardware development project involving analysis, design, evaluation, and implementation.

The Ph.D. program is for students interested in obtaining academic or research positions in colleges and universities or in government or industrial research laboratories. The program gives students a rigorous and thorough knowledge of a broad range of theoretical and practical research subject areas and develops the ability to recognize and pursue significant research in computer science. The first two years of graduate study are devoted to coursework. By the end of the second year the research phase of the student's graduate career should be underway, with participation in advanced study and preliminary research work. The final years of graduate study are devoted to dissertation research. Upon entrance to the program, each student is assigned an academic advisor. Each Ph.D. student should seek a faculty member to serve as a research or dissertation advisor within the first two semesters in the program. The choice may be changed. However, each change of advisor may delay a student's progress. A research advisor is invaluable when it comes to issues such as financial support and progress through various examinations. Most faculty members have research groups, meetings and seminars by which a new student can become acquainted with the research being conducted in the Department. Please refer to Section 6.1 for the specific rules on choosing or changing an advisor.

A student who is progressing satisfactorily toward the Ph.D. can earn an M.S. degree as well. A student enrolled in the M.S. program can apply for admission to the Ph.D. program as described in Section 5.8.

3   Requirements for Admission to Graduate Study

Admission to the M.S. and Ph.D. Programs are handled separately by the departmental Admissions Committee. The requirements for admission to graduate study in computer science include:

A - Bachelor Degree: A bachelor's degree, usually in a science or engineering discipline or in mathematics, is required. The transcript should show a grade average of at least B (i.e., 3.0/4.0) in
(i) all undergraduate course work, and
(ii) in the science, mathematics, and engineering courses.

B - Basic Mathematics: Two semesters of college level calculus, plus a course in linear algebra. Also desirable is a course in either probability theory or probability and statistics.

C - Minimal Background in Computer Science: As a measure of this background the student must have at least an undergraduate level proficiency in 5 of 7 areas in Computer Science. These areas are the same as those in listed in Section 6.3.

D. Acceptance by the Computer Science Department and Graduate School.

E - GRE Examination. All applicants to the MS or PhD program must submit Graduate Record Examination (GRE) scores for the general aptitude tests. Applicants are encouraged to submit GRE test scores for the advanced examination in Computer Science as well.

Students of exceptional promise with non-standard background or or who lack certain requirements may be considered for admission to the program on a provisional basis. The student will be informed of the requirements that must be satisfied for the termination of the provisional status.

3.1 Transfers into the Graduate Program

We do not have a separate procedure for transferring into our graduate programs. An applicant must apply for admission into one of our programs as usual. This requirement is true even when the applicant is already a graduate student in another department in the university.

If admitted, an applicant *may be* able to transfer graduate credits from another university subject to the following rules:

- Only credits for bona fide graduate courses can be transferred. Graduate courses co-scheduled with undergraduate courses are not accepted.

- *No more than 9 credits* of graduate courses can be transferred. Students who took approved courses at Stony Brook can transfer up to 12 credits.

- In order to be counted towards graduation, the credits must be evaluated by one of our faculty members. The evaluation must establish an equivalence between a course being transferred from another institution to a Computer Science course in Stony Brook, which is accepted as part of the graduation requirements. The faculty member must be one of those who is teaching the corresponding graduate course on a regular basis.

- Graduate courses that do not meet the previous requirement can be transferred without being counted towards graduation. This can sometimes be useful because students who have earned 24 graduate credits of any kind need to be registered for only 9 credits (instead of 12) in order to have full status. Therefore, gaining this status early might reduce tuition liability.

4 General Graduation Requirements

The requirements for the completion of a graduate degree sometimes change. Students are bound by the requirements in this handbook that were in effect at the time of their admission to the program. They may be allowed to satisfy any subsequent set of requirements in newer versions of the handbook with the permission of the Graduate Program Director. In general, the student should keep abreast of the latest version of the Graduate Student Handbook, which is published on the Departmental Web site, and also the Graduate School Bulletin and Policy Manuals available on the Graduate School's Web site.

Students are expected to complete their degree requirements in Computer Science as expeditiously as possible. Also, the students must graduate once the minimum degree requirements are satisfied. Further, the students should only take Computer Science courses. Taking courses outside Computer Science (except English proficiency courses) is not encouraged and must be approved by the student's academic advisor and the Graduate Director.

4.1 Registration Requirements and Status

The status of a graduate student is defined as G1, G2, G3, G4, or G5. The first two, G1 and G2, refer to M.S. students and G3 through G5 to Ph.D. students. An M.S. student typically enters the graduate program with status G1 and a Ph.D. student enters with status G3. After completing 24 graduate credits the student receives the status G2 and G4, respectively. **Note**: *credits for incomplete courses are not counted towards the 24 credits required for the G2 and G4 status.* Ph.D. students who have been advanced to candidacy are designated as G5 (see Section 6.7). Students who enter the graduate program after obtaining a graduate degree or having completed 24 graduate credits at Stony Brook or at another institution in any discipline (not necessarily Computer Science related) can request G2 or G4 designation (whichever applies) from the Graduate School.

Students in the G1 or G3 status must register for 12 credits in order to have full-time status. The registration requirement for G2 and G4 students for full-time status is 9 credits. A G5 student should normally register for for 9 credits of dissertation research (CSE 699). If a student is performing research out-of-state he or she would register for 9 credits of CSE 700, and if the research is outside of the United States then the student would register for 9 credits of CSE 701. G5 students are permitted to take other courses that are directly relevant to the dissertation they are writing, but only with previous approval from their Graduate Program Director. In these cases the courses must all be graduate level (500 or above) and the total number of credits must equal 9. Still, at least three credits must come from CSE 699, CSE 700, or CSE 701.

Foreign students must be enrolled full-time throughout their course of studies in order to maintain legal immigration status.[1] Domestic students are not required to maintain full-time status, but they must register for at least one credit each semester. However, only full-time students are eligible for any kind of financial assistance. Also, part time students may not be eligible for living or working on campus.

An M.S. student (but not a Ph.D. student) can be considered to have full-time status in the last semester of studies even if he or she is registered for less than 9 credits. To obtain full-time certification, the student must be registered for the amount of credits that is sufficient to satisfy the graduation requirements. The certification is not automatic — the student has to submit a petition for an "underload" to the Graduate Secretary. Note that such an underload has a pitfall, which can seriously affect foreign students: The student cannot stay in the university past the semester in which an underload is granted. Therefore, failing any of the courses taken in this situation will put the student out of legal immigration status.

In addition, the following rules are in effect regarding Summer registration:

New students: New students who were admitted for full-time studies must register full-time during their first semester on campus. This means that summer admits must register for at least 6 credits for the summer session to which they were admitted. They do not need to register for Summer Session II if they have registered for Summer Session I.

Continuing students: Continuing students who have a GA or RA during the Summer are strongly encouraged to register for the summer. If no appropriate courses are available, students may register for 0 credits of CSE 800. The Graduate School advises this for reasons related to tracking federal grants, tax issues, and Homeland Security.[2]

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[1] Consult International Programs at the Graduate School regarding immigration and related legal issues.
[2] CSE 800 does not count towards any degree.

Graduating students: Students need to be registered for the semester they plan to graduate. The Graduate School permits Summer graduates to register for 0 credits. Graduates in other semesters must register for at least 1 credit. (International students must make sure that they are registered for enough credits to have full-time status.)

4.2   Taking Undergraduate Courses as CSE 587

A graduate student cannot earn graduate credits by registering for an undergraduate course using an undergraduate course number. Also, for a foreign student, registering for a course using an undergraduate course number may put a student out of legal immigration status and jeopardize any financial aid. However, an undergraduate course can, *with permission of the Graduate Academic Director and the instructor*, be taken using the course designation CSE 587 (Proficiency Requirement in Computer Science). To do so, a student should register for the section of CSE 587 which corresponds to the professor who is teaching the undergraduate course in question. Note the following points for the use of CSE 587:

- CSE 587 is only 2 credits, while the corresponding undergraduate course is 3 credits.

- The syllabus of the undergraduate course will specify *additional work* that graduate students must do in order to pass the course. Graduate students taking an undergraduate course under the CSE 587 number will be graded separately from the undergraduate students.

- A student may not use CSE 587 to take an undergraduate course when he or she has previously taken an equivalent undergraduate course (at Stony Brook or elsewhere).

- A *maximum of 2 CSE 587 courses* (i.e., 4 credits of CSE 587) for a specific set of CSE 300 level courses (see below) can be used to count towards the 31 credits of MS graduation requirement. (CSE 587 is not counted towards the Ph.D. course requirements.) To count towards the MS graduation requirement, however, the student must receive a grade of B or better.

  Only the following CSE 300 level courses can count towards the MS graduation requirement when done as CSE 587: Theory of Computation (CSE 303), Algorithms (CSE 373), Compilers (CSE 304), Languages (CSE 307), Architecture (CSE 320), Databases (CSE 305), Operating Systems (CSE 306), Networks (CSE 310), Graphics (CSE 328) and AI (CSE 352).

- The student may do additional CSE 587 courses, but they will *not* apply towards the graduation requirements, but will count towards the student's full-time status requirement.

Use of CSE 587 is not considered routine, and is considered somewhat of a special case. It is only to be used by students weak in one or more core area of computer science to get up to speed for graduate studies. Before registering for CSE 587 the student must use the form "Permission to Enroll in CSE 587" to petition the Graduate Academic Advisor and explain the reasons for taking CSE 587. The form is available from the departmental web site. If approved by the advisor, the petition must then be approved by the instructor.

Some Ph.D. students might also be advised by the Graduate Program Director to take an undergraduate course under the CSE 587 designation as part of their preparation for the Ph.D. qualifier and/or proficiency requirements. However, this is considered preparatory and CSE 587 is not counted towards the Ph.D. course requirements.

4.3   Grade Requirement

All courses ever taken in Stony Brook appear in the student's transcript and are used to compute the cumulative grade point average (GPA) on the trancript. This fact is important as the student sometimes may end

up taking courses that are not counted as a part of their degree requirement. This can happen, for example, due to the semesterly registration requirement for the full-time status. See Section 4.1.

To be certified for graduation, a cumulative grade point average (GPA) of 3.0/4.0 or better over all graduate courses is required by the Graduate School. This is regardless of whether all these courses are actually a part of the degree requirement. In addition, the Computer Science Department requires a cumulative GPA of 3.0/4.0 for the set of courses that specifically satisfy the M.S. or Ph.D. degree requirement in Computer Science. In case of a repeated course, the latest grade is used to satisfy the above requirement in the Computer Science Department. However, all courses still appear in the student's transcript, and all are still be used to compute the cumulative GPA on the transcript.

4.4 Curricular Practical Training

Some of the course credits required for the M.S. and the Ph.D. degrees can be satisfied with industrial internship. Due to government regulations related to work permits, international students must do internships through Curricular Practical Training (CPT) or Optional Practical Training (Section 4.5). *Note that internship or practical trainings are optional.*

CPT can be taken *only* in conjunction with a course, as specified below, and certain restrictions apply.

- *M.S. Program*: CPT can be taken in conjunction with CSE 596 (Internship in Research), CSE 523/524 (Advanced Project in Computer Science I and II), or CSE 599 (M.S. Thesis Research).

  - CPT can be taken in conjunction with CSE 596 *at most once*. The student must provide a detailed description (1-2 pages) of the duties to be performed as part of the internship and emphasize the educational value of the employment.
  - If CPT is taken in conjunction with CSE 523/524 or CSE 599, the work to be performed as part of the training must be an integral part of the student's M.S. project or thesis, whichever applies. The student must submit a detailed description (1-2 pages) of the work to be performed during the training and explain how it is integral to the project or thesis.

- *Ph.D. program*: CPT can be taken in conjunction with CSE 696 (Ph.D. Internship in Research) or CSE 699 (Ph.D. Dissertation Research).

  - CPT can be taken in conjunction with CSE 696 *at most twice*. The student must provide a detailed description of the duties to be performed as part of the internship and emphasize the educational value of the employment.
  - If CPT is taken in conjunction with CSE 699, it must be an integral part of the student's Ph.D. thesis work. The student must submit a detailed description (1-2 pages) of the work to be performed as part of the training and explain how it is integral to the dissertation research.

Whether CPT is taken in conjunction with CSE 596/696 or CSE 523/524/599/699, the aforesaid description of the work must be filed with the International Students Office after being endorsed by the student's project or thesis advisor, the employer, and the Graduate Program Director.[3]

On completion of CPT, the student should supply an evaluation letter from the supervisor at the place of internship, written on company stationery, which describes the work performed during the internship and evaluates the student's job performance. This letter will be kept in student's file.

Note: An international M.S. student is not normally allowed to participate in CPT unless (i) the student has completed two full regular semesters in residence, (ii) he/she is in good standing, (iii) has no incomplete

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[3] Procedurally, the student will bring the above form (endorsed by the thesis advisor and the employer) and the Graduate School's CPT application to the Computer Science Graduate Secretary. Upon checking the eligibility, the secretary will provide a cover letter and obtain the endorsement of the Graduate Director.

grades. One exception is when the CPT is directly part of the M.S. thesis or CSE 523/4 project and is certified as such by the student's advisor.

4.5   Optional Practical Training

This matter concerns only international students. International students are typically granted certain period when they can work in the U.S. during and after completion of their degree. This opportunity is known as Optional Practical Training (OPT). OPT is *not* part of the Computer Science graduate program. However, an international student who needs to take CSE 596 (Internship) can do so in conjunction with OPT, if for some reason this internship cannot be done as part of CPT. Please consult the specialists of the International Programs Department at the Graduate School regarding the rules governing the OPT option.

4.6   Controlling Course Load

Graduate courses and projects tend to require a substantial amount of work, so students are advised to plan carefully. For example, a graduate student with fewer than 24 graduate credits (a G1 student) must register for 12 credits to maintain full time status. He or she can make up the required number of credits in the semester by taking a combination of courses that may include CSE 523/524/599 (M.S. Project or Thesis – whichever applies), CSE 593 (Independent Study), or CSE 698 (Teaching Practicum) or 1-credit CS seminars. A program including more than four regular lecture courses in one semester is not advised.

5   Requirements for the M.S. Degree

Students in the M.S. degree program choose between three options:

- *Basic Project Option.* In this option, the students receive a broad coverage of Computer Science with at least one project-oriented coursework. The student must take 3 credits of CSE 522 (Basic Project in Computer Science) as a part of his/her graduation requirement.

- *Advanced Project Option.* In this option, the student undertakes a more involved, two-semester long project under the guidance of a faculty advisor. The student must take 3+3 credits of the two-semester long sequence of CSE 523/524 (Advanced Project in Computer Science I and II) as a part of his/her graduation requirement.

- *Thesis Option.* In this option, the student performs a research project under the guidance of a faculty advisor (usually 2–3 semester long), and writes a dissertation. The student must take 6–9 credits of CSE 599 (M.S. Thesis) as a part of their graduation requirement.

Regardless of the chosen option, the students are required to complete *a minimum of 31 graduate credits* in the Computer Science Department. However, the actual course requirements depend somewhat on the option chosen. Generally speaking, Advanced Project and Thesis Options provide more flexibility for course choices as the student may have to do a variety of different courses related to their project or thesis topics. The departmental web site has the updated list of graduate courses being offered to help students plan ahead. The required 31 credits must satisfy the following requirements.

1. *Breadth Requirement.* All students must satisfy the M.S. breadth requirement regardless of the chosen option. See Section 5.1.

2. *M.S. Project or Thesis (3, 6, or 9 credits).* This requirement depends on the chosen option. This requirement can be satisfied by taking 3 credits of CSE 522 (Basic Project Option), 6 credits of the CSE 523/524 course sequence (Advanced Project Option), or 6–9 credits of CSE 599 (Thesis Option).

3. *Computer Science Graduate Courses*. The remaining credits can be satisfied by taking Computer Science graduate courses at the CSE 500 and CSE 600 levels **with the following restrictions.** Note that *all* restrictions must be satisfied.

   - At most 2 credits can be counted from *all credits accumulated* in the following courses: CSE 593 (Independent Study), CSE 698 (Practicum in Teaching), CSE 596 (Internship in Research), 1-credit Seminar courses (CSE 640–661, but not CSE 600) and Special Topics courses.[4]
   - Advanced Topics courses (CSE 590/591/592/594/595 and CSE 690-692) can count at most 6 credits overall (i.e., up to 2 such courses).
   - There are further restrictions for the students in the Basic Project Option. For these students, any combination of the following courses can count at most 6 credits overall (i.e., up to 2 such courses). The courses are CSE 590/591/592/594/595 and *any course in the CSE 600 level*.
   - CSE 587 can be used. But specific restrictions apply. See Section 4.2.
   - No credits are counted for the CSE 600 Seminar course.
   - No credits are counted for courses specifically meant for Ph.D students (such as CSE 696, CSE 699).
   - Generally speaking, the student in one option cannot use project or thesis courses meant for another option for graduation credits. In other words, use of the courses such as CSE 522,523/524 and 599 are option specific. However, there is some flexibility. More about this in Section 5.6.

Relevant graduate courses in other departments can be used towards the 31 credits, *but if only approved by the Graduate Program Director*. To this end, the student must argue the case for taking a particular course by submitting a petition (e.g., arguing that such a course is needed for the student's project/thesis), which must also be endorsed by the student's project or thesis advisor. This is only applicable for students in the Advanced Project or Thesis Option. Students in the Basic Project Option cannot use any non-CSE course for graduation credits.

5.1 M.S. Breadth Requirement

Every student must satisfy the M.S. breadth requirement by the time of graduation regardless of the chosen option. The requirement is that the student must take *at least one* course in *each* of the following four areas.

1. Theory

   CSE 540: Theory of Computation

   CSE 548: Algorithms

   CSE 541: Logic

2. Systems

   CSE 502: Architecture

   CSE 506: Operating Systems

   CSE 533: Network Programming

   CSE 534: Network Fundamentals

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[4]Note that 'Special Topics' courses are different from 'Advanced Topics' courses. Special Topics Courses are those with course numbers in the range CSE 665–686.

3. Software I

> CSE 504: Compilers
>
> CSE 526: Programming Languages
>
> CSE 532: Databases
>
> CSE 537: Artificial Intelligence

4. Software II

> CSE 508: Network Security
>
> CSE 509: System Security
>
> CSE 528: Graphics

For the purpose of satisfying the M.S. breadth requirement, CSE 522 (Basic Project in Computer Science) will be treated as equivalent to the actual course the student attends. For example, if the student attends CSE 506 (Operating Systems) using the CSE 522 course designator, the student will be considered to have satisfied the breadth requirement in the Systems area. See more about CSE 522 in Section 5.3.

5.2 Project or Thesis Advisor

A student in the M.S. program opting for Advanced Project Option or Thesis Option must select a project or thesis advisor by the end of the *second* semester in the program. The role of the advisor is to guide the student through the M.S. studies, formulate a project or a thesis topic, and supervise the student towards the completion of the assigned task. The students in the Basic Project Option do not have a faculty advisor and the Graduate Program Director serves as the default advisor for such students.

5.3 Basic Project Option

Students in this option are required to register for "Basic Project in Computer Science" (CSE 522). The course designation CSE 522 is used to indicate a regular Computer Science graduate course that is heavy in projects. A set of such courses will be announced via the departmental web site as soon as the official course schedule is known for a semester. The student will actually attend one such project-heavy course (say, e.g., CSE 506 Operating Systems) along with the students who would ordinarily register for that course (e.g., CSE 506 in this example). When registering for CSE 522, the student must register for the section corresponding to the faculty member teaching that course (e.g., CSE 506 in this example).

The syllabus for the course will specify additional project work required of the students registered under CSE 522 designator. The students registering for CSE 522 must fill up an approval form (available via the departmental web site) and get approval from the instructor teaching the course. The approval form would be a part of the student's file. The student will not receive any credit for graduation for CSE 522 without such an approval on file. The student should seek this approval within the first week of classes in the semester he/she is taking this course.

5.4 Advanced Project Option

Students in this option are required to take the two-semester long sequence "Advanced Project in Computer Science I and II" (CSE 523/524) under the supervision of a Computer Science faculty member. The student registers for CSE 523/524 under the section of this faculty member. CSE 523 and CSE 524 must involve a single substantial two-semester long project under the same advisor, not two smaller projects with multiple advisors. Thus, switching project advisors implies that CSE 523 must be done a second time, and only one

such CSE 523 can be used for graduation credit requirements. CSE 523/524 must be taken in two different semesters and in that sequence.

Note that CSE 523 or 524 cannot be used for graduation requirements for students opting for the other two options. See also Section 5.6.

5.5 Thesis Option

In this option the student registers for 6-9 credits of CSE 599. The thesis must be approved by a departmental faculty committee of no less than three members chosen with the consultation of the thesis advisor. At the discretion of the committee, the student may be required to defend the thesis by presenting a departmental seminar on the topic of his or her thesis. The thesis approval/defense must be done before the deadline set by the graduate school for the student's graduating semester.

Note that CSE 599 cannot be used for graduation requirements for students opting for the other two options. See also Section 5.6.

5.6 Choosing an M.S. Option

In order to choose an option the students should carefully review their existing strengths and future goals. Students with a solid undergraduate background in Computer Science and/or good industry experience should normally choose the Advanced Project or Thesis Options. These options provide the opportunity for more in depth study in a direction of student's interest and the opportunity to work closely with a faculty member and his/her research group. The Basic Project Option is meant for students who simply likes to take a broad range of basic Computer Science courses. These would normally be the students who lack background on one or more core aspects of Computer Science due to the specific undergraduate preparation they have, or simply prefers to take range of basic courses instead of a more focused project or research. In the Basic Project Option, the minimum project experience needed for graduation is just one project-heavy coursework.

The student does not need to declare in advance the option he/she chooses. Thus, the student can switch between options. But planning ahead and sticking to one option would be in the best interest of the student. In any case, **at the time of graduation the student must clearly fall into one of the designated options.** Any additional courses the student may have done that is not appropriate for this option cannot be used for graduation credits. This means, for example, that credits for CSE 523/524 or CSE 599 cannot be used for graduation for a student graduating with the Basic Project Option. However, the following exceptions can be made.

- CSE 522 can be used as a regular Computer Science graduate course to satisfy the graduation credit requirements even for students opting for Advanced Project or Thesis Options.

- Swaps of credits between CSE 599 and CSE 523/524 are possible, but only if approved by the Graduate Program Director on a recommendation of the student's faculty advisor. This will typically be due to circumstances such as unforeseen changes in the scope of the project.

5.7 Independent Study

Students who wish to conduct research or participate in a project in connection with, or in addition to and separately from, the options described before can use CSE 593: Independent Study. This typically requires advance concurrence of a faculty member supervising the research/project. The student then registers for the section of CSE 593 that corresponds to that faculty.[5]

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[5] If the primary supervisor of the work is from a different department, the student must select a co-advisor from the Computer Science Department, who will be responsible for submitting the grades.

Note that although at most 2 credits of CSE 593 can be used towards the 31 credits required for the M.S. degree, students may register for additional credits of CSE 593 as appropriate. However, this additional credits cannot be used for graduation requirements.

5.8 Switching from the M.S. to the Ph.D. Program

An M.S. student who wishes to advance to the Ph.D. program must apply formally for admission to the Ph.D. program like any other regular applicant. They should have taken at least 4 Ph.D. qualifier courses before the application, and should have identified a faculty member who is willing to advise him/her. Once admitted to the Ph.D. program, courses taken in the M.S. program can be used for satisfying requirements for the Ph.D. program.

6 Requirements for the Ph.D. Degree

6.1 Dissertation Advisor

A student in the Ph.D. program must select a dissertation advisor by the end of the *second* semester in the program. The role of the *dissertation advisor* is to guide the student through the Ph.D. studies, help with selection of a research topic, and teach the art of doing independent and significant research. Students are encouraged to contact individual faculty members to discuss their research interests.

On selection of an advisor, a form must be filled out by both the advisor and the student, and submitted to the Graduate Director. Changing an advisor requires a new form. The student is expected to participate in research activities of the advisor's group and at the end of each semester (including summers, if the student is expected to work during summer semesters) the student is evaluated by the advisor. Two unsatisfactory evaluations in a row or three unsatisfactory evaluations in total will result in the dismissal from the program.

6.2 Ph.D. Qualifier

The purpose of Ph.D. qualifier is to ensure that the student has acquired an appropriate breadth in major computer science areas relevant to his/her research interest. The Ph.D. qualifier is based on taking graduate courses from the following three areas:

Theory:

    CSE 548: Algorithms
    CSE 540: Theory of Computation
    CSE 541: Logic
    CSE 547: Discrete Math

Software:

    CSE 504: Compilers
    CSE 526: Programming Languages
    CSE 532: Databases
    CSE 537: Artificial Intelligence

Systems:

    CSE 502: Architecture
    CSE 506: Operating Systems
    CSE 534: Network Fundamentals
    CSE 528: Graphics

Ph.D. students must take at least one course in each of the three areas, and a total of at least five courses (it is therefore allowed to take at most three courses in any one of the areas). Minimum passing grade for a qualifier course is A−. A student who fails to secure a passing grade will have to take another course not taken before, in the following semester. All qualifier courses must be completed within the first three semesters. We recommend students take at least two courses per semester, because most graduate courses are offered only once a year. No course substitutions, exchanges, or pleas for better grades will be accepted.

The makeup of the qualifier course groups and courses has been carefully chosen to balance breadth and depth.

6.3 Ph.D. Proficiency Requirements

To further ensure the breadth preparation, the Ph.D. students must satisfy a set of proficiency requirements. This requirement must be satisfied before the student takes the RPE (see Section 6.6).

The proficiency requirement may be satisfied at Stony Brook by completing an appropriate undergraduate course, taken as CSE 587, or an appropriate graduate course in each of the proficiency areas. Each may also be met by showing evidence of a similar course taken elsewhere at least at an undergraduate level, if approved by an instructor of the same course in Stony Brook. It is expected that for a well-prepared Ph.D. student the latter would be the most common mechanism to satisfy the proficiency requirements. The proficiency requirements, together with acceptable Stony Brook courses that would demonstrate that the requirement is met, are enumerated below:

1. Theory of Computation: CSE 303 or CSE 540.
2. Algorithms: CSE 373 or CSE 548
3. Language/Compilers: CSE 304, CSE 307, CSE 504, or CSE 526
4. Architecture: CSE 320 or CSE 502
5. Databases: CSE 305 or CSE 532
6. Operating Systems: CSE 306 or CSE 506
7. Networks or Graphics or AI: CSE 310, CSE 346, CSE 533, CSE 534, CSE 328, CSE 528, or CSE 537.

A set of forms is available in the departmental available for recording the student's satisfaction of proficiency requirements. These forms, appropriately filled with the requisite approvals, must be in the student's file before the student takes the RPE.

6.4 Research Proficiency, Thesis, and Dissertation Examination Committees

The purpose of the *Research Proficiency Examination (RPE) Committee* is to ascertain the student's preparation to undertake significant and original research investigation through the mechanism of the Research Proficiency Examination. The purpose of the *Thesis Committee* is to evaluate the student's Thesis Proposal and ascertain the progress towards the research objectives (see Thesis Proposal Requirement). The purpose of the *Dissertation Examination Committee* is to evaluate whether the student's dissertation meets the standards of the Ph.D. degree (see Section 6.11).

RPE Committee. The RPE committee must be formed by the end of the third semester in the Ph.D. program. It should include the dissertation advisor(s) and at least two other faculty members from the Department. The advisor(s) cannot chair the committee. The RPE committee **must be approved** by the Graduate School. To get the approval, the student must see the Graduate Secretary and submit the Committee Approval form at least **five weeks prior** to the examination.[6]

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[6] The Graduate School calls this the "preliminary" examination, so the committee approval form uses this term.

Thesis Committee. The Thesis Committee should include a least three members from the Computer Science Department: The thesis advisor(s), a committee chairperson (who cannot be an advisor), and another member (who is not an advisor). It may optionally include one or more members from outside of the Department or University. Typically, members of the RPE committee proceed to serve on the Thesis Committee.

Dissertation Examination Committee. The composition of this committee is the same as that of the Thesis Committee, except that the participation of an outside member is mandatory. Typically members of the Thesis Committee proceed to serve on the Dissertation Examination Committee.

Formally, the committee is appointed by the Dean of the Graduate School on the recommendation of the Graduate Program Director. The committee appointment form must be filled out with the Graduate Secretary at least **five weeks prior** to the defense.

6.5 Course Requirements

By the time of graduation, each student is required to accumulate at least 20 credits of regular lecture courses, internship, special topics courses or seminars. At most 5 credits of seminars and internship can be included in the 20 credits required for graduation; generic courses, such as CSE 593, CSE 587, CSE 600, CSE 698, and CSE 699, **cannot** be included. In addition, the following requirements should be noted:

- *M.S.-specific courses.* Students in the Ph.D. program may *not* enroll in CSE 522, CSE 523/524 or CSE 599. These courses are specific to the M.S. program.

- *On-going research seminar.* The student must register and complete two semesters of CSE 600 in their first year in the Ph.D. program. However, credits earned in this course cannot be used towards the 20 credits required for the Ph.D. program.

- *Internship, CSE 696.* At most two credits of Internship in Research can be counted towards the 20 credits required for the Ph.D. program.

- *Dissertation Research, CSE 699.* The Dissertation Research course can be taken *only* by Ph.D. students who have been advanced to candidacy (have G5 status). Prior to the advancement, students conduct research and participate in projects by taking CSE 593: Independent study. G4 students can register for up to 9 credits of CSE 593 in any semester. G3 students can register for only up to 3 credits of CSE 593.

- *Teaching requirement.* University policy requires that all doctoral students participate in an appropriately structured teaching practicum. This can be CSE 698 in conjunction with a teaching assistantship (TA) in the first year.

6.6 Research Proficiency Examination (RPE)

The purpose of the Research Proficiency Examination is to ascertain the student's preparation to undertake a significant original research investigation.

By the end of the third semester since admission into the Ph.D. program[7] an RPE Committee should be formed by each student and an agreement reached on a research project. The project should be described by a one-page abstract which is signed by the student and the Committee's members and submitted to the Graduate Program Director. The abstract should describe a research area and, as narrowly as possible, a problem in that area. A list of relevant publications should be attached to the abstract. With the approval

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[7] Excluding summers.

of the Committee a student may change the project description, but a change does not imply any deadline extension for taking the RPE.

The student will take the RPE within two years after joining the program as full-time Ph.D. students. The student must submit a report, written in the form of a conference paper, which critically evaluates and integrates the current state of research relevant to the problem described in the abstract and presents the student's progress in solving the problem. Reports based on previously published or submitted papers, or on papers in progress, are acceptable provided that they satisfy the aforesaid requirements.

The student will give an oral presentation to the Committee, describing the work, which will be followed by a session where the committee will ask questions. The oral presentation should be about 1 hour long. The report should be made available to the committee at least one week before the presentation is given.

Each aspect of the RPE (written report, oral presentation, responses to questions) will be separately graded by each member of the Committee using special forms provided for this purpose (available from the departmenal web site). The Committee as a whole can decide three outcomes: *pass, retake, fail*. A student who receives a grade of *fail* is dismissed from the Ph.D. program. A student who receives a grade of *retake* must retake the examination within 30 days. If, on retaking the examination, the student does not pass, the student is dismissed from the Ph.D. program. A student who receives a grade of *pass* has fulfilled the research proficiency requirement.

6.7 Advancement to Candidacy and G5 Status

Having passed both the qualifying examination and the RPE the student is advanced to candidacy. This status, called *G5*, is conferred by the Dean of the Graduate School upon recommendation of the Department. Note that unlike the change from G3 to G4, the change from G4 to G5 is not automatic — the student must request to be advanced to candidacy by notifying the Computer Science Graduate Secretary.

Students must advance to candidacy at least one year before defending their dissertations. In exceptional circumstances the Graduate Program Director may submit a written petition for a waiver of this requirement to the Dean of the Graduate School. The graduate school requires G5 students to register for 6 credits of which at least 3 must be for CSE 699, Dissertation Research. The remaining credits can come from either CSE 699 or other graduate Computer Science courses and seminars. Courses outside of the major require the approval of the dissertation advisor and Graduate Director.

Failure to complete the research proficiency examination within the specified time frame and obtaining the G5 status is considered evidence of unsatisfactory progress. In particular, *students whose status remains at the G4 level beyond 4 semesters since being admitted into the Ph.D. program will lose the tuition waiver and may be dismissed from the Ph.D. program.*

6.8 Research Assessment Meetings

All Ph.D. students who have not yet met qualifier requirements and passed their RPEs, or who do not have an advisor, will be reviewed each semester, in periodic *Research Assessment Meetings*. This review is conducted by the entire faculty, who votes on the future status of each student. This review is comprehensive, and includes at least the following items (in no particular order):

- Qualifier courses taken and passed with A− or better.
- All other courses taken, grades received, and GPAs.
- Progress in proficiency requirements.
- Performance as Teaching Assistant.
- Research productivity: publications, talks, software, systems, etc.
- Faculty input, especially from advisors.

- Student's own input.
- Cumulative history of the student's progress.

The outcome of the review will be a formal letter given to the student and placed in the student's folder. A student can be placed in one of two categories:

In Good Standing: The student has performed well in the previous semester and may continue in the Ph.D. program for one more semester.

Not in Good Standing: The student had not performed sufficiently well in the previous semester. The student may be placed under probation for one more semester, may lose RA/GA/TA funding, may lose an advisor, or may even be dismissed from the program immediately. Being under probation for two consecutive semesters will likely lead to dismissal.

In addition to the outcome, the assessment letter may also make specific recommendations to the student, as to what will be expected of the student in the following semester (e.g., pass 2 more qualifier courses, pass the RPE, etc.).

6.9   Thesis Proposal Requirement

After the student has completed all requirements presented earlier, and with the approval of the student's dissertation advisor, the student will present a thesis proposal. The purpose of the thesis proposal is to assess student's progress towards the Ph.D. thesis. The proposal must be submitted to the student's Thesis Committee within 18 months of the time that the student had passed the research proficiency examination. Failure to fulfill this requirement by that time without a formal extension may be considered evidence of unsatisfactory progress towards the Ph.D. degree.

The major requirements of the thesis proposal are as follows:

1. The student must be thoroughly familiar with the background and current status of the intended research area.

2. The student must have clear and well-defined plans for pursuing the research objectives.

3. The student must offer evidence of progress in achieving these objectives.

The student must be prepared to justify the effort to be expended in the research in terms of the value of the results expected, and to justify the extent and challenge of that research as evidence of research competence at the Ph.D. level.

The student will present the thesis proposal to the Thesis Committee in a seminar presentation. The presentation is not open to the general university community. It is limited to members of the committee, invited computer science faculty, and invited graduate students. Faculty members are free to question the student on any topics that they feel are in any way relevant to the student's objectives and career preparation.

Most questions, however will be directed towards verifying the student's grasp of the intended specialty in depth. The student will be expected to show complete familiarity with the current and past literature of this area.

The findings of the committee will be communicated to the student as soon as possible, and to the Graduate School within one week of the presentation of the proposal. If the committee finds the thesis proposal unsatisfactory, the student will submit an improved proposal, if such re-submission is approved by the Dean of the Graduate School.

6.10   Dissertation

An important requirement of the Ph.D. program is the completion of a dissertation which must be an original scholarly investigation. The dissertation shall represent a significant contribution to the scientific literature, and its quality shall be compatible with the publication standards of appropriate reputable scholarly journals.

6.11   Approval and Defense of Dissertation

The dissertation must be orally defended before a Dissertation Examination Committee, and the candidate must obtain approval of the dissertation from this committee. The oral defense of the dissertation is open to all interested faculty members and graduate students. The final draft of the dissertation must be submitted to the committee no later than three weeks prior to the date of the defense.

As mentioned on page 14, the student must submit a dissertation committee appointment form at least five weeks prior to the defense. In addition, four weeks before the defense, the student must fill out the Doctoral Defense Announcement Form (available from the graduate school's web site *http://www.grad.sunysb.edu*. This form must be sent to the Graduate Program Director by email; the director then forwards the form to the Graduate School, which makes a public announcement of the event.

6.12   Satisfactory Progress and Time Limit

A student who does not meet the target dates for the Ph.D. Qualifier, the Research Proficiency Examination, and the Thesis Proposal, or who does not make satisfactory progress towards completing thesis research may lose financial support. The candidate must satisfy all requirements for the Ph.D. degree within seven years after completing 24 credit hours of graduate courses in the Department of Computer Science at Stony Brook. In rare instances, the Dean of the Graduate School will entertain a petition to extend this time limit, provided it bears the endorsement of the Department's Graduate Program Director. A petition for extension must be submitted *before* the time limit has been exceeded. The Dean or the Department may require evidence that the student is still properly prepared for the completion of work.

6.13   Part Time Students

Students admitted into the Ph.D. program for part time study are bound by all the rules set out henceforth. In particular, part time students should adhere to the schedule for the Qualifying Examination, Research Proficiency Examination, and Thesis Proposal, as explained in Sections 6.2, 6.6, and 6.9, unless a different schedule has been approved in writing by the Graduate Director.

6.14   Obtaining an M.S. Degree on the Way to Ph.D.

A Ph.D. student who has completed the proficiency requirements, has passed the Ph.D. Qualifier and RPE, and has been engaged in at least one year full-time research beyond RPE, can apply for the M.S. degree provided that he/she has completed the 31 credits of requisite course work for the M.S. degree.

At most 9 credits of seminars (excluding CSE 600), special topics courses, or CSE 593 (Independent study) can be included in the required 31 credits. A student who has switched from the M.S. program to the Ph.D. program can in addition use the previously earned credits of CSE 523/524 towards the aforesaid 9 credits. These 9 credits together with the RPE are considered to be equivalent to the Thesis Option in the M.S. program.

The remaining credits required for the M.S. degree must be satisfied by taking technical graduate courses in computer science (*i.e.*, excluding courses such as CSE 523/524, CSE 587, CSE 593, CSE 596, CSE 599, CSE 696, CSE 698, CSE 699, seminars, and special topics).

M.S. degrees on the way to Ph.D. are awarded to Ph.D. students in good standing and who are making satisfactory progress towards their Ph.D. dissertation research, and are expected to complete the Ph.D. program. The student's dissertation advisor must attest to this via a letter.

7 Financial Support

First year Ph.D. students are generally supported on teaching assistantships; research assistantships are used to support continuing Ph.D. students. Some M.S. students are also supported in this way and a number of support opportunities in other university academic and administrative departments generally become available to Computer Science students each year. Assistants are assigned part-time duties in the undergraduate instructional program or in faculty-supervised research projects, but are still able to carry a full academic program. For a teaching assistant working 20 hours per week for the ten month academic year, the 2008/9 state rate for stipends is $12,276 plus tuition remission and health benefits. In addition, the Department often adds to the state rate for incoming students in the form of a supplement for the first summer. Thereafter, Ph.D. students are eligible for additional financial support through their research advisor. Research assistantships are typically valued at $7,500-$8,000 per semester.

Summer stipends are funded almost entirely by research grants, and the availability of such support and the amount of the stipend may vary from year to year and depend on the student's research area and advisor. Most of Summer stipends for Ph.D. students are funded at about $7,500-$8,000.

Assistants and fellows also receive tuition awards. Currently academic year tuition is $6,900 for the 12 credits for full-time graduate students who are New York State residents or $10,920 for out-of-state residents. Out-of-state residents who are able to do so (U.S. citizens and permanent residents) **must** become New York residents during the first semester of their graduate studies in order to remain eligible for tuition awards. A full tuition award covers 12 credits per semester until advanced status (G4) is assigned after completion of 24 graduate credits.[8] Thereafter the tuition award covers 9 credits per semester. Ph.D. students who reached the G5 status, must also register for 9 credits to be considered full-time. A student **must** be registered full time (i.e., for 12 or 9 credits, as appropriate) in order to receive tuition scholarship. Registering but not attempting a course (receiving the NR grade) is treated the same way as if the course was never registered for.

A G5 student should normally register for for 9 credits of dissertation research (CSE 699). If a student is performing research out-of-state he or she would register for 9 credits of CSE 700, and if the research is outside of the United States then the student would register for 9 credits of CSE 701. G5 students are permitted to take other courses that are directly relevant to the dissertation they are writing, but only with previous approval from their Graduate Program Director. In these cases the courses must all be graduate level (500 or above) and the total number of credits must equal 9.

In the health insurance scheme, N.Y. State pays 90% of the premium for single employees or 75% of family coverage. The state estimates this benefit to be about 12% of salary for single employees.

Renewal of financial assistance each academic year depends upon the student making satisfactory progress towards the degree, and satisfactory fulfillment of the duties and responsibilities of any assistantship. The University limits renewals of annual teaching assistantships to three after the first year, for a total of four years. Beyond the fourth year, support is dependent on financial aid other than university assistantships, such as research grants or fellowships. All offers and renewals of financial assistance are subject to Graduate School approval and the availability of funds.

All assistants who receive a stipend perform assigned duties in accordance with the following formulae: A student on a full assistantship devotes no more than 20 hours/week to his/her assigned duties during the

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[8] Graduate courses (even in a different discipline) completed at other universities may count, if appropriate documentation is submitted to the Graduate School.

academic year and 40 hours/week during the summer; A student on a fractional assistantship must give the corresponding fraction of full service each week.

A graduate student who is assigned to teaching duties (teaching assistant) is responsible to the faculty member in charge of the course to which he or she has been assigned. Duties will be specified by that faculty member and will usually include some or all of the following: lecturing to students on any subject pertinent to the course that will amplify the faculty member's lectures; answering student's questions concerning the course work; proctoring examinations; preparing solutions; grading of examinations; correction of homework assignments; supervision of laboratory sections; holding regular office hours. A document that describes the responsibilities of a teaching assistant appears on the Departmental Web site, *http://www.cs.sunysb.edu/*.

Students with teaching duties may register for CSE 698 (Practicum in Teaching) for up to 3 credits. The credits from CSE 698 do not fulfill department elective requirements, but do satisfy credit requirements for full time enrollment.

8 English Proficiency Requirements for Foreign Students

All students who are foreign nationals or have taken their higher education in a non-English speaking country must demonstrate proficiency in English. Admission to the Graduate School is contingent upon satisfactory fulfillment of this requirement. International students should request that the TOEFL or TSE scores be sent to the Foreign Student Office. All students must have a TOEFL score of 550 for admission, and all teaching or graduate assistants must have a TSE score of 240 **or** TOEFL score of 600. The award of a Teaching Assistantship will be contingent on the candidate's ability to speak English proficiently. All non-native English speakers will be required to pass a test of spoken English upon arrival at Stony Brook (the SPEAK test) before being assigned to classroom or other teaching duties. To be eligible for a teaching assistantship, a student must secure the score of 55 or higher on the speak test. Students who fail to achieve this score must take remedial courses ESL 591, ESL 596, or ESL 598 depending on their SPEAK test score. First year foreign students are advised to take full advantage of every opportunity to improve their fluency in English through frequent conversation with their American counterparts, and by enrolling in appropriate English language courses at Stony Brook.

Students on assistantship who cannot fulfill their obligations will fail to have their assistantships renewed; students who entered without support or with partial support will not be considered for full support the second year if they cannot assume the obligations of a teaching assistant.

9 Academic Standing and Probation

Students who do not maintain a cumulative graduate grade point average of 3.0/4.0 or better may either be *dismissed* or *placed on graduate probation* by the Department of Computer Science. *Students on probation may not be eligible for research, teaching or graduate assistantships.* A student on probation must bring his or her grade point average up to 3.0/4.0 within one semester (or 12 credits) after being placed on probation; otherwise, (s)he will be subject to dismissal by the Department of Computer Science. Satisfactory progress by a student will be determined by the requirements written in the Graduate Bulletin and this handbook in effect at the time the student entered graduate studies in the Department, or at the discretion of the student, from current editions of the Bulletin and Handbook.

10   Ethics

Students are expected to maintain the highest standards of ethical behavior. A computer science professional is in a position to develop products upon which the health, wealth, and well being of the entire society rests. Unethical behavior cannot be tolerated in both the workplace and in graduate school. The Department will severely punish a student who it determines has cheated on an examination, turned in project material or a homework that is essentially the work of another student, or invaded in any way another student's files without permission. Punishments include failure in a course, referral of the case to the Dean's Office or expulsion from the Department.

11   Incompletes and Petitions for Late Withdrawal from a Course

The Graduate School enforces a demanding and well-defined policy with respect to petitions for late withdrawal from a course.

After the 15th day of classes, no course may be added or dropped. Should it become impossible for a student to complete a course for a reason such as illness or accident, he or she may petition the Dean of the college for a waiver of the deadline. Such a petition must be approved by both the Chairman and the Graduate Program Director of the Department.

A petition for a waiver of the deadline can be approved *only* if one of the following conditions is met:

- Employment requires that a student be elsewhere at the same time that the class meets. This must be documented by the employer.

- Illness or injury prevents the student's attendance at the class. Since illness generally isn't selective and normally incapacitates a person equally for all courses, it would be expected that the student would withdraw for *all* academic work, unless special circumstances can be demonstrated.

The student must have a statement from the instructor affirming that he is in good standing at the time the petition is presented, and that he has been in regular attendance at classes and is up to date in all assignments.

The Graduate Program Director is bound by pledge not to send up a petition that does not satisfy the spirit of these requirements. Note that the Dean reserves the right to review and reject a weak petition.

It is the responsibility of the student to remain alert to the approach of the add-drop deadline if in doubt about his or her ability to complete the requirements for a course. The student should arrange a meeting with the instructor to determine whether requirement (3) above will be satisfied in case of a late withdrawal. Such a meeting would be indispensable for those classes where no exams and few homework assignments will have been given before the add/drop deadline date. Please consult the Graduate School Bulletin, the section on "*Academic Regulations and Procedures*," for additional regulations. The bulletin is available from the Graduate School's web site *http://www.grad.sunysb.edu/*.

Students who receive an "I" grade for a course must complete that course's requirements before the middle of the following semester or petition for an extension until the end of that semester. After that time, the "I" will become and "I/F" and completion of the course is no longer possible.