GEOSPATIAL COMPUTER SCIENCE DOCTORAL STUDENT HANDBOOK

Academic Year 2023-2024

COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

6300 Ocean Dr., Unit 5825, College of Engineering and Computer Science
Corpus Christi, TX, 78412
Phone (361) 825-2474
Website: https://www.tamucc.edu/programs/graduate-programs/geospatial-computer-science-phd.php

Date of Revision: August 28, 2023

This handbook is intended to be read in conjunction with the Graduate Catalog*: https://catalog.tamucc.edu/graduate/ and* College of Graduate Studies Doctoral Student Handbook*: https://www.tamucc.edu/grad-college/current-students/assets/documents/doctoral-student-handbook.pdf.*

THIS PAGE LEFT BLANK TO FACILITATE 2-PAGE PRINTING

TABLE OF CONTENTS

SECTION **PAGE**

This handbook is intended to be read in conjunction with the Graduate Catalog: https://catalog.tamucc.edu/graduate/ and College of Graduate Studies Doctoral Student Handbook: https://www.tamucc.edu/grad-college/current-students/assets/documents/doctoral-student-handbook.pdf.

SECTION I: GEOSPATIAL COMPUTER SCIENCE PROGRAM

Introduction

This handbook provides guidance to students applying for and enrolled in the Geospatial Computer Science (*GSCS) doctoral degree (Ph.D.) program at Texas A&M University-Corpus Christi (TAMU-CC). It contains information about the requirements for successfully completing the degree, the course of study, selecting an advisor and a graduate committee, choosing a dissertation research topic, admission to degree candidacy, the dissertation defense, and the final oral examination. This handbook should be used in conjunction with the Graduate Catalog: http://catalog.tamucc.edu and the procedures outlined in the College of Graduate Studies (CGS) Doctoral Student Handbook available at https://gradcollege.tamucc.edu/current_students/assets/doctoral_handbook.pdf. The GSCS Handbook outlines requirements specific to the GSCS program beyond what is described in those two documents. CGS policies and procedures take precedence over those in this handbook.

The CGS Doctoral Student Handbook also contains detailed instructions for preparing the dissertation manuscript. An updated version of this handbook will be published each academic year. As with the graduate catalog, the rules of the handbook that are in effect at the time of entry into the program will apply.

For purposes of this handbook, the historical program acronym, GSCS, will be used. The university website and CGS refer to the program as GSCM.

About a Ph.D. in Geospatial Computer Science (GSCS)

The GSCS doctoral program is an interdisciplinary program intended to train geospatially minded computer science scholars into accomplished researchers able to make significant contributions in geospatial computing. Students learn important fundamental theory in computation and geospatial science and apply it towards cutting-edge research in areas such as those listed below. The GSCS program is a unique combination of computer science and geospatial science able to position graduates as leaders in the field of geospatial computer science. For more information about the incentives of the GSCS program, please visit http://sci.tamucc.edu/academics/gscm-phd/index.html.

The **objectives** of the GSCS Ph.D. program are to:

- Develop students into experts in geospatial computer science.
- Train students to conduct and publish new research in geospatial computer science, including but not limited to such topics as big data analytics for geocomputation, autonomous systems, remote sensing, structure from motion photogrammetry, machine learning-driven geospatial knowledge discovery, mobile computing for location-based services, and high-performance computing for spatial optimization.
- Produce researchers who will be able to pursue careers in higher education, government, or industry related to or affected by geospatial computer science.

- Educate students in the collecting, processing, analyzing, and visualizing of geospatial data, as well as the utilization of geospatial methods and data for developing new technologies.
- Provide students with a rigorous preparation to use computer science theoretical and applied techniques to pursue research and scholarship that will advance the state of knowledge in geospatial computer science.

The **learning outcomes** for our graduates are to:

- Produce innovative research that advances theory or methodology in geospatial computing.
- Apply computer science and geospatial analysis skills to create new algorithms and applications for solving geospatial computing challenges.
- Develop the professional skills necessary to present research outcomes orally to a professional or general audience as well as in writing for peer reviewed journals and conference proceedings.

The GSCS Student

A prospective student who wishes to pursue the GSCS Ph.D. is expected to have adequate preparation in computer science, geospatial science, and mathematics. For computer science, this preparation must include successful completion of coursework in a high-level programming language. For geospatial science, students must have successfully completed coursework in geospatial data analysis and visualization. In mathematics, students are expected to have successfully completed coursework in calculus plus one additional junior level or higher mathematics course such as linear algebra, numerical analysis, or applied probability and statistics. Students admitted into the program without adequate preparation may be required to take leveling courses to fill knowledge gaps in the aforementioned areas.

The GSCS program welcomes students from backgrounds in computer science, GIS, geomatics engineering, and mathematics. Other science and engineering backgrounds with coursework in programming, computational methods, and/or geospatial science are also welcomed.

Graduate study provides advanced, specialized training that strengthens academic and professional competence by broadening scientific horizons as well as developing a specific expertise. Graduate students must assume greater responsibility and exercise more individual initiative than was necessary as an undergraduate. The graduate faculty emphasizes productive research, employ seminar methods more frequently, and anticipate class participation. To be successful in the doctoral program, students must display commitment to independent study, must become familiar with past and current research, and must relate ongoing research to the investigations of other scholars.

Geospatial Computer Science Program Staff

Michael J. Starek, Ph.D.
Coordinator, Geospatial Computer Science Doctoral Program
Professor of Geospatial Systems Engineering
NRC 3407, MANTIS Lab
(361) 825-3978, michael.starek@tamucc.edu

- Administer and support the GSCS program
- Collaborate with faculty on all issues related to the program
- Collaborate with graduate students to ensure their success

Chandra N Sekharan, Ph.D.
Department Chair and Professor of Computer Science
Department of Computer Science
CI 341
(361) 825-2478, chandra.sekharan@tamucc.edu

- Administer department that hosts the GSCS program
- Coordinate course scheduling and teaching assignments for faculty

Theresa Garcia-Ruiz
Academic Advisor, College of Engineering and Computer Science
Faculty Center, Rm. 222
(361) 825-4932, teri.ruiz@tamucc.edu

- Advise on program requirements
- Liaison for student with College of Graduate Studies regarding required documentation submission throughout degree pursuit
- Coordinate with student admission process

Schedule a meeting by email.

Menda Eulenfeld,
Administrative Associate III
CI 340
(361) 825-2474, menda.eulenfeld@tamucc.edu

- Assist GSCS coordinator and faculty
- Create independent studies and research courses for the GSCS students
- Assist GSCS students for travel arrangement and supply purchasing

List of GSCS faculty can be found at:
https://www.tamucc.edu/engineering/roster.php?program=gscs

Geospatial Computer Science Steering Committee

This committee oversees and initiates major program changes including to the degree plan and course requirements, student learning outcomes, and procedures and policies. Proposed changes require review, discussion, and a majority vote of approval by a quorum of GSCS core faculty members (see list above). Committee membership, presently, consists of five GSCS core faculty representatives as described below:

> Co-Chairs (2): one from Computer Science and one from Geographic Information Science/Geospatial Systems Engineering; Program Coordinator serves as one of the co-chairs and represents their home department.
>
> Members (3): one from Computer Science, one from Geographic Information Science/Geospatial Systems Engineering, and one from Department of Engineering.

2023-2024 Co-Chairs are Dr. Michael Starek (GSCS Program Coordinator, Professor of Geospatial Systems Engineering), Dr. Scott King (Professor of Computer Science).

Get Connected

Most official college and program information for students is distributed on listservs. Students should be automatically added to the GSCS student listserv upon enrollment. To ensure you are subscribed, students can manually join the "GSCS-student" listserv and other listservs by going to https://listserv.tamucc.edu/mailman/listinfo. All new and current GSCS students should ensure they are subscribed to the following listservs below:

List Address	Description
gscs-student@listserv.tamucc.edu	GSCS Students
coen-grad@listserv.tamucc.edu	College of Engr. and CS graduate students

SECTION II: ADMISSION DETAILS

GSCS Admission Criteria

1. Students seeking admission into the GSCS program must first identify a faculty member willing to serve as their graduate advisor. ***Applicants will not be admitted to the program without an identified graduate faculty advisor willing to advise the student once admitted into the program.*** Students can review the program faculty at https://sci.tamucc.edu/departments/computing-sciences/geospatial-computing-science/faculty.html and contact respective faculty in their area of research interest to discuss their willingness to serve as an advisor. Students can also contact the GSCS program coordinator for information about the program and suggested advisors.

2. Students seeking admission to TAMU-CC for graduate study must submit a complete admission application form, a nonrefundable application fee, official transcripts from all undergraduate and graduate coursework, and any additional documents as required by the program the student is applying to. All documents must be submitted to the Office of Recruitment and Admissions by the appropriate deadline. Visit the following two links for instructions on how to submit required documents:
   https://www.tamucc.edu/programs/graduate-programs/geospatial-computer-science-phd.php
   https://gradcollege.tamucc.edu/new_students/application_process.html

Application Form and Submission

To apply for the GSCS program, complete the online Apply Texas Application form found on the Geospatial Computer Science Ph.D. website at:
https://www.tamucc.edu/programs/graduate-programs/geospatial-computer-science-phd.php

Specific information on University criteria, application procedures, fees, and additional requirements for international applicants are found in the CGS Doctoral Student Handbook.

Program Specific Application Requirements

Below is a summary of supporting documents required by the GSCS program:

- Completed university graduate application form and paid application fee.
- Transcripts from regionally accredited institutions (international students will be required to submit relevant international transcripts).
- An essay (500 - 1,000 words) discussing why you are seeking admission to the program and what your research plans are.
- A curriculum vitae.
- Graduate Record Examination (GRE) scores that are no more than 5 years old.
- Three letters of recommendation.
  Send a recommendation request

Upload letter of recommendation

- Any relevant supplemental material such as resumes, cover letters, or previous publications.
- Applicants must indicate which faculty member has specified to act as the Applicant's graduate advisor.
- International students must submit TOEFL or IELTS scores and additional documents to the Office of Recruitment and Admissions. http://gradschool.tamucc.edu/international.htm

*To be considered official, all required postsecondary academic records must be submitted directly from the registrar's office and bear the seal and signature of the registrar of the institution. In some foreign countries, the controller of examinations or principal may certify academic records. Official English translations, not interpretations, are required from most countries.

A student entering the program is expected to have adequate preparation in computer science, geographic information science, and mathematics. For computer science, this preparation must include successful completion of coursework in a high-level programming language. For geospatial science, students must have successfully completed coursework in geospatial data analysis and visualization. In mathematics, students must have successfully completed coursework in calculus plus one additional junior level or higher mathematics course such as linear algebra, numerical analysis, or applied probability and statistics.

Students who have not successfully completed the above courses may be required to take leveling courses and/or additional course electives in any missing subjects to fill knowledge gaps. Leveling coursework does not count towards the total credit hours required for the degree. All leveling courses must be completed with a grade of "B" or better. While taking leveling courses, a student can take regular courses that can be counted towards the degree.

It is the student's responsibility to make sure that the application is complete by the deadline to assure full consideration. Acceptance into the GSCS Ph.D. program is competitive and based on consideration of all application materials. Students accepted into the program will typically have demonstrated an ability to succeed in an academically rigorous environment through high GPA and GRE scores. Relevant life experiences may also provide a substantial basis for consideration.

Application Deadlines

The GSCS has two types of deadlines: 1) priority deadlines and 2) last deadlines. All students should strive to meet the priority deadline because it is used to make decisions regarding funding or assistantships. All applications after the priority deadline and considered to be "late" applications fall under the last deadlines category. GSCS deadlines are the same for international and domestic students.

GSCS APPLICATION DEADLINES			
Domestic/International Students	**Fall**	**Spring**	**Summer**
Priority deadline to receive complete applications	April 30	August 1	Not Offered

Domestic/International Students	Fall	Spring	Summer
Last date for receipt of complete applications	July 15	November 15	Not Offered

Once the program is notified from the College of Graduate Studies that an application is complete, the GSCS program faculty review the application, hold a comment and discussion period, and then conduct a vote for admission or rejection of the applicant.

Upon acceptance or rejection, the student will be notified by the College of Graduate Studies.

Funding Opportunities

Teaching assistantships, graduate research assistantships, fellowships, or scholarships may be available to graduate students admitted as degree-seeking students who maintain full time graduate status. Funding applications can be found at https://gradcollege.tamucc.edu/funding/assistantships.html and must be applied to separately based on the funding opportunity. All materials requested for evaluation must be submitted to the office indicated on that form. For full consideration to opportunities, the deadline for submitting applications is February 1 for the following academic year. Admission to the program is decided separately from funding and students must first be accepted into the program before financial awards can be considered. Students can also refer to here for more information about funding: https://www.tamucc.edu/engineering/student-information/graduate-funding.php.

Teaching Assistantships

Teaching assistantships are available each year through the College of Engineering and Computer Science; see https://gradcollege.tamucc.edu/funding/assistantships.html.

The State of Texas requires international graduate students whose native language is not English to obtain English proficiency certification before serving as graduate teaching assistants.

Research Assistantships

A limited number of research assistantships are available to students through research institutes or centers, and individual faculty members; consult with the program coordinator, the institute or center directors, and individual faculty members (i.e, your identified advisor) to identify these opportunities. Some graduate research assistantships are administered through the College of Engineering and Computer Science by the GSCS program; refer to https://www.tamucc.edu/engineering/student-information/graduate-funding.php.

Eligibility

All students who hold assistantships must be enrolled as full-time students (at least 9 graduate hours during the fall and spring semesters, and 3 hours during the combined summer session) in the GSCS program. Appointments are for two full semesters (fall and spring). Reappointment requires reapplication each year, and students should not assume that the appointment will continue automatically. Summer assistantships may be available but must be applied for

separately. Check the CGS website for additional funding opportunities https://www.tamucc.edu/grad-college/funding/index.php.

Amounts

There is a consistent remuneration structure for all Fellowships and Assistantships that commensurate with education level and progress through the Ph.D. program.

Education Level	Monthly Stipend
B.S. and < 36 graduate hours	$1,600
M.S. or > 36 graduate hours	$2,000
Ph.D. Candidate (admitted to candidacy)	$2,200

Out-of-State Tuition Waiver

Graduate Assistants are eligible for a tuition waiver that reduces tuition and fees to Texas Resident rates. However, this must be for the semester in which they hold the assistantship appointment, must work in a half-time (20 hours a week) position, and maintain a course load of 9 credit hours during the fall and spring semesters and 3 credit hours during the summer semester to be eligible for a waiver. To apply for a tuition waiver, visit the College of Graduate Studies website at http://gradschool.tamucc.edu/funding/assistantships.html#teaching.

Cost of Education

Graduates wanting to estimate their financial commitment can visit the following website to evaluate potential cost of attendance:
http://gradschool.tamucc.edu//funding/cost_of_attendance.html

Doctoral Orientation

Orientation is available every fall and spring semester. For additional information on this event, please visit https://www.tamucc.edu/grad-college/orientation/index.php. A special orientation session is available for doctoral students upon request by the department/program coordinator.

Topics covered include:

- The College of Graduate Studies
- The big picture of doctoral degrees
- Getting to the doctoral degree

SECTION III: ACADEMIC PROGRESSION

Enrollment Status

All GSCS students are expected to be enrolled full-time, which is 9 hours during the fall and spring semesters and 3 hours during the combined summer session.

In addition, all GSCS students must follow University rules governing graduate studies including, but not limited to: residency, continuous enrollment, recency of credit, leave of absence, transfer credit, degree plans, grade point average, scholastic probation, enforced withdrawal, out-of-state tuition waivers, and the Texas 99-hour rule. All of these rules are described in the College of Graduate Studies Doctoral Student Handbook and can be found at: https://gradschool.tamucc.edu/current_students/doctoral_students.html.

Fulfilling GSCS Ph.D. Program Degree Requirements

Advancement in the degree follows two periods: pre-qualification and post-qualification. The progression to a degree consists of the following steps or milestones:

A. Pre-Qualification
   1. form a committee
   2. create a degree plan
   3. develop a research prospectus
   4. present prospectus to the committee
   5. develop a research proposal
   6. conduct proposal seminar
   7. pass comprehensive/qualifying exams

B. Post-Qualification
   1. conduct research
   2. write dissertation
   3. defend dissertation

Refer to **Appendix 3** for a checklist for fulfilling the degree requirements.
Refer to **Appendix 4** for the required timeline for completing the degree requirements.

Doctoral Program Forms

Each step of the progression in the doctoral program is accompanied by a requisite form, which is created and maintained by the College of Graduate Studies. Please use the checklist below for a timely submission of required forms. Always download the most recent version of the doctoral forms. These can be found at Graduate School Forms webpage: http://gradcollege.tamucc.edu/contact_us/forms.html.

In addition, the forms webpage also includes templates for the dissertation title page, copyright page, and committee member page.

All forms are submitted electronically on the College of Graduate Studies Forms webpage. At the bottom of the page, there is a link for uploading a file. Once uploaded, the file is forwarded to committee members and administrators for review, approval, and signature.

If you have questions or require additional information, contact the College of Graduate Studies at (361) 825-2177 or gradweb@tamucc.edu.

Directions: Please use the forms list below to ensure timely submission of required forms. These forms can be found at: http://gradcollege.tamucc.edu/contact_us/forms.html. *This webpage also provides a link for the student to submit the forms for electronic routing.*

Form	**Timeline**
Form A: Preliminary/Final Degree Plan Forms	9 months of entering the program
Form B: Comprehensive Examination and Advancement to Candidacy Report	36 months of entering the program for a M.S student, 48 months for a B.S. student
Form C: Doctoral Dissertation Advisory Committee Appointment Form	9 months of entering the program
Form D: Doctoral Dissertation Proposal Hearing Request Form	2 weeks prior to proposal seminar
Form E: Preliminary Agreement to Schedule the Dissertation Defense/Final Examination	8 weeks prior to graduation
Form F: Dissertation Defense and Written Dissertation Report	5 days following defense
Form G: Graduate Faculty Representative Report	5 days following defense
Form H: Doctoral-Dissertation Committee Member Change Request Form	As needed
Form I: Graduate Degree Plan Exceptions Form	As needed
Form K: Doctoral Request for a Leave of Absence	As needed
Form L: Catalog Change Request Form	As needed

Graduation Deadlines

You must submit a completed application for graduation to your academic advisor by the posted deadline. The application must be obtained and processed through your advisor.

In order to graduate, a series of deadlines must be met. These deadlines are posted by the Graduate School at: http://gradschool.tamucc.edu//current_students/doctoral_dates.html

Commencement

For dates, times and location of the commencement ceremonies please visit http://commencement.tamucc.edu/.

The Graduate Advisory Committee

After being accepted into the GSCS program and enrolling, the most important first step is forming the graduate advisory committee (GAC). In collaboration with their faculty advisor, students should select a graduate advisory committee to guide them through their degree program by the end of their first year in the GSCS program.

Together, the graduate advisory committee and the student prepare a degree plan detailing the coursework necessary for the student's program of study, select a dissertation topic and formulate a research plan. The graduate advisory committee also approves the dissertation proposal and final manuscript, and administers your candidacy examination and final dissertation defense/oral examination. Signed copies of the degree plan must be sent to the College of Engineering and Computer Science Dean's Office (Academic Advisor) and the College of Graduate Studies by end of the **second long semester**.

Composition and size of the graduate advisory committee should reflect the scope of the intended research and will be developed with the student's primary advisor(s). After the committee is formed, the student's primary faculty advisor will become the dissertation committee chair. Individual faculty members are under no obligation to serve on your committee or to be your committee chair. The decision not to serve should be based on some definable criteria such as work overload or incompatible research interests.

The graduate advisory committee consists of at least four members (at least 3 members for committees formed prior to 2021). Two members must be from the GSCS Ph.D. core faculty, including the committee chair. One faculty member must be a representative of the GSCS Computer Science core and one faculty must be a representative of the GSCS Geospatial Science core. A typical committee consists of 3 members from GSCS and 1 member outside of the GSCS faculty, but a minimum of two members must be from the GSCS core faculty as previously explained.

Additional members from outside the GSCS Ph.D. faculty may be approved upon discussion with their committee chair and the program coordinator, and be approved by the College of Graduate Studies. In exceptional cases, individuals holding graduate faculty rank at TAMU-CC or another accredited institution may serve as co-chair with the unanimous approval of the committee. In all cases involving the appointment of a non-GSCS Ph.D. faculty member, an associate graduate faculty status request accompanied by a curriculum vitae and a rationale for the appointment must be filed with the CGS and provided to the GSCS Program Coordinator. Once the committee is formed, Doctoral Form C (http://gradschool.tamucc.edu/forms.html) must be submitted to the CGS.

Upon submission, CGS will appoint a Graduate Faculty Representative (GFR) to the committee. The role of this appointee is to serve as an impartial member of the committee to ensure the integrity of University standards as they apply to the Ph.D. process. This member attends and participates in the oral portions of the proposal hearing and the final defense/oral examination.

The advisory committee chair supervises the student's dissertation research, including preparation of the dissertation manuscript. The committee as a whole approves the degree plan, research

proposal, and dissertation manuscript and administers the qualifying examination and final dissertation defense/oral examination. Beyond these functions, the chair and advisory committee members should serve as valuable mentors.

If possible, students should meet with their committee *by the end of the* ***first long semester*** *but* **no later than the end of the second long semester**. This first meeting is typically held when the student presents their research prospectus to the committee. The goal of the first committee meeting is to allow students to introduce themselves, present their research prospectus and ideas to the committee, and to finalize a degree plan. Students should remain in close contact with their graduate advisory committee during all phases of graduate study and dissertation research to keep them informed of progress and setbacks. At least annually, students must meet with their advisory committee to update the committee regardless of progress.

Students are responsible for calling required annual meetings of the committee and any other meetings deemed necessary by either the student or a committee member. The student is responsible for maintaining a written record of advisory committee meetings including conclusions reached. The student also submits all necessary paperwork and reports from the graduate advisory committee to the GSCS Academic Advisor and GSCS Administrative Assistant (submit to both individuals to ensure proper recording of your paperwork). Copies of meeting notes will be placed in your program file by the GSCS Academic Advisor and/or Administrative Assistant.

On occasions it may be necessary to replace a committee member or a committee chair. If such a situation arises, the student should consult his/her committee chair or the GSCS Program Coordinator immediately. The Program Coordinator and the other members of the committee will determine if a change is necessary. The removal or replacement of a committee member requires filing Form H, and agreement of the Committee Chair, Department Chair, and the Program Coordinator.

Should a dispute arise between a student and any committee member, the student should consult his/her committee

For any questions or help with forming the graduate advisory committee (GAC), reach out to the GSCS Ph.D. Program Coordinator.

Interactions with Other Graduate Students

Graduate education is not a solitary endeavor. Students must make opportunities to discuss their projects with other graduate students, and offer to assist others in the field or laboratory. Beyond generating camaraderie, this will give students a more comprehensive understanding of the many specific issues and problems in geospatial computer science, expose them to a broad array of research techniques, provide ideas for research problems, and provide opportunities to reciprocate in supporting each other.

Teaching Recommendation

Teaching a course as an Instructor of Record is not required for completion of the GSCS Ph.D. degree. It is recommended that all students in the GSCS Ph.D. program who intend to pursue a career in academia teach at least 3 semester credit hours as Instructor of Record during their tenure

as a doctoral student, usually after being admitted to candidacy. The rationale behind this is that many graduates will go on to careers in academia where teaching will be a major activity. However, even those who are employed outside of academia will likely be involved in education at some level and experience teaching will help to prepare them for those types of challenges in a competitive field. The course and timing of the teaching will be negotiated with the GSCS Program Coordinator, the chair of the student's advisory committee, and the appropriate department chair. International students must obtain English proficiency verification if English is not their native language prior to being assigned to teach (see CGS Assistantship Handbook or details).

Degree Requirements

The GSCS Ph.D. degree program consists of six components:

- Coursework
- Research prospectus
- Research proposal and seminar
- Qualifying examination (admission to candidacy)
- Dissertation
- Dissertation defense (research seminar and final defense/oral examination)

Throughout this process, there are three major decision points for the faculty. The first is admission to the program. An affirmative vote of the admissions committee indicates that the faculty believes you have the potential for advanced study. The second decision point occurs after a student has completed most of the required coursework (and any additional leveling coursework), and the graduate advisory committee administers a proposal defense then candidacy examination. The purpose of this step is to determine if the student has followed through by demonstrating potential for advanced study. After successful completion of the proposal defense and examination, a GSCS student becomes a Ph.D. Candidate. The third and final decision point comes when the student completes his/her dissertation. Successful defense of this work leads to the awarding of the Ph.D. degree in Geospatial Computer Science.

Coursework

Students entering the GSCS Ph.D. program with a bachelor's degree must take a minimum of 75 semester credit hours (SCH) beyond the bachelor's degree. Of those 75 SCH, students must take the GSCS core courses (12 SCH), one semester of Graduate Seminar (3 SCH), at least 27 hours of approved elective courses, and at least 30 hours of research and dissertation credits.

Students entering the program with a master's degree are required to take a minimum of 57 credit hours beyond the master's degree. Of those 57 SCH, students must take the GSCS core courses (12 SCH), one semester of Graduate Seminar (3 SCH), at least 9 hours of approved elective courses, and at least 30 hours of research and dissertation credits.

Students admitted to the program who are lacking foundational coursework in computer science, geospatial science, or math may be required to take leveling courses or additional electives to fill prerequisite knowledge gaps when admitted to the program through consultation with the GSCS Program Coordinator and their faculty advisor.

Please refer to the Graduate Catalog/Geospatial Computer Science for more details on GSCS coursework requirements: http://catalog.tamucc.edu/index.php.

Degree Plan

The graduate advisory committee will help you develop a degree plan that will aid in preparing you for your planned research. *The degree plan must be approved by the end of the second long semester by both the graduate advisory committee and CGS. To view the degree plan form visit: http://gradschool.tamucc.edu/forms.html (Form A).* Students who are unable to demonstrate proficiency in computer science, mathematics, or geospatial science may be required to take undergraduate or graduate leveling courses and possibly complete a master's degree prior to entry into the GSCS doctoral program. In most cases, leveling courses will not apply towards the total minimum credit hours required for the Ph.D. degree.

The *emphasis area* is a phrase that best expresses the student's intended focus within the broad field of geospatial computer science. Each student uniquely formulates an emphasis area based upon their academic interests, dissertation research topic, and guidance from their faculty advisor. There is no established list of emphasis areas from which to choose but these emphasis areas will be focused on the merging of computer science and geospatial science. Examples might be geospatial data analytics, machine learning, computer vision and remote sensing, autonomous systems, geocybersecurity, geocomputation, and others. Electives will normally relate to the emphasis area.

After the graduate advisory committee approves the degree plan, it must be filed electronically with the GSCS Academic Advisor and CGS. The easiest way to do this is file the form with the GSCS Academic Advisor. After a tentative degree plan is finalized, the graduate advisory committee and CGS must approve any changes or elective coursework if the courses are to be applied to the total semester hours required for the degree. Exception forms to document these changes can be found at http://gradschool.tamucc.edu/forms.html (Form K). Prior to graduation, your Committee Chair will circulate a final degree plan that includes any approved changes from the tentative degree plan to the student, advisory committee, College Dean, and Graduate Dean for final approval.

Course Load Requirements and Restrictions

Unless granted a leave of absence (in writing) by the Graduate Dean, all students are required to maintain continuous registration until all requirements for graduation from the GSCS Program are completed. **Continuous registration is defined as successfully completing 6 credit hours of advisor - or committee - approved coursework during each academic year (September-August). Students who fail to complete 6 hours in any academic year will be classified as inactive. Students who fail to complete at least 3 hours of approved coursework during the next full semester will be dropped from the program.** If you are dropped from the program, you must reapply for admission. In addition to continuous registration, *all students must complete a minimum of 9 credit hours each semester in two consecutive long semesters to meet the residency requirement.*

A graduate student may register for up to 12 hours of coursework in a regular semester, or up to 6 hours in a single summer session. Registration for a higher course load requires approval of the Dean of the College of Engineering and Computer Science.

The minimum number of hours required to define your enrollment status may depend on the requirements of any financial aid you receive. In general:

- GSCS Fellowships: 9 hrs each during Fall and Spring, 3 hrs during either 5-week summer session, or 3 hrs over 10-week summer session.
- Scholarships or Loans: varies, check with lending agency or entity granting the scholarship.
- Other Teaching Assistantships or Research Assistantships: 9 hrs each during Fall and Spring, 3 hrs during either 5-week summer session, or 3 hrs over 10-week summer session.

Graduate Seminar Course

All students in residence are required to complete one semester of GSCS 6302 Graduate Seminar (3 SCH) as part of the GSCS curriculum. This course should be taken within the first year of the student entering the program (Fall or Spring) dependent on when the course is offered. This course helps prepare the student for the rigors of conducting doctoral level dissertation research including ethics.

Student Seminars

All students must present a Dissertation Proposal Seminar to fellow students and their graduate advisory committee, preferably no later than their fourth full semester (Fall or Spring) for those entering with a master's degree and sixth full semester for those entering with a bachelor's degree. Refer to Appendix 4 for the program timeline.

All students must also present a Final Dissertation Research Seminar prior to the final dissertation defense/oral examination, which occurs after the seminar. See Research Proposal and Dissertation sections for more information.

Qualifying Examination and Admission to Degree Candidacy

To be admitted to candidacy for the GSCS Ph.D. degree you must:

- Have a cumulative GPA and a degree plan GPA of at least 3.0.
- Satisfy the residency requirement (completion of 9 credit hours in two consecutive long semesters).
- Have an approved dissertation proposal on file with the College of Engineering and Computer Science Dean's Office (Academic Advisor).
- Successfully conduct a proposal seminar and defense.
- Complete all formal coursework on the degree plan (excluding dissertation project research hours and GSCS 6999).
- Pass the qualifying examination.

You must be admitted to degree candidacy no later than 5 years after the first semester you enrolled in the program and at least 1 year before the date of the final dissertation defense/oral examination. CGS will not authorize a final dissertation defense/oral examination for any doctoral student who has not been admitted to candidacy.

After the completion of any required leveling courses and the GSCS Core Curriculum, all students must pass a Qualifying Examination to be admitted to degree candidacy. This examination may be scheduled when the student is within 6 semester credit hours of completing coursework (excluding dissertation project research hours and GSCS 6999) but must be completed after 12 and before 36 months of entering the program. Students entering with a BS should complete the exam before 48 months. If leveling work is not needed, students should complete the Qualifying Examination by the end of their second full year.

The student schedules the qualifying exam after completing the proposal seminar and defense. Taking the exam prior to conducting the proposal seminar and defense requires approval from the GSCS Program Coordinator and is not advised.

The Qualifying Examination involves written exams from each graduate advisory committee member, followed by an oral exam administered by the committee as a whole. Questions at the oral exam can cover any aspect of the emphasis area, any aspect of the written exam, and any other topic a committee member deems relevant.

Qualifying Examinations must be scheduled with proactive communication between the student and the committee. The written exams must be taken on no more than five consecutive days without approval from the GSCS Program Coordinator. Each participating committee member will prepare a written exam specifying the time (at least 4 hours, but no more than 8 hours), conditions, and questions for the exam. Requests for longer duration written exams, such as for an intensive data analysis and report format exam, can be allowed upon approved by the program coordinator. Each of the four days is set aside for a different committee member. The written exam is returned to the committee member who prepared it, graded as Pass or Fail, signed, dated, and returned to the graduate committee chair. The chair determines if the written exam is passed and puts the exams in the student's file (files it with the GSCS Academic Advisor). The written exam must be passed prior to taking the oral exam. The oral exam should be scheduled no sooner than one week after, but no later than one month after the written exams are completed. Students are advised to consult with each committee member well in advance to determine how to prepare to take the exams and to schedule the exam.

Exam schedules must be arranged so that all members of your advisory committee can be present. A written exam for a committee member can be administered by the committee chair with the chair's approval. The exam must be administered by the chair adhering to the time constraints and other stipulations (e.g., closed book) defined by the committee member. For oral exams, one committee member (but not the chair) may participate from remote sites via telephone or other media. Any member of the graduate advisory committee who must be absent should arrange with a member of the GSCS Ph.D. faculty from his or her department to sit at the examination as a substitute and should notify CGS, in writing, of the proposed substitution at least one week prior to the examination. In an emergency, the absent faculty member may clear the substitution with CGS by telephone, and follow-up with a written confirmation. Only one substitution is allowed. No substitutions for the chair of the committee will be approved. If a chair cannot attend a scheduled examination, or if two (or more) members of an advisory committee must be absent, the examination must be rescheduled.

The graduate advisory committee chairman will report the results of the examination in Form B (http://gradschool.tamucc.edu/forms.html) to the College of Engineering and Computer Science Dean's Office (Academic Advisor) and CGS signed by all committee members. This form must be submitted electronically to the CGS within 10 working days of the scheduled qualifying oral examination date and at least 14 weeks prior to the date of the final dissertation defense/oral examination. The committee may make recommendations for additional or remedial work as a condition for passing the exam. *If you successfully pass the Qualifying Examination, you will be advanced to candidacy at the beginning of the next semester provided all other criteria outlined above are met.. At that point you must complete all remaining requirements for the degree within 5 years.*

Individuals unable to pass the Qualifying Examination(s) will be dropped from the program. If you fail the Qualifying Examination, there is no obligation for a re-examination. At their discretion, the Graduate Advisory Committee may allow one re-examination when adequate time has passed to allow students to address inadequacies emerging from the first examination (not less than four months, but no more than six months). The advisory committee may request that the student retakes the entire exam or only those portions that were not passed, or the committee may recommend that the student complete a master's degree and be administratively withdrawn from the doctoral program.

Peer-Reviewed Publications

As part of the Ph.D. process, students are expected to generate peer-reviewed publications. This is important for your development as an independent researcher and future career goals in academia, federal agencies, or industry. By showing that your dissertation research has been accepted for publication through a peer-reviewed process, it validates the scientific value, novelty, and importance of your work. It further demonstrates to the graduate committee that your research has been reviewed by external domain experts and deemed worthy of sharing with the broader scientific community. This provides strong evidence to the committee in support of your dissertation defense. The standard expectation is that each Ph.D. student will have at minimum two peer-reviewed, full journal publications based on their dissertation research prior to graduating with an additional publication in development or review. This number is provided only as a guideline, and each student's case will vary dependent on guidance from their chair and dissertation committee. Peer-reviewed conference proceedings papers are also of value in the computing fields. The publication process from first submission to final publication can sometimes take up to a year or longer. A recommended timeline for peer-reviewed publications is as follows: by end of Year 3, your first publication should be accepted. Prior to your final defense, your second publication should be submitted and accepted (or in revision).

Presenting research at scientific conferences is an important part of student development and growth. All students are encouraged to attend and present their research at scientific conferences. A certain amount of travel funding is allotted each year to the GSCS program to support student travel to conferences. Reach out to the GSCS program coordinator for more information.

GSCS Program Coursework Requirements

A. Admission from a Bachelor's Degree Option (75 semester credit hours)

Course	Title	Semester Hours
GSCS 6302	Graduate Seminar	3
	Core Coursework	12
	Elective Coursework	27+
	Research Coursework*	30+
GSCS 6999	Dissertation Defense*	3-9
	Total	**75**

B. Admission from a Master's Degree Option (57 semester credit hours)

Course	Title	Semester Hours
GSCS 6302	Graduate Seminar (1 sem. hr x 3)	3
	Core Coursework*	12
	Elective Coursework	9+
	Research Coursework*	30+
GSCS 6999	Dissertation Defense*	3-9
	Total	**57**

***At least 30 hours of research and dissertation credits must be taken and will come from the following courses: GSCS 6996 Research (prior to candidacy), GSCS 6998 Dissertation Research (after being admitted to candidacy), GSCS 6999 Dissertation Defense.

GSCS Core Curriculum Coursework

All students must master the same core knowledge, and this content must be mastered prior to their candidacy exam. The core knowledge can be mastered with the following courses.

- COSC 6334 - Design and Analysis of Algorithms 3 sem. hrs.
- COSC 6380 - Data Analytics 3 sem. hrs.
- GSCS 6321 - Geospatial Data Structures 3 sem. hrs.
- GSCS 6331 - Advanced Geospatial Computing 3 sem. hrs.

Students entering with a master's degree must take at least three (9 SCH) of the above courses at Texas A&M University-Corpus Christi, and in most cases, will be required to take all four courses. For a transfer of credit to replace a core course, a student must demonstrate verifiable equivalency of their master's degree course by showing that it is a near-exact equivalent to the respective core course, was administered in a rigorous format, and receive formal approval from the GSCS Program Coordinator and GSCS Academic Advisor. This process requires a form and the student must reach out to the GSCS Academic Advisor and Program Coordinator to initiate the process.

GSCS Elective Coursework

At least 27 hours of electives must be taken by students entering with a bachelor's degree, 9 hours of electives by students entering with a master's degree. Electives will predominately come from COSC, GSCS, and GSEN graduate courses. Up to 6 hours can be from another graduate program with approval. COSC, GSCS, or GSEN courses not shown on the list of standard electives for the GSCS degree can be taken with approval.

For a list of all core and standard elective courses, please refer to the current GSCS catalog at: https://catalog.tamucc.edu/preview_program.php?catoid=25&poid=3419.

Research Prospectus and Proposal

The GSCS program strives to give doctoral students comprehensive knowledge in their professional fields as well as training in the methods of research. Students must conduct novel research related to the field of geospatial computer science and GSCS program goals. A student's dissertation research must demonstrate a merging of elements from computer science and geospatial science although the degree to which those two elements are merged will vary from student to student. Development of a student's dissertation research is done in close coordination with their dissertation chair/advisor and the graduate advisory committee. Many classes will require you to write research proposals and/or peer-reviewed publications as part of the graded class assignments. Original research and the publication of results are an obligatory part of any Ph.D. program.

The required dissertation involves an independent, detailed research project of importance to the international scientific community. The student's graduate advisory committee will guide the conception, design, construction, and execution of a systems-based inquiry and will review and approve the dissertation manuscript. Normally, an edited version of the dissertation or chapters comprising the dissertation will be published. Your graduate advisory committee may require such publication as part of the defense process.

Research Prospectus

The doctoral student, along with their graduate advisory committee, designs and plans the dissertation research project. ***This plan must be formalized in a "Prospectus," a brief 3-5 page maximum document (including references) summarizing the motivation, goals and methods of the student's intended research project, as well as the expected benefits or outcomes.*** The Prospectus is a prologue to the formal Research Proposal and must be presented to the graduate advisory committee at an early meeting (by end of your first year in the program). The prospectus meeting provides an opportunity for the student and committee to meet and interact, learn about the student's intended research direction, and provide initial feedback.

The Introduction to the Prospectus should briefly explain the area of interest and scholarly motivation for the research. Some clearly stated research objectives should also be listed. The Prospectus should provide an overview on the proposed approach/methods to be explored to accomplish the research and conclude with expected contributions. Students can reach out to their faculty advisor and the GSCS Program Coordinator for examples of prospectus from former students.

The Prospectus will be submitted, along with the degree plan, to the College of Engineering and Computer Science Dean's Office (Academic Advisor), no later than the end of the second long semester (Fall/Spring) of the first academic year. There is a one semester grace period.

Research Proposal

The proposal should be concise and provide a compelling rationale for the proposed research. The proposal must include a brief but complete synthesis of previous research on the problem, the significance or novelty of the research (critical), and a detailed plan (experimental protocol) for carrying out the research and eventual analysis of the results. The proposal must also include a timeline with distinct milestones to guide the student and the advisory committee in assessing progress, as well as an estimated budget (included in the Appendix) to conduct the research. The proposal should be approved by the advisory committee prior to beginning substantial research, and normally will be completed by the end of the second year, or beginning of the third year at latest, for those entering with a master's degree and by end of the third year, or beginning of the fourth year at latest, for those entering with a bachelor's degree.

The proposal should be prepared in the style of a relevant peer-reviewed journal. A dissertation proposal should include the following sections, and in a same or similar order:

1. Title page. See example of a correctly spaced and formatted title page below.
2. Project Summary. Like an abstract, the Summary should be a synopsis of the proposed activity suitable for publication and not more than one page in length. It should describe the activities of the project. The Summary must clearly address, in separate statements, the two merit review criteria that are used by national science programs: 1) the intellectual merit of the proposed activity; and 2) the broader impacts resulting from the proposed activity.
3. Background & Relevance. This section summarizes the available scientific literature related to the problem or topic and explains why the proposed research is necessary.
4. Study Purpose, Objectives and Hypotheses. This section explicitly states the purpose of the research project (e.g., to develop generalizable deep learning architectures for enhancing satellite imagery spatial resolution and spectral resolution). The purpose should reflect the question(s) that the research hopes to answer, not the method used to conduct the research. The objectives provide the steps in the research (not explicit methods) that will be used to answer the question (e.g., to gather high resolution and multispectral resolution satellite imagery over areas of varying land cover). Hypotheses provide the explicit questions and predictions that will be tested in order to answer the larger research question (e.g., what are the most efficient architectures for achieving accurate super resolvance predictions from low resolution image sets?).
5. Data Sets and Study Site (if applicable). Description of data planned to be collected and analyzed. If field research is planned, then a description of the study area including a map must be included. The study site should be briefly characterized. For some research, this section may not be relevant.
6. Methods. This section describes in detail the methods of data collection and analysis you will use to meet each research objective or hypothesis. This is arguably the most important part of the proposal. Be sure and include how and when you will obtain any necessary permits.
7. Intellectual Merit and Broader Impacts. This section describes the anticipated scientific contributions relative to the current state of literature in the field of geospatial computer science, or what the National Science Foundation (NSF) refers to as "the potential to

advance knowledge". NSF defines broader impacts as "the potential to benefit society and contribute to the achievement of specific, desired societal outcomes."

8. Timeline. The timeline should be a table that includes distinct milestones showing the schedule for both research and academic work. Milestones should include completion of coursework, preliminary examinations, data-gathering for each objective or hypothesis, and analysis of each objective or hypothesis, writing of dissertation, submission to committee, and graduation.
9. Literature Cited. This section includes the complete citation for each article referenced in the proposal in the format of the format journal you have selected.
10. Budget. The budget should reflect a reasonable estimate of the expenses that are anticipated to be incurred during the research project and by whom they will be paid. Include financial or other support obtained from all sources. Include the budget in an Appendix at the end of the proposal. Divide the budget into 4 subsections and present it in tabular form.
    1. Equipment. Include cost figures for each piece of non-expendable equipment that you must purchase to support your research. Do not include purchase costs for equipment already available for use at TAMU-CC, but make sure that such equipment is operational and available for your use. Obtain permission before using University equipment and expendables.
    2. Supplies. Estimate costs for all supplies expected to be exhausted during your research project including replacement costs such as batteries, computing costs, etc.
    3. Travel. If field work is involved, include cost estimates for data collection including travel and other expenses.
    4. Preparation of Documents. Include costs for journal publications or other anticipated publication expenses.

    Budget Justification. This comes after the budget table. It is a brief statement explaining why each element of the budget is necessary to accomplish the research.
11. Biographical Sketch. The vitae must be 2 pages or less in length and should include five sections: 1) name, present address, contact information, and date; 2) Professional preparation including degrees listing most recent first; 3) Appointments to employment positions, listing most recent first; 4) Publications listing most recent first; and 5) Synergistic Activities, e.g. professional associations, presentations, professional activities, or any other relevant service.

After the proposal is completed and approved by the committee chair, i.e., it is written well, formatted correctly, and has addressed all required revisions and edits from the chair, a draft copy is provided to the graduate advisory committee. After preliminary approval by the committee, the student should arrange to formally present the proposal in a public seminar. This presentation will clarify objectives, justification, methods, logic, or the proposed research and provide project orientation. The student and the graduate advisory committee must plan the timing, location, and format of the Dissertation Proposal presentation and the student must make a public announcement (see example at the end of this section) so that any interested persons may attend. All members of the committee should be present. The dissertation defense/final oral examination will not be permitted until this requirement is met.

Writing a successful proposal may require many drafts prior to approval by the entire advisory committee. Starting this process early is strongly advised. After the proposal meets the committee

chair's approval, each of the remaining committee members should be provided a copy for review. After all requested changes have been made and the committee is satisfied that all aspects of the proposal are in order, the final Dissertation Research Proposal must be delivered to the committee chairperson for his/her signature and then to the rest of the committee and Program Coordinator for signatures.

Once all signatures are obtained, make copies to distribute to all members of the graduate advisory committee, and to the College of Engineering and Computer Science Dean's Office (Academic Advisor). Students must take this process into account when planning their research schedule.

Preparing the Research Proposal

Make all narrative material of the dissertation proposal clearly understandable to the reader through careful, well-organized writing, meaningful figures and tables, and adequate utilization of references. Several publications available in the TAMU-CC library answer specific questions regarding the style of scientific writing, including the Council of Science Editors (CSE) Style Manual, the United States Government Printing Office Style Manual, and others. No corrections of letters or figures should be visible on the final copies.

When writing the dissertation proposal and dissertation, follow the general format and style for submitting manuscripts ("Guide/Instructions for Authors") of a respected scholarly journal in the field of your research. However, you ***should not follow*** the final style of journals such as the use of double columns on a text page, literature citation methods other than the name-date system, etc., nor can the typed manuscript duplicate every printing technique. Do not follow the journal's "Instructions to Contributors" except with regards to formatting headings and subheadings, figures and tables, figure and table captions and text callouts, abbreviations, etc. These instructions are primarily for the convenience of the editors and printers of the journal and do not necessarily apply to the format of dissertation proposals or dissertation manuscripts. The journal that you choose as the "Format Journal" for your graduate manuscript must be readily available in the TAMU-CC library. Your committee must approve your Format Journal choice before you begin to write the manuscript. It is usually a good idea to use the same Format Journal for both the proposal and final manuscript.

Prepare the manuscript using styles in your word processor. Styles allow you to reformat the document quickly. The font should be 10 or 12 characters-per-inch (cpi) type size with a plain book-type font such as Helvetica or Times Roman, not some unusual font. Follow your format journal in italicizing or underlining scientific nomenclature, foreign words, abbreviations and titles. When underlining a word, use a continuous underline; do not leave a space in the underline between letters. Separately underline each word of a multiword term, leaving a gap between adjacent words. In general, double-space your dissertation proposal and dissertation manuscript. The exceptions to this rule are for quotations exceeding six typed lines (inset and single-space these) and footnotes (which you should avoid). Figure and table captions should also be single-spaced. One line should separate a table caption from the table header and two lines should separate any embedded figure or table from text on the same page. Number all pages in the dissertation proposal or dissertation manuscript except the Title and Approval pages. Number the preliminary pages of the dissertation proposal with lower case Roman numerals. The Abstract page is the first numbered page; it follows the Title and Approval pages and is numbered iii. The style and format

for all headings and subheadings in the dissertation proposal and dissertation manuscript should follow the standard practice of the format journal. Start each major heading (i.e., Methods, Study Area, Results, Discussion, etc.) on a new page. Subheadings should fall naturally within the text, but should never appear alone as the last line on a page ("orphan"). If a subheading is the last line of text, start it at the beginning of the next page. Always refer to the graduate school and dissertation template document for

Tables and figures, regardless of size, may appear on separate pages or within the text itself. Place them in the manuscript as close as possible to their first reference in the text (generally the page on or immediately following the first reference). Make sure that figures and tables are relevant and useful to the reader, and use as many as are necessary to fully report on the results of your research. If a figure or table is relevant, but represents ancillary information or "raw" data, include in an appendix rather than in the main text of the manuscript. If you place tables or figures in landscape format on a page, the top of the table or figure should be on the left side. Give each table or figure a number and caption, and transcribe these exactly on the List of Tables or List of Figures page; if a figure or table caption is more than one sentence, then put only the first sentence into the list. Make captions as concise as possible, but clearly describe the content of the figure or table. Follow exactly the format and style for figures and tables prescribed by the Format Journal.

Construct tables using the "Table" function found in all word processors. Titles for tables must appear on the same page as the table, and should be placed above the table. Make horizontal rules mimic the Format Journal. Vertical rules should not be used. If a table is more than one page long, there should be no closing line on the first page and the second page of the table should have a caption reading "Table #. Continued." Multi-page tables should always begin on a new page; in other words, the first few lines of a multi-page table should not appear embedded within the text. Use the caption style of your word processing program for figures, which usually places the caption below the figure.

Footnotes should not appear within the regular text of the manuscript (they are permissible as explanatory notes in tables) except in rare circumstances. If they are absolutely necessary and the Format Journal permits their use, follow the journal format exactly. Cite all references to the literature in the text using the name-date system which is the method most widely used in the sciences, e.g., Stilt (2000) or (Heron, 1995; Seagull 1996; Seagull and Plover, 1996). Choose a Format Journal that uses this system. Do not cite sources by number, i.e. (1). If you use or adapt a figure from another author, cite the source in the figure caption. Generally, follow the format in the Format Journal when you develop the Literature Cited section. Use the same system of abbreviations, punctuation, underlining, and italics as the Format Journal. There is one exception (mainly applies to chemistry Format Journals): if the Literature Cited section of your Format Journal does not list the title of an article, make sure that you include it to enhance the usefulness of your citations to readers.

A dissertation template in WORD and LaTex format is provided by the College of Graduate Studies (CGS) and can be found at the following link: dissertation guidelines and templates**.** It is recommended, though not required, that you utilize the dissertation template in preparing your proposal because it is required to be utilized for your final dissertation document. Always confer with your advisor concerning proposal format.

Research Proposal Seminar

Once the advisory committee has approved the research proposal and a date for the Dissertation Proposal Seminar has been set, the student must submit Form D: Doctoral Dissertation Proposal Hearing Request Form (available at http://gradschool.tamucc.edu/forms.html). This form has to be submitted with original signatures to the College of Graduate Studies no later than two weeks prior to the hearing (seminar) and, at minimum, two semesters prior to the student's anticipated graduation. A Research Proposal Seminar Announcement (see example below) should be sent to the appropriate listservs no later than 1 week before the seminar date.

Format of the Research Proposal Title Page

TITLE SHOULD APPEAR IN ALL CAPITALS AND BE CENTERED
a research proposal prepared by YOU A. STUDENT
MONTH, YEAR

for
The Graduate Committee
Geospatial Computer Science Program
College of Engineering and Computer Science
Texas A&M University-Corpus Christi
Corpus Christi, Texas

Approved:

_____
Dr. A. Shell, Chairperson

_____
Dr. B. Waves, Member

_____
Dr. C. Gull, Member

_____
Dr. D. Sand, Member

Format: *Title of Journal* used as format.

Format of the Research Proposal Budget and Budget Justification

Table 1. Proposed budget for dissertation research

Budget Item	Costs ($)			
	TAMU-CC	Personal	Other	Total
*Salary				
Monthly (15 months)			15000.00	15000.00
Equipment				
Desktop	on hand/no cost			
Laptop		on hand/no cost		
Drones	on hand/no cost			
Supplies				
Flash lidar	2000.00			2000.00
Digital RGB cameras	1000.00			1000.00
Travel				
Boat/Vehicle (4 trips)	100.00	500	400.00	1000.00
Food			100.00	100.00
Hotel			200.00	200.00
Preparation of Documents				
Journal costs	2000.00			2000.00
Total	5100.00	500.00	15,700.00	21,300.00

* Salary is not required but it can be included

Also include a section entitled "Budget Justification" that briefly justifies the budget expenses outlined in the budget.

A budget should be prepared for things like anticipated software fees, publication submission fees, potential costs for data collections, sensor costs, etc. Any equipment or computing costs must be within reasonable amounts and are at the discretion of available funding, project resources, and should be put forth in consultation with your advisor.

Format of the Research Proposal Seminar Announcement

(Note: Time, date, and room are examples only)

RESEARCH PROPOSAL SEMINAR NOTICE
GEOSPATIAL COMPUTER SCIENCE PROGRAM
COLLEGE OF ENGINEERING AND COMPUTER SCIENCE
TEXAS A&M UNIVERSITY-CORPUS CHRISTI

SUBJECT: Official Title of Your Dissertation

SPEAKER: You A. Student

DATE: [Insert day, month date, year]

TIME: 0:00 a.m./p.m.

PLACE: Building
Room

ABSTRACT

A 50-200-word abstract of your research proposal should appear here.

[NOTE: Students must post this notice electronically to faculty members and graduate students involved in the GSCS and other graduate programs. This is done by emailing a copy of the announcement to the GSCS Administrative Assistant requesting that the announcement be sent to the following listservs: GSCS faculty-list (gscs-faculty@listerv.tamucc.edu), GSCS student-list (gscs-student@listserv.tamucc.edu), Department of Computer Science faculty-list (csci-faculty@listserv.tamucc.edu), and College of Engineering and Computer Science (coen-list@listserv.tamucc.edu). Ensure you email a copy of the announcement to the College of Engineering and Computer Science Dean's Office (Academic Advisor).]

SECTION IV: DISSERTATION GUIDELINES

Your dissertation must conform to GSCS program and College of Graduate Studies (CGS) institutional standards. The following guidelines will help ensure your dissertation is completed and submitted appropriately. Consult the CGS Doctoral Student Handbook for specific formatting and submission requirements.

The GSCS Dissertation

Students will complete a study of the accepted standards of scholarly ethics and scientific integrity. The Ph.D. dissertation is a book-length, formal document that argues in defense of a particular thesis. Two important adjectives used to describe the dissertation are "original" and "substantial". The research performed to support a thesis must be both, and the dissertation must show it to be so. In particular, a dissertation highlights original contributions. Once data collection and analysis are completed, the research should be organized into a meaningful format and explained in a written narrative. The written narrative follows the style and format standard to scientific papers.

Dissertation research will not always go according to plans. Students must be prepared to adopt new methods of data collection or analysis if necessary and in consultation with the graduate advisory committee. Students should plan to take advantage of any opportunities to pursue side projects, as time and resources permit, to enrich understanding of the research topic.

The College of Graduate Studies Doctoral Student Handbook outlines the guidelines and requirements for formatting the dissertation. Templates in WORD and LaTex format are provided by the College of Graduate Studies and can be found at the following webpage: dissertation guidelines and templates**.** These templates include formatting for the title page, copyright page, and committee member page. Links to required doctoral forms, dissertation templates, and other pertinent information can also be found here: http://gradcollege.tamucc.edu/current_students/doctoral_students.html.

GSCS students may choose between two models for organizing the dissertation content: 1) the traditional model, and 2) the journal manuscript model. The "traditional" model presents the dissertation research content in a single, cohesive manuscript. Information is presented sequentially and no section stands alone as a publishable document. The "journal manuscript" model presents dissertation research as several discrete articles, each appropriate for submission to a journal, bound together as the dissertation document. In the journal manuscript model, information may be repeated as necessary between articles so that each can stand alone as an academic work. The journal manuscript format must also include an overarching introduction, a summary/conclusions section that brings the entirety of the research into context, and a literature cited section that encompasses the entirety of the manuscript. Regardless of whether the traditional or journal manuscript model is chosen, the entire document must be submitted in one format style. In other words, in the journal manuscript model, even though it is likely that articles will be submitted to several different journals, the entire dissertation must be presented in the style of only

one journal. Headings and subheadings, punctuation, reference citations, and other details should follow the journal format exactly with few exceptions.

When the draft is ready, submit it to the chair of your advisory committee. Submit the draft as if it were the final – make it as perfect as possible with respect to writing and grammar, punctuation and spelling, journal formatting requirements, and with all figures and tables in final format. Be prepared to go through the revision process numerous times before the committee chair is comfortable letting the rest of the committee review the document.

When the committee chair is ready for the document to be submitted to the rest of the committee, enough copies should be reproduced so that each member can have a copy. Ideally, committee members should return the corrected dissertation within two weeks of receipt. Students should check with committee members to ensure they have the time to review the document. A final draft delivered to the advisory committee one month prior to the dissertation seminar, would allow two weeks before the scheduled final defense/oral examination date for the student to make recommended changes. After the committee has returned the corrected draft, students should review suggested changes with their advisory committee chair, and make the suggested changes, unless the chair directs otherwise. (Note: A request to schedule the defense/final examination must be submitted by the published deadline (http://gradschool.tamucc.edu/current_students/doctoral_dates.html) on the appropriate form found at http://gradschool.tamucc.edu/forms.html (Form E).

Students should be prepared to go through the revision process more than once before the committee members are comfortable signing off on the final document.

Students should be sure to give their advisory committee chair enough time to review the manuscript and leave themselves enough time to make changes. In other words, students should make sure that they have left ample time prior to deadlines for all members to have adequate time to review the document and for all the changes suggested by the committee to be made. **The dissertation should be essentially complete before the dissertation seminar and final defense/oral examinations**. Any member of the graduate committee or the Dean of the College of Graduate Studies can reject the dissertation at any stage of the submission and approval process. Rejection of the manuscript can occur for many reasons including (but not limited to):

1. The manuscript does not conform to the required format
2. The manuscript is messy, poorly reproduced, or contains grammatical or spelling errors
3. The manuscript describes scientific data inconsistent with the research project approved in the dissertation proposal
4. The paper contains errors, inappropriate analysis of data, erroneous conclusions, or other scientific inaccuracies
5. The paper contains plagiarized work.

After a student has successfully presented the dissertation seminar, completed the defense/oral examination, and completed all changes to the dissertation manuscript that have been requested by the committee, the Dissertation Defense/Final Examination (Form F) report will be electronically routed for signatures and submitted to CGS (http://gradschool.tamucc.edu/forms.html).

The GSCS faculty expects students to submit dissertation research (in proper format) to scholarly journal(s) for publication. If the advisory committee chair or other person(s) including other faculty or scientists from funding agencies, etc., made a significant contribution to the research or writing of the manuscript to be submitted, then the person should be listed as a co-author on the published article. The student and the advisory committee chair should agree on the order of authorship. Seriously consider co-author status if a person:

1. Supported the work through a grant that was authored by them
2. Did a significant portion of field or laboratory work
3. Contributed materially and intellectually to the research
4. Contributed to the writing

In all cases, acknowledge the chair of the advisory committee, other members of the graduate advisory committee, other people that offered assistance and TAMU-CC in the publication. It is courteous to acknowledge persons, who assisted in any major way including moral support, lab/field/research assistance, and of course, any source of financial assistance.

Dissertation Seminar & Final Defense/Oral Examination

The comprehensive exam must be passed and courses in the plan of study completed with a GPA of 3.0 or greater before the dissertation defense/final examination will be scheduled. Once the dissertation is completed and approved by the advisory committee, the results of the research must be presented orally and publicly. The dissertation defense/final examination must cover, but is not limited to, the dissertation. The defense must be scheduled for a minimum of **six weeks** prior to graduation. The seminar should be scheduled and completed prior to the final defense/oral examination. The final defense/oral examination usually takes place immediately following the seminar, but it can be scheduled on a separate day if necessary to accommodate the schedules of committee members.

Subsequent to the dissertation defense/final examination, and **only** after all changes to the dissertation manuscript requested by the committee have been made, the student will submit an electronic copy of the dissertation, no later than **four weeks** prior to graduation, to ProQuest/UMI as a single PDF file (see CGS Doctoral Student Handbook for detailed instructions).

Students not completing all requirements of the Final Dissertation Defense by the end of the semester, such as turning in an approved final draft by published deadlines, will receive a grade of In Progress (IP). The student must register for the same course in the subsequent semester, paying all the appropriate tuition and fees, to receive a final grade for the course.

After your **Dissertation Defense & Final Examination Report** (Form F) is submitted electronically and all requested changes have been made, you can submit your dissertation electronically.

Dissertation Seminar

The Dissertation Seminar is a formal oral and visually supported presentation of the results of the research or of some pertinent aspect of the research. Although it will generally be longer than a paper presented at a scientific meeting, it should be similar in format and design. The defense

should review parts of the dissertation including the background and relevance of the research, the methods, the results, and the conclusions. Professional quality visual aids must complement the oral presentation. As a general rule, the oral presentation should last about 45 minutes and at least 15 additional minutes should be allowed to answer questions from the audience at the end. Your committee will reserve most of their questions for the final defense/oral examination during the closed session.

Students must prepare and submit a formal announcement of the dissertation seminar to their committee chairperson for approval at least two weeks prior to the seminar date. It is the student's responsibility to contact each committee member and arrange a time and place for the event. All committee members must attend the seminar. The student is responsible for posting the seminar notice as an e-mail to all appropriate listservs at least one week prior to the seminar date. Email a copy of the seminar notice to the College of Engineering and Computer Science Dean's Office (Academic Advisor) and GSCS Administrative Assistant.

Final Defense/Oral Examination

The purpose of the final defense and oral examination is to allow advisory committee members to gauge the scope of the student's understanding of the principles and significance of the discipline of the dissertation research. It complements the qualifying examination, which gauges overall knowledge in the field, by allowing a more detailed assessment of specific knowledge as it applies to the dissertation research. The exact format and scope will vary among students depending on both their advisory committee and the nature of their research.

The graduate advisory committee will decide whether a student has passed the final defense and oral examination. Regardless of whether the student passes or fails, the committee will discuss with the student their assessment of the student's performance. If a student fails, the exam may be retaken only once, and only after at least four months have passed.

Format of the Dissertation Seminar Notice

(Note: Time, date, and room are examples only)

RESEARCH DISSERTATION SEMINAR NOTICE
GEOSPATIAL COMPUTER SCIENCE PROGRAM
COLLEGE OF ENGINEERING AND COMPUTER SCIENCE
TEXAS A&M UNIVERSITY-CORPUS CHRISTI

SUBJECT: Official Title of Your Dissertation

SPEAKER: You A. Student

DATE: [Insert day, month date, year]

TIME: 0:00 a.m./p.m.

PLACE: Building
Room

ABSTRACT

The abstract of your dissertation or graduate project should appear here (shortened version if necessary). An abstract of 50-200 words length is recommended for inclusion in the Graduate Seminar Notice.

[NOTE: Students must post this notice electronically to faculty members and graduate students involved in the GSCS and other graduate programs. This is done by emailing a copy of the announcement to the GSCS Administrative Assistant requesting that the announcement be sent to the following listservs: GSCS faculty-list (gscs-faculty@listerv.tamucc.edu), GSCS student-list (gscs-student@listserv.tamucc.edu), Department of Computer Science faculty-list (csci-faculty@listserv.tamucc.edu), and College of Engineering and Computer Science (coen-list@listserv.tamucc.edu). Ensure you email a copy of the announcement to the College of Engineering and Computer Science Dean's Office (Academic Advisor).]

SECTION V: GENERAL INFORMATION

This section of the handbook includes standardized information about rules and policies pertaining to graduate education at Texas A&M University. It is not intended to be comprehensive. You are strongly encouraged to read the sections of the catalog pertaining to graduate students, which will provide more detail and additional topics that may impact you. You will also find information about your program.

Graduate Admissions

To be admitted to a program of graduate study, an applicant must hold a bachelor's degree from an accredited institution of higher education in the United States or an equivalent foreign institution. *(Note: The requirement to hold a bachelor's degree does not apply to students enrolling in the RN-MSN option in nursing.)* Decisions concerning admission to graduate study are based on all admission criteria. To be considered for a graduate program, a minimum last 60-hour GPA of 2.5 is required. Some programs may have higher GPA requirements; review specific program information in the graduate catalog or elsewhere in this handbook. All applications must be made via the following web site: https://www.tamucc.edu/grad-college/index.php. For complete information, see the Catalog, Graduate Admissions section.

Graduate students should be aware of their enrollment status, as it may impact financial aid, veteran's benefits, or other important aspects of graduate life. In addition, international students have specific requirements about enrollment status. Enrollment status for graduate students is as follows:

Full-time graduate student	Fall or spring term = 9 hours Combined summer terms = 6 hours
Three-quarter-time graduate student	Fall or spring term = 7 hours Combined summer terms = 5 hours
Half-time graduate student:	Fall or spring term = 5 hours Combined summer terms = 3 hours

Continuous Enrollment

Unless on an approved leave of absence (see below), students in terminal degree programs must be enrolled continuously for at least 3 semester credit hours each fall and spring semester and pay designated tuition and fees. Individual programs may have additional credit hour requirements or may require students to continuously register in courses for a minimum of two consecutive terms which may include summer. See specific program information in the graduate catalog or elsewhere in this handbook for additional requirements for your program. Students should be aware that unapproved leaves in a fall or spring semester may result in the student being required to re-apply to their program.

Leave of Absence

Students experiencing life changing or catastrophic events should consult with their program coordinator and/or department chair and request a Leave of Absence in writing from the College of Graduate Studies using the Request for Leave of Absence form. A student who is in good standing may petition for a leave of absence of no more than two full academic terms. The maximum number of leave of absence requests permitted in a program is two. A request for a leave of absence requires approval in advance by the faculty advisor, Program Coordinator, College Dean, and Graduate Dean. If the Graduate Dean approves the petition, the registration requirement is set aside during the period of time of the leave. Students should be aware that leaves of absences require suspension of all activities associated pursuit of the degree. See the catalog for more information.

Maximum Course Load

Graduate students may not register for more than 12 hours in a regular semester, 6 hours in a single session of summer school, or 12 hours in the combined summer session (not including Maymester) without the approval of the appropriate College Dean. See the Maximum Course Load section in the catalog.

Repetition of a Course

There are specific policies about repeating courses for higher grades, including the provision that graduate students may retake a maximum of two courses during graduate study at the University. Each course may be repeated only once. Some courses may be repeated for multiple credit if those courses are so designated in the course description and approved by the faculty or program advisor as designated by their college. Complete catalog information may be found in the Graduate Academic and Degree Requirements section of the catalog.

Time Limit to Degree

The requirements for Ph.D. degrees at Texas A&M University-Corpus Christi must be completed within ten years subsequent to enrollment in the terminal degree program. The ten-year period begins with the first semester in which the student enrolls and is calculated from the date of degree conferral. Students have a maximum of five years to advance to candidacy and a maximum of 5 years from candidacy to successfully defend the dissertation. Students who exceed the candidacy deadline may request an extension. Candidacy extensions require strong justification in writing from the student and must include a plan for timely completion of the comprehensive examination, the proposal, and the final dissertation. The extension must be approved by the student's faculty advisor, the department chair, the College Dean, and the Graduate Dean. Credit that is more than ten years old will not count toward a terminal degree. Exceptions will only be considered for courses completed at Texas A&M University-Corpus Christi and will require strong justification in writing from the student requesting the exception as well as a revalidation plan. Written approval from the major department chair, the Dean of the college from which the degree is offered, the Graduate Dean, and the Provost are required.

Revalidation of Courses Beyond Degree Time Limit

In order to revalidate dated courses, students should carefully attend information in the catalog (see Graduate Academic and Degree Requirements section of the catalog. Revalidation requests should be made using the Revalidation Request Form.

If your program has shorter time-to-degree limits, it may impact recency of credit and other timelines. See program information in this handbook or discuss with the Program Coordinator.

Academic Requirements for Graduate Work

Good Standing. Graduate Students, including degree-seeking, certificate-seeking, and non-degree-seeking students are considered in "good academic standing" if they maintain a minimum 3.0 grade point average (GPA) on all graduate course work and earn a grade of S (Satisfactory), IP (In Progress, or CR (Credit) on all course work that does not affect GPA. A higher GPA may be required by some programs. In such cases, the higher standard will be substituted for 3.0 in all other matters related to good academic standing. A complete discussion of academic requirements including but not limited to scholastic probation and enforced withdrawal may be found in the Graduate Academic and Degree Requirements section of the catalog. For information regarding the effect of scholastic probation and enforced withdrawal, see the Financial Assistance Suspension Policy in the Tuition, Fees, & Financial Assistance section of the catalog.

Texas 99 Hour Rule

The Texas State Legislator enacted a rule that provides that students at all state universities with over 99 doctoral hours may be subject to the payment of nonresident tuition. A student will generally be able to study at TAMU-CC full-time for five complete academic years, including summers, before being affected by the 99-hour rule. For students staying beyond five years, in a number of cases there is still the possibility of a programmatic or individual exemption from the rule. For more information, contact your Program Coordinator.

Academic Integrity

Texas A&M University-Corpus Christi students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, which include but are not limited to illicit possession of examinations or examination materials, falsification, forgery, plagiarism, or collusion in any of these behaviors. All students should familiarize themselves with the full Academic Integrity Policy as well as the processes and procedures used to address violations thereof. You can find additional information in the Academic Integrity section of the catalog. Students can also access University Rules and Procedures 13.02.99.C0.04: Student Academic Misconduct Cases.

Additional Information

Information, policies, and procedures about tuition, fees, financial assistance, scholarships, and other topics important to graduate students can be found in the catalog. In addition to the catalog, web pages for offices and services on campus provide expanded information, forms, and contact names/phone numbers. Some of those webpages include the following:
College of Graduate Studies
Office of Student Financial Assistance
Office of International Education
Scholarships
GROW
Assistantships

SECTION VI: APPENDICES

Appendix 1: GSCS Program Application Checklist

- Persons seeking admission to the GSCS program should first contact the program to identify a faculty member willing to serve as their graduate advisor. Applicants will not be admitted to the program without a graduate faculty advisor.
- Complete the 'Apply Texas Application' along with the application fee.
- Submit an essay (Approximately 500-1000 words in length) describing educational background, reason for seeking admission to the GSCS program, and what your research plans are within the program.
- Request 3 letters of recommendation
    - Letters of recommendation should be requested from individuals who are familiar with your academic achievement and potential and provide them with the required evaluation forms.
    - If you have been out of school for a number of years and are unable to contact former professors, you may request recommendations from people such as employers who are familiar with you and who can comment on your potential to succeed in the program.
- Request official transcripts documenting all senior-level post-secondary institutions you attended. Transcripts must be sent directly to CGS. An official statement of the award of the degree or diploma is required for each degree completed.
- Request that the required GRE test scores be sent directly from the Educational testing service to CGS (Code 6849)
    - GRE scores must be not more than 5 years old, respectively
- Application requirements for international applicants:
    - Copy of current Visa (if applicable)
    - English Language Proficiency. TAMU-CC currently accepts the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) within the last 2 years
    - Official TOEFL score minimum paper-based score of 550 or internet-based score of 79-80
    - Official IELTS score minimum 6.5
- Apply separately to College of Engineering and Computer Science for financial assistance.

Domestic/International Students	**Fall Semester**	**Spring Semester**	**Summer Semester**
Priority deadline	February 1	August 1	Not Offered
Last date for receipt of applications	July 15	November 15	Not Offered

Appendix 2: GSCS Ph.D. Program First-Year Checklist

- Meet with your primary advisor prior to enrolling for first semester classes.
- Meet with GSCS Program Coordinator prior to enrolling for first semester classes, or within the first semester to review the degree plan.
- Form Graduate Advisory Committee (GAC) by the end of year 1.
    - Work with your primary advisor (Committee Chair) to organize the committee.
        - Committee Chair is the faculty member who agreed to be your primary advisor once accepted into the program.
    - Meet with other faculty members about research interests.
- Prepare a degree plan with your GAC by the end of year 1.
    - Leveling coursework
    - Elective coursework
    - Dissertation topic
- Prepare research prospectus (3-5 pages)
- Meet your GAC and present your prospectus.
    - Organize a meeting with your GAC to present your prospectus and discuss research and study plans with your committee.
    - GAC reviews your degree plan.
- College of Graduate Studies (CGS) appoints a Graduate Faculty Representative (GFR)

Appendix 3: GSCS Ph.D. Program Degree Requirements Checklist

I. Coursework

- Leveling coursework (if necessary) as specified by GAC and GSCS Program Coordinator
- Tentative Degree Plan approved by CGS and Research Prospectus approved by GAC. Submit copies of both to the College of Engineering and Computer Science Dean's Office (Academic Advisor) by the end of the first year, but **no later than 18 months** after beginning the doctoral program
    - Minimum 75 hrs beyond bachelor's degree, or 57 hrs beyond master's degree
    - 12 hrs Core Curriculum and 3 hrs GSCS 6302 Graduate Seminar
    - 3.0 minimum GPA
    - Research Prospectus (3-5 pages) developed with chair/GAC
    - Final Degree Plan for signature approval to Program Coordinator, Dept. Chair, College Dean, and CGS no later than **the census day (12th class day)** of the semester prior to the graduating term.
    - Deadline to apply for graduation is the last day of classes in the semester prior to graduation.

II. Research Proposal

- Research Prospectus presented to committee and submitted to CGS by end of the second semester (3-5 pages)
- Dissertation Research Proposal
    - Independent, detailed, original, systems-based inquiry
    - Modified from the Research Prospectus with GAC input
    - Submit draft to committee chair for review
        - Complete revisions until approved by the chair
    - Share with GAC, after chair approval, at least two weeks prior to seminar
    - Present a proposal seminar to public and defend
        - Submit Doctoral Dissertation/Project Proposal Hearing Request Form (Form D) to CGS at least two weeks prior to scheduled seminar date
        - Post announcement to relevant Listservs at least 1 week in advance
        - One hour public, one to two hours closed
    - Obtain signatures of approval by the entire GAC
    - Signed version of proposal submitted to College Dean (Academic Advisor); Copies sent to GAC members and GSCS Administrative Assistant.
    - Should be approved by end of second year of graduate study

III. Admission to Candidacy [**Major Decision Point**]

- Residence requirement: At least 9 credit hours in 2 consecutive semesters
- Completed *formal* coursework on Degree Plan

    - Excluding research hours
    - 3.0 minimum GPA
- Dissertation Research Proposal on file with College of Engineering and Computer Science Dean's Office (Academic Advisor)
- Qualifying Examinations
    - Written examination from each GAC member
    - Oral examination with GAC
    - Can cover both core knowledge and areas of research
    - Schedule after completion of proposal seminar/defense, within six hours of completion of *formal* coursework or soon after completion
    - Speak with each GAC member to prepare
    - Must pass within 12 months of coursework completion
    - Notify CGS of outcome (submit Form B)

IV. Teaching Experience

- A relevant teaching experience of at least 3 credit hours as instructor of record is recommended for those pursuing an academic career (but not required)
    - Consult with the GSCS Program Coordinator and your advisor

V. Dissertation

- Data collection and analysis completed
- Choose format, in consultation with your chair, and prepare according to guidelines
    - Multiple iterations of editing
    - With committee chair approval, provide copies to GAC *at least* 1 month prior to final defense
    - Committee returns edited versions, typically before date of defense
    - Review and incorporate suggested changes from the committee
    - Additional review by GAC may be required
- Submit final, corrected version of Dissertation to CGS following successful defense
    - See CGS doctoral Student Handbook for instructions
- Note: Completion of the GSCS Ph.D. is driven by the dissertation as a product of research, rather than by external factors or commitments

VI. Dissertation Defense

- Must have been admitted to Degree Candidacy at least 1 semester prior to defense
- Must be registered for credit for semester in which the final defense takes place
- Apply for graduation in College of Engineering and Computer Science Dean's Office (Academic Advisor) by published deadline. The student must complete all requirements for the degree at least three weeks prior to the end of the semester in which the degree will be conferred.
- Contact GAC to schedule Dissertation Seminar and Final Defense

    - Must be held at least six weeks prior to graduation
- Submit formal seminar announcement to committee chair at least 2 weeks in advance
- Schedule rooms for seminar and defense
- Post announcement to relevant Listservs at least 1 week in advance
- Email copy to College of Engineering and Computer Science Dean's Office (Academic Advisor)
- Present Dissertation Seminar and stand for the Final Defense
- Complete all requirements for the degree at least three weeks prior to the end of the semester in which the degree will be conferred

Appendix 4: GSCS Ph.D. Program Timeline

Milestone	Entering with BS Degree		
	Deadline	**Grace**	**Penalty**
Committee formed	1st sem	2nd sem	*Registration Bar
Degree Plan	1st sem	2nd sem	Registration Bar
GFR added	2nd sem		
Prospectus	2nd sem	3rd sem	Registration Bar
Proposal/Seminar	6th sem	7th sem	Registration Bar
Formal Courses	6th sem	7th sem	Registration Bar
Candidacy Exam	6th sem	8th sem	Registration Bar
Final Dissertation	10 years (20 sem)	0	Courses expire after 10 years

Milestone	Entering with MS Degree		
	Deadline	**Grace**	**Penalty**
Committee formed	1st sem	2nd sem	*Registration Bar
Degree Plan	1st sem	2nd sem	Registration Bar
GFR added	2nd sem		
Prospectus	2nd sem	3rd sem	Registration Bar
Proposal/Seminar	4th sem	5th sem	Registration Bar
Formal Courses	4th sem	5th sem	Registration Bar
Candidacy Exam	5th sem	6th sem	Registration Bar
Final Dissertation	10 years (20 sem)	0	Courses expire after 10 years

(sem = fall, spring; 10 week summer session considered part of grace period, if applicable)
*Deficiency must be made up before registering for next semester, and students must be registered full-time to be eligible for any graduate assistantships or scholarships.