

Ph.D. Student Handbook

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TEXAS A&M UNIVERSITY

Construction Science

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Welcome to the Ph.D. in Construction Science Program at Texas A&M University!

Pioneering Excellence Since 1946

Embark on a transformative journey with the Department of Construction Science, a beacon of excellence in construction higher education since 1946. As the largest construction education program in the nation, boasting approximately 1,400 undergraduate, 120 M.S., and 30 Ph.D. students, we are thrilled to have you join our thriving community of future leaders in Construction!

Your Pathway to a Flourishing Career in Construction Science

The construction industry is one of the major industry sectors for the nation. The industry is rapidly changing by embracing and applying highly tech and knowledge driven processes and methods such as advanced data analytics, computer vision technologies, 3D printing, virtual reality, digital twin, and artificial intelligence. These advanced processes and technologies offer tremendous innovation opportunities for the construction industry by improving efficiency in processes, productivity, and job site safety. Our Ph.D. program's curriculum is designed to meet this growing demand of the rapidly changing environment in Construction.

Through our Ph.D. in Construction Science program, you will engage in an advanced educational experience that integrates deep theoretical insights, research methodologies, and innovative practices. This program is tailored for those who aspire to take a leadership role in the construction industry or academia. It's designed for students from diverse backgrounds, including construction, architecture, engineering, and business, preparing them to not only excel but also drive innovation in the construction sector. Our Ph.D. degree is a pathway to becoming a key influencer in the field, innovating traditional construction methods, embracing the latest technologies, and mastering complex management processes. Whether you're aiming to elevate your career to its peak or immerse yourself in the realm of construction research, your journey begins here!

An Interdisciplinary Approach to Success

Our program exemplifies the applied construction degrees, navigating through an interdisciplinary approach that intertwines principles of architecture, technology, engineering, business, and project management. During your Ph.D. journey, you will contribute to groundbreaking research, collaborate with industry experts, and potentially shape future construction policies, processes, and technologies.

We're delighted to welcome you into our Ph.D. program where your educational journey is not just about acquiring a degree but mastering the art and science of innovative construction theories and practices. Let's build the future together!

Welcome aboard, future leader!

The Department of Construction Science
Texas A&M University

INTRODUCTION

The handbook describes the policies, procedures, degree requirements, and major milestones that both prospective and enrolled students must follow while pursuing a Doctor of Philosophy in Construction Science in the Department of Construction Science at Texas A&M University. This handbook, along with its supporting documents, is a must-read for all incoming PhD students. The responsibility is on the student to fulfill all the requirements of the Ph.D. program and keep track of all deadlines, as outlined in the Graduate School's academic calendar.

The Ph.D. program provides a wide array of fundamental knowledge, advanced processes and technologies, innovative research opportunities, and career prospects in the field of Construction Science. This degree is designed to provide you with an ideal pathway to seek a future in academia, research in public or private sectors, or advanced leadership in industry. A Ph.D. serves as a testament to one's research and scholarly aptitude, reflecting a profound understanding of a specific field, along with strong analytical abilities and communication.

The educational objectives of the COSC Ph.D. program are:

- a) To prepare construction scientists to carry out effective research and inquiry in science and technology, and to advance the body of knowledge in construction.
- b) To prepare construction managers with advanced business skills to be practical leaders in construction and construction-related industries.
- c) To serve the academic needs of colleges and universities in the state of Texas and the world, qualifying graduates to teach in related programs, as well as in programs of construction higher education, which is responsive to the requirements for employment for many construction education faculty positions.

ADMISSION PROCESS

Applicants for the Ph.D. in Construction Science are expected to hold a bachelor's degree or a master's degree in closely-aligned disciplines including, but not limited to, Construction Management, Construction Science, Building Construction, Project Management, Decision Science, Facilities Management, Architecture, Regional Planning, Civil Engineering, Mechanical Engineering, Electrical Engineering and Computer Science. Applicants who have different academic backgrounds from the list above, but can provide evidence of a significant amount of knowledge and experience in the construction industry and express a strong desire to acquire a Ph.D. degree in Construction Science may be admitted. Students without one or more of these typical requirements but with exceptional talents or preparation will also be encouraged to apply. Admission is also dependent upon the availability of an appropriate faculty member with an interest and expertise in the applicant's proposed emphasis area, who consents to work with the applicant, if he/she enrolls, and to advise the student during initial stages of the student's matriculation.

Admission is offered to the best-qualified applicants based on the number of spaces available in the Ph.D. graduate program. Typically, 7-8 students are admitted to the program for Fall semester.

In addition to the application materials required by the university, applicants to the Ph.D. program will be required to submit the following materials electronically as part of his/her application packet:

- A current resume
- A statement of Interest and purpose
- Three letters of recommendation from persons familiar with the applicant's academic and professional accomplishments
- GRE scores (Verbal Reasoning, Quantitative Reasoning, & Analytical Writing)
- TOEFL scores [for international applicants only]
- Official transcripts from all previous institutions

Admission Criteria

Applicants must meet the following minimum requirements to be considered for admission:

- | | |
|--|-----------------|
| • GRE total score [verbal and quantitative] | Minimum 302 |
| • GRE verbal score | Minimum 146 |
| • GRE quantitative score | Minimum 148 |
| • GRE written score | Minimum 3.0/4.0 |
| • Grade point average [GPA] for last 60 hours of undergraduate work on a 4.0 scale | Minimum 3.0/4.0 |
| • Grade point average [GPA] for last 60 hours of graduate work | Minimum 3.4/4.0 |

For applicants who did not receive their baccalaureate and/or master's degree at a U.S based institution, the following English proficiency test and GRE general test results are required in addition to other admission criteria.

- a) A minimum TOEFL score of 550 [paper-based], or 80 [internet-based] or an IELTS score of at least 6.0.
- b) Submission of GRE general test scores

For applicants who received their baccalaureate and/or master's degree at a U.S based institution, the GRE general test results are required in addition to other admission criteria. The department, however, may waive the GRE requirement for applicants with a proven record of academic excellence.

ELPE Examination

Upon arrival at Texas A&M University (TAMU), all international students from countries whose native language is not English must take the English Language Proficiency Exam (ELPE). International students must achieve a minimum score of 70 out of 100 on all ELPE sections before taking any PH.D. courses, except COSC 681. Students are allowed to enroll in PH.D. courses only if they are also enrolled in all English Language Institute (ELI) courses in their respective areas of deficiency during the same semester. International students who take the ELI courses and receive a grade of B or higher are considered to have passed the corresponding ELPE section.

A student will not be able to defend his or her Ph.D. dissertation (by submitting the Request for Final Examination form) without completing all department ELPE requirements, as stated above. A student who has not completed all ELPE requirements by the end of his or her second semester in the PH.D. program will be put on scholastic probation (See appendix D). The only international students exempt from this

requirement are those who have earned a four-year baccalaureate degree or higher from an accredited U.S. universities are exempt from this requirement. For further information, please visit the following website: <https://grad.tamu.edu/academics/academic-success-resources/elp>.

Application Deadline

The application deadline for fall admission is January 15th. All applications received by this date will be reviewed for admission and considered for scholarships offered by the School of Architecture and departmental funding. Applications received after this date will be reviewed for admission and considered for funding as space and funds allow, including Aggie Priority applications.

Decision

Admission letters will state the date by which the applicant must accept the offer of admission (typically April 15th), or the offer of admission may be revoked.

DEGREE REQUIREMENTS

The Ph.D. program in Construction Science follows the Ph.D. requirements as described in the TAMU Graduate Catalogue: (1) For a student who has completed a baccalaureate degree but not a master's degree, a minimum of 90 hours is required on the degree plan for the degree of Doctor of Philosophy; and (2) For a student who has completed a master's degree, a minimum of 60 hours is required on the degree plan for the degree of Doctor of Philosophy. The Ph.D. degree in Construction Science will include six categories of courses:

- 1) Fundamental course requirement: 14 hours of courses
- 2) Research methods courses requirement: at least two research methods courses (6 credit hours)
- 3) Concentration area courses requirement: 9 hours of courses in one selected area
- 4) Free electives: a minimum of 18 credit hours of courses for a student entering with a baccalaureate degree and a minimum of 9 credit hours of courses for a student entering with a master's degree that supports the Ph.D. student's research activities and interests
- 5) Dissertation: COSC 691 courses (Additional credits) – a minimum of 18 credit hours, and
- 6) Industry internship (optional): up to 3 credit hours.

Table 1 outlines the general graduate curricula of the Ph.D. in Construction Science required of students entering the program with a baccalaureate degree and students entering the program with a master's degree.

Students who have not completed a BS in Construction Science or a closely related discipline may be required to take undergraduate courses as prerequisites for the graduate-level courses in the degree programs. All leveling coursework will be assigned on an individual basis after a review of the student's previous coursework.

Students will be allowed to transfer courses from other institutions, with the maximum number of transfer hours not exceeding 24. A maximum of nine undergraduate credit hours from 300 and 400-level courses will be allowed. A maximum of 24 credit hours of any combination of the above may be used. All degree requirements must be completed within ten years of entering the degree program.

Table 1. Semester Credit Hour Requirements by Category

Category	SCH Entering with a Bachelor's	SCH Entering with a Master's
Leveling or prerequisite courses	Not counted toward the degree	Not counted toward the degree
Required fundamental courses (see Table 2)	14 hours	14 hours
Research methods requirement (see Table 2)	6 hours	6 hours
Concentration area courses (see Table 3)	9 hours	9 hours
Electives (see Appendix E)	Minimum of 18 hours	Minimum of 9 hours
Dissertation	Minimum of 18 hours	Minimum of 18 hours
Other (Specify, e.g., internships, clinical work, residencies)	up to 3 hours (Internship)	up to 3 hours (Internship)
TOTAL	90 hours	60 hours

DOCTORAL DEGREE PROGRAM STRUCTURE AND TIMELINES

The tables in this section show the available courses for each coursework requirement category. Table 2 shows core courses required by all COSC Ph.D. students. Ph.D. Students, regardless of having completed a MS or entering from a bachelor degree, must take all fundamental courses (in total, 14 credit hours). However, courses in this category may be waived with sufficient evidence on the student's transcript that similar coursework has been completed previously at the graduate level, or with the approval of the student's advisory committee. If some of these courses are waived, they will be replaced with the same number of credit hours of Construction Science electives.

All Ph.D. students must complete COSC 690 (Theory of Research in Construction Science). COSC 690 may be waived with sufficient evidence on the student's transcript that a similar coursework has been completed previously at the graduate level, or with the approval of the student's advisory committee. If COSC 690 is waived, the course will be replaced with the same number of credit hours of construction science electives. To fulfill the remaining 3 credit hours of research methods courses requirement, Ph.D. students need to discuss with their Ph.D. advisory committee to determine a course that will be appropriate to support their Ph.D. research. Once consensus is reached between the student and the committee, the student takes the course as a research methods course and the advisory committee approves it. An additional course taken by the student in the research methods category in Table 2 can be counted toward elective course requirements.

Table 2. Required/Core Courses

Prefix and Number	Required/Core Course Title	SCH
FUNDAMENTAL COURSES		
COSC 601	Construction Practices	3
COSC 602	Construction Estimating	3
COSC 603	Construction Scheduling	3
COSC 621	Advanced Project Management	3
COSC 681	Graduate Seminar	2
RESEARCH METHODS		
COSC 690	Theory of Research in Construction Science (Required)	3
COSC 689-xxx	Data Science for the Built Environment	3

Areas of Specialization

The COSC Ph.D. program offers three concentration options: Area A) Construction Management and Safety; Area B) Smart Construction; and Area C) Construction Sustainability. To meet the concentration requirement, the Ph.D. student must take an additional 9 hours of credit from one of the concentration areas. Table 3 shows the available courses for each concentration area. Any additional courses taken by the student in this category can be counted as elective course requirement.

Table 3. Prescribed Electives for Concentration Areas

Prefix and Number	Concentration Course Title	SCH
Concentration Area A - CONSTRUCTION MANAGEMENT & SAFETY (CHOOSE 3 OF 6)		
COSC 620	Construction Company Operations	3
COSC 622	Construction Economics	3
COSC 624	Construction Accounting and Financial Management	3
COSC 628	Law and Risk Management	3
COSC 631	Advanced Construction Productivity and Lean	3
COSC 689-xxx	Advanced Construction Safety and Health Management	3
Concentration Area B - SMART CONSTRUCTION (CHOOSE 3 OF 4)		
COSC 608	Structural Principles and Practices	3
COSC 642	Construction Information Technology	3
COSC 644	Advance Construction Systems	3
COSC 650	Advanced Construction Visualization	3
Concentration Area C - SUSTAINABLE CONSTRUCTION (CHOOSE 3 OF 6)		
COSC 606	Mechanical and Electrical Construction	3
COSC 663	Sustainable Construction	3
COSC 622	Construction Economics	3
COSC 631	Advanced Productivity and Lean	3
COSC 670	Facilities Asset Management	3
COSC 689-xxx	Life Cycle Assessment in Building Construction	3

Appendix E provides some example elective courses offered by other programs that may be appropriate for COSC Ph.D. students. In addition to these example courses, students can take 16-32 semester credit hours in any graduate-level course or any undergraduate level course designated as 300-400 level, with the approval of the advisory committee.

Typical Timeline

This section outlines the typical milestones needed to complete the Construction Science Ph.D. program at Texas A&M University. There are a total of five milestones: completion of qualifying exam (qualifying paper), Ph.D. degree plan, preliminary exam (written and oral) including PhD proposal defense, and Ph.D. dissertation defense.

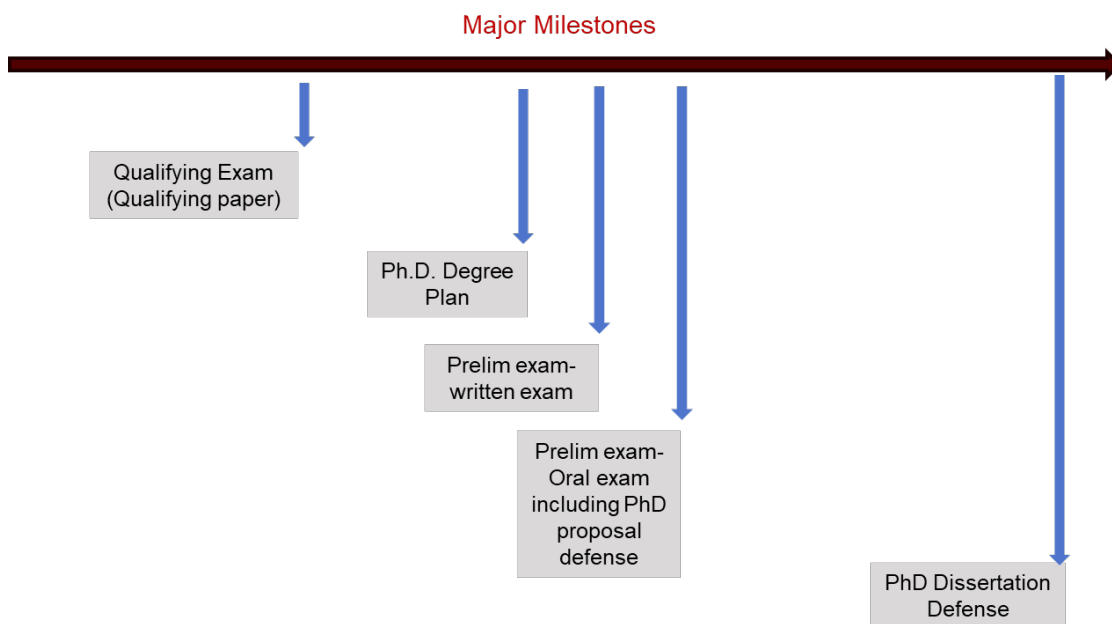


Figure 1. COSC Ph.D. Degree Milestones

Initial Steps – First Semester, Year 1

Students admitted into the Ph.D. program are expected to have an advisor and discuss a degree plan that will be suitable for them. The student admitted to the program can fill a petition for a core coursework waiver if equivalent courses as part of an M.S. degree or during the later years of undergraduate degree program were taken. The following steps must be taken:

- Identify which course(s) you want to seek a waiver for.
- Discuss your intention with your advisor and get his/her understanding and preliminary approval.
- Submit a petition to the Ph.D. program coordinator via Graduate Programs Office describing your full justification statement with evidence (such as your transcripts and course work description and syllabus).
- Complete the waiver form attached in appendix A.

- The Ph.D. program coordinator will review your petition and make the final decision.

Qualifying Examination (Qualifying Paper) – Year 2

When a Ph.D. student has taken COSC 690: Theory of Research in Construction Science, and fulfilled at least 50% of the required courses including fundamental courses and research methods courses, the student will be eligible for taking a qualifying examination (See and complete form in Appendix B). The student must take the exam within the first three regular semesters of his/her Ph.D. program. However, an extension of one semester may be allowed with the approval of the student's advisor. The student will submit a research paper to his/her Ph.D. qualifying exam committee of three faculty members. The student's advisor will serve as the chair of the committee. One member of the committee must be assigned by the Ph.D. program coordinator in consultation with the student's advisor.

An oral presentation of the student in front of the committee is required and it must take place within a month after the submission of the qualifying paper to the committee. The committee will review and evaluate the quality of the paper and the student's presentation to determine whether the student has passed or failed the qualifying exam. The committee will evaluate the student's ability to a) build a sound research problem or a research hypothesis, b) conduct a comprehensive literature review by synthesizing information gathered, and identifying the state of the art and clear gaps, c) build a scientific research methodology, d) conduct evidence based research to solve the research problem or test the research hypothesis, and e) present the research results in a professional manner with discussions and future research directions. The quality of the paper is expected to be sufficient to be publishable at a major conference at a minimum for the student to pass the exam. Students may attempt the qualifying exam twice. Any students unable to pass the exam after two attempts will not be allowed to continue their Ph.D. studies. These students will be permitted to complete the MS degree in Construction Science.

Ph.D. Degree Plan – Year 2 or Year 3

Once the student has passed the qualifying exam, the student works with his or her advisor to form his or her Ph.D. advisory committee of at least four members, each of whom must have a graduate faculty appointment at TAMU. In addition to the chair, at least one other committee member must be from the Department of Construction Science. At least one member must be from an academic department other than the Department of Construction Science. Committee members outside the University - i.e., qualified scientists at other academic institutions, governmental agencies, or industries may be authorized as Adjunct or Associate Graduate Faculty, given that their expertise is necessary or beneficial to the guidance and/or completion of the student's research. These appointments will be made through the Department of Construction Science as outlined by the TAMU rules for graduate faculty appointments.

Students will choose courses for their degree plan with the guidance of their advisory committee. The limitations on certain courses, as prescribed by the TAMU graduate catalogs, will be in effect. On an individual basis, students will consult with their Ph.D. advisory committee to choose additional undergraduate and/or graduate Construction Science -related courses with restrictions. A student may petition to use alternate classes to those specified above if he/she has already taken equivalent courses. Once the student's Ph.D. committee approves the Ph.D. degree plan, the student is ready to take the preliminary examination.

Ph.D. Preliminary Exam, Proposal Approval, and Candidacy - Year 3

To earn the Ph.D. candidacy status, a Ph.D. student must pass the preliminary examination and obtain the acceptance of the student's dissertation proposal by the student's Ph.D. advisory committee. After passing the qualifying examination, the Ph.D. student must fulfil the research methods requirement, the fundamental course requirements, and core concentration area courses requirements that are documented in his or her Ph.D. degree plan to be eligible for taking the preliminary examination followed by the student's Ph.D. research proposal review and approval.

Once the student passes the comprehensive qualifying examination, the student is allowed to present his/her Ph.D. dissertation proposal to the advisory committee for their review and approval. For most Ph.D. students, the student's Ph.D. advisory committee typically administers the preliminary examination and the review of the student's Ph.D. dissertation proposal concurrently. See below Figures 2, and 3 for a typical sequence of preliminary examination. All students will be required to choose one area of concentration. The exam will test the knowledge in the selected concentration area, general construction science knowledge that can be obtained from the required fundamental courses, and the knowledge on his/her selected Ph.D. research topic. The exam includes a written portion and an oral portion. The oral portion includes the student's Ph.D. proposal presentation and defense.

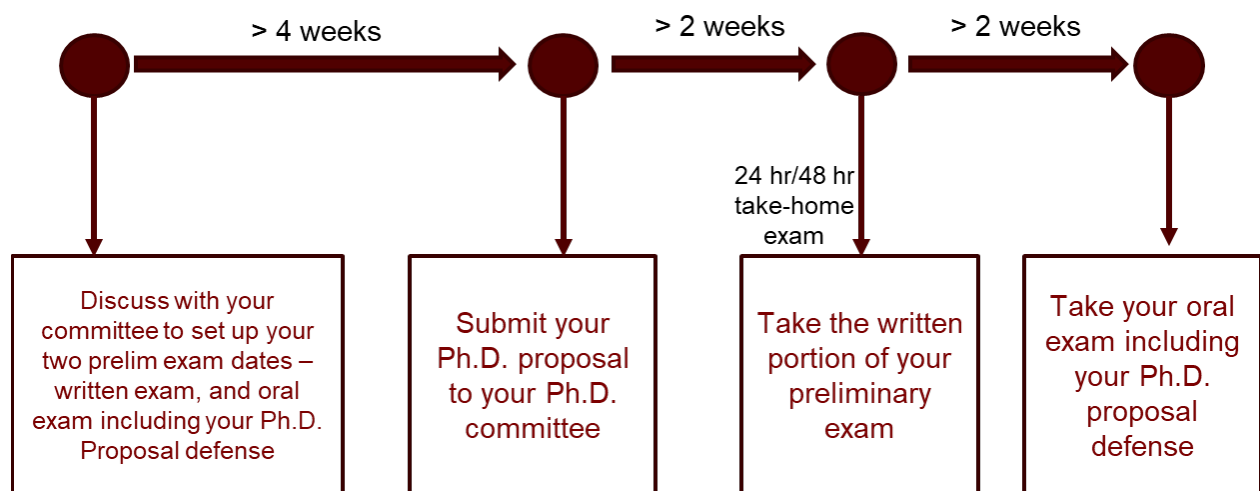


Figure 2. Typical Timeline for Prelim Exams including your Ph.D. Proposal Defense

The oral portion of the preliminary examination typically includes a question-and-answer session on the student's written exam answers. This part of the oral exam may be conducted before the student's Ph.D. proposal presentation (Type A in Figure 3) or after the presentation along with questions and answers on the students' Ph.D. proposal (Type B in Figure 3).

Type A

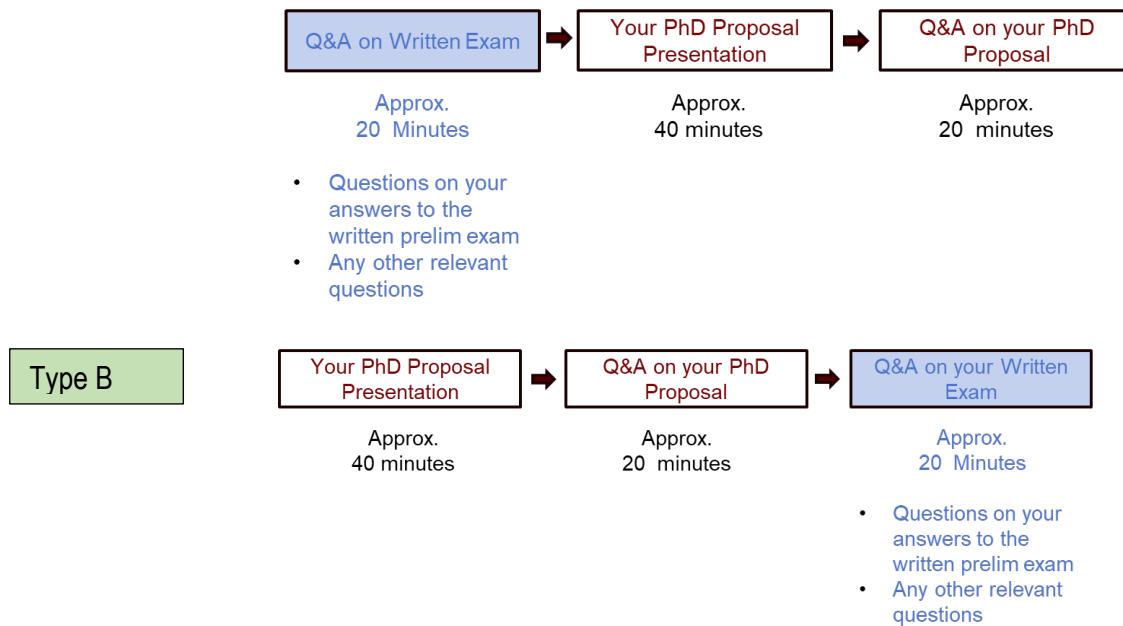


Figure 3. Oral Portion of Preliminary Examination including PhD Proposal Defense

Students may attempt the preliminary exam twice. Any students unable to pass the exam after two attempts will not be allowed to continue their Ph.D. studies. These students will be permitted to complete the MS degree in Construction Science. Forms and proposal approval forms that need to be completed can be found in appendix F.

Dissertation – Year 4

Once the committee approves the student’s dissertation proposal with successful completion of the preliminary examination, the student’s status changes to a Ph.D. candidate and the candidate will be ready to complete a dissertation in the doctoral program. A minimum of two semesters in residence is required to obtain a Ph.D. degree in Construction Science. A final examination on the student’s dissertation with an oral defense will be required of all Ph.D. students.

The Ph.D. dissertation defense date can be set up at least 14 weeks after your Ph.D. proposal is approved by the student’s committee. This policy effectively prevents a student from attempting to take the preliminary examination and the dissertation defense in the same semester. The student’s work from the dissertation is expected to result in at least three top-tier journal articles in your field. There is only one chance to defend your Ph.D. research at Texas A&M. Therefore, scheduling dissertation defense should only be considered after the student has completed all requirements for the Degree and satisfactory research.

Sample Sequence of Coursework

This section provides some guidance on a typical sequence of coursework toward the Ph.D. degree in Construction Science at Texas A&M University.

Plan of Study - Entering with a Master's Degree

A student accepted to the COSC program entering with a master's degree is required to complete a total of 60 credit hours. The expectation is to complete this requirement in a laps of 3.5 years or 4 years. The following sample course load below is just a sample of how students can distribute their course load. The actual selection of courses may vary student by student.

Fall – Year 1

Prefix and Number	Course Title	SCH
COSC 601	Construction Practices (required)	3
COSC 602	Construction Estimating (required)	3
COSC 691	Research	3
Total		9 Credit

Spring– Year 1

Prefix and Number	Course Title	SCH
COSC 603	Construction Scheduling (required)	3
COSC 690	Theory of Research (required)	3
COSC 691	Research	3
COSC 681	Seminar	1
Total		10 Credit

Fall– Year 2

Prefix and Number	Course Title	SCH
COSC 621	Advanced Project Management (required)	3
COSC 624	Data Science for the Built Environment (required)	3
COSC 691	Research	3
Total		9 Credit

Spring– Year 2

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 6XX	Elective course	3
COSC 691	Research	3
COSC 681	Seminar (required)	1
Total		10 Credit

Fall– Year3

Prefix and Number	Course Title	SCH
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COSC 6XX	Elective course	3
COSC 6XX	Elective course	3
COSC 691	Research	3
Total		9 Credit

Spring– Year 3

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 6XX	Elective course	3
COSC 691	Research	3
Total		9 Credit

Fall– Year 4 (the student is eligible to complete his or her PhD degree in this semester)

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 691	Research	3
COSC 691	Research	3
Total		9 Credit

Spring– Year 4 (additional semester if needed)

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 691	Research	3
COSC 691	Research	3
Total		9 Credit

Total graduate credit hours for the program = **60 semester hours**

Plan of Study – Entering without a B.S. Degree

A student accepted to the COSC program without a master's degree is expected to complete a total of 90 credit hours. The expectation is to complete this requirement in a laps of 5 years. The following sample course load display below is just a sample of how students can distribute their course load. The actual selection of courses may vary student by student.

Fall – Year 1

Prefix and Number	Course Title	SCH
COSC 601	Construction Practices (required)	3
COSC 602	Construction Estimating (required)	3
COSC 691	Research	3
Total		9 Credit

Spring– Year 1

Prefix and Number	Course Title	SCH
COSC 603	Construction Scheduling (required)	3
COSC 690	Theory of Research (required)	3
COSC 691	Research	3
COSC 681	Seminar	1
Total		10 Credit

Fall– Year 2

Prefix and Number	Course Title	SCH
COSC 621	Advanced Project Management (required)	3
COSC 624	Data Science for the Built Environment (required)	3
COSC 691	Research	3
Total		9 Credit

Spring– Year 2

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 6XX	Elective course	3
COSC 691	Research	3
COSC 681	Seminar (required)	1
Total		10 Credit

Fall– Year3

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 6XX	Elective course	3
COSC 691	Research	3
Total		9 Credit

Spring– Year 3

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 6XX	Elective course	3
COSC 691	Research	3
Total		9 Credit

Fall– Year 4 (the student is eligible to complete his or her PhD degree in this semester)

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 691	Research	3
COSC 691	Research	3
Total		9 Credit

Spring– Year 4 (additional semester if needed)

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 691	Research	3
COSC 691	Research	3
Total		9 Credit

Fall– Year 5

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 691	Research	3
COSC 691	Research	3
Total		9 Credit

Spring– Year 5 (the student is eligible for completing the Ph.D. Degree)

Prefix and Number	Course Title	SCH
COSC 6XX	Elective course	3
COSC 691	Research	3
COSC 691	Research	3
Total		9 Credit

Total graduate credit hours for the program = **90 semester hours**

Time Limit for Degree Completion

Students who are admitted to the Ph.D. program in Construction Science at Texas A&M University have up to 7 years to fulfill all the requirements to complete their program. The Department of Construction Science (COSC) provides guaranteed support in the form of an assistantship for up to 4 years (please refer to the

assistantship section below for more details), contingent upon the student's satisfactory performance. Beyond this period, students are expected to arrange for their own financial support.

Doctoral students have 7 years (21 semesters) to complete their doctoral degree without being penalized. After 7 years (21 semesters), any student accumulating more than 99 doctoral hours will be charged tuition at a rate equivalent to out-of-state tuition regardless of funding. Students who have been granted individual exemptions for the doctoral hour cap limit by the Texas Higher Education Coordinating Board and those students in programs which have received programmatic exemptions have 130 doctoral hours and 21 semesters before they are penalized with a higher tuition rate.

Please note that not all graduate courses are coded as doctoral courses. At the time a course is approved, the level of the course is determined by the highest level of degree in that major. In addition, the count of doctoral hours towards the 99-hour cap does not begin until a doctoral student is classified as a G8 student. Students may view their hour count through the Howdy Portal. Advisors may view the hour count in Compass at SZASSTD on the Supplemental Data tab, and the semester count can be seen by clicking on the User Defined Fields tab.

Scholarships and Fellowships

The following two sections describe the availability of financial opportunities to cover the cost of the Ph.D. program.

Texas A&M - Funding opportunities

COSC has limited funding available to support graduate students. Exceptionally qualified applicants may be offered a scholarship or fellowship as an incentive to accept admission to the Ph.D. program. The award of these scholarships and fellowships is at the discretion of the COSC Department Head and in consultation with the COSC Ph.D. Program Coordinator.

All graduate students enrolled in the Ph.D. program are eligible to apply for scholarships offered by COSC, the College of Architecture, Texas A&M University, and any other professional associations. It is the student's responsibility to review and meet application requirements and deadlines. Some of the available fellowships for graduate students are the following:

The Dr. Dionel Avilés '53 and Dr. James Johnson '67 Fellowship Program

These fellowships provide a monthly stipend amounting to \$20,000 per year for three (3) years for doctoral students and \$15,000 for two (2) years for master's students. In addition, the student receives tuition and fee payments at full-time enrollment (9 hours fall & spring, 6 hours summer, if applicable) for two (2) years for master's students or three (3) years for doctoral students. For more detailed information regarding the Avilés-Johnson Fellowship Program: <https://grad.tamu.edu/knowledge-center/funding-and-benefits/the-dr-dionel-e-aviles-53-and-dr-james-e-johnson-67-graduate-fellowship-program>.

Dissertation Fellowship

The Texas A&M University Graduate and Professional School offers a Dissertation Fellowship to support students in the dissertation phase of their degree program during the 2023-2024 academic year. This fellowship is intended to support doctoral students in the final analysis of the research topic and the final writing of the dissertation. This fellowship is **NOT** intended to finance data collection or the completion of

doctoral coursework. Priority goes to doctoral students whose primary financial support for the upcoming academic year is NOT related to their research (e.g. GANT, GAL, GAT, Self-funded). Students who have funding related to their dissertation research will be least likely to receive this fellowship. Students who anticipate graduating by December 2023 (Round 1) or May 2024 (Round 2) of the current academic year will be least likely to receive this fellowship. For more detailed information regarding the Dissertation fellowship: <https://grad.tamu.edu/knowledge-center/funding-and-benefits/dissertation-fellowships>.

External Fellowships

There are several resources available for finding graduate school fellowships. A good starting point will be to evaluate applicable opportunities listed on [the Externally-Funded Fellowship](#) list of fellowship curated by the Texas A&M Graduate and Professional School. Remember, the application process can be lengthy and competitive. It is important to start applying early and prepare a strong application. Some of the available fellowships for graduate students are the following;

NSF GRFP

The National Science Foundation (NSF) Graduate Research Fellowship program (GRFP) recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based master's and doctoral degrees at accredited US institutions. Students apply directly to and are awarded by NSF. Texas A&M receives the funding directly from NSF and the Graduate and Professional School administers the awards to the NSF GRFP fellows. NSF GRFP fellows receive a three-year annual stipend of \$37,000, payment of 100% tuition and required fees, as well as access to opportunities for professional development available to NSF-supported graduate students. Each recipient is eligible to participate in a Texas A&M University System (TAMUS) insurance program as a graduate student fellow. NSF Fellows are NOT eligible for the graduate assistant tuition payment program. <https://www.nsfgrfp.org/>

The National GEM Consortium | GEM Fellowship Program

The National GEM Consortium (GEM) offers Master's and Doctoral level students an outstanding opportunity and access to dozens of the top Engineering and Science firms and Universities in the nation. The GEM Fellowship was designed to focus on promoting opportunities for individuals to enter industry at the graduate level in areas such as research and development, product development, and other high-level technical careers. GEM also offers exposure to a number of opportunities in academia.

The deadline to apply to three GEM Member Universities is January 15th OR the relevant STEM graduate department deadline, whichever is earlier. Applicants must be admitted into a GEM Member University graduate program with confirmed department funding support before the GEM Fellowship is awarded. www.gemfellowship.org/students/gem-fellowship-program

Fulbright U.S. Student Program

The Fulbright U.S. Student Program expands perspectives through academic and professional advancement and cross-cultural dialogue. Fulbright creates connections in a complex and changing world. In partnership with more than 140 countries worldwide, the Fulbright U.S. Student Program offers unparalleled opportunities in all academic disciplines to passionate and accomplished graduating college seniors, graduate students, and young professionals from all backgrounds. Program participants pursue graduate study, conduct research, or teach English abroad. During their grants, Fulbright students will

meet, work, live with, and learn from the people of the host country, sharing daily experiences. The program facilitates cultural exchange through direct interaction on an individual basis in the classroom, field, home, and in routine tasks, allowing the grantee to gain an appreciation of others' viewpoints and beliefs, the way they do things, and the way they think. Through engagement in the community, individuals will interact with their hosts on a one-on-one basis in an atmosphere of openness, academic integrity, and intellectual freedom, thereby promoting mutual understanding. Grant lengths and dates vary by award. Please consult the specific award description for details.

Assistantship Opportunities

There are three different graduate assistantships available within COSC and these are the following:

Teaching

1. **Graduate Assistant Teaching (GAT):** GAT hired by COSC to assist faculty members in teaching courses (See appendix C).
 - International students from countries whose native language is not English must have achieved a minimum score of 80 on all sections of the ELPE before they will be considered for GAT positions.
2. **Graduate Assistant Non-Teaching (GANT):** GANT hired by COSC for tasks not directly related to teaching. These tasks might include grading, tutoring, supporting faculty on class related work, etc.

The hiring of GAT/GANT is managed by the COSC Department Head and COSC Ph.D. Program Coordinator. Available GAT/GANT positions will be advertised to all COSC graduate students as-needed. The selection and hiring process for GAT and GANT is the supervising faculty member's responsibility, along with the coordination of the COSC Department Head and COSC Graduate Program Coordinators. This may also include screening applications and conducting interviews with candidates.

Research

3. **Graduate Assistant Research (GAR):** GAR hired by individual faculty members for activities related to their funded research projects.

The selection and hiring process for GAR is managed solely by faculty members with adequate research or other sources of funding to financially support the graduate student.

Additional Resources

- The **Graduate School website** is available at <https://grad.tamu.edu/>
- The **COSC School website** available at <https://www.arch.tamu.edu/cosc/>
- The **G.R.A.D. Aggies Program** – <http://grad.tamu.edu/academics/professional-development/grad-aggies>
- The **Professional Development Opportunities** program – <https://grad.tamu.edu/professional-development>

APPENDICES

Appendix A. Core Course Waiver Form

Appendix B. Qualifying Examination Record

Appendix C. Request for Graduate Assistantship in Teaching (GAT)

Appendix D. Policy on Monitoring, Probation, and Dismissal

Appendix E. Sample Elective Courses

Appendix F. Prelim exam and Ph.D. Proposal Approval Forms

Appendix A. Core Course Waiver Form

**Construction Science
Petition for Course Waiver**



Version 1.0 (Aug. 25, 2023)

All Ph.D. students are required to complete core courses and the necessary courses in their chosen concentration area. However, they have the option to request a waiver for certain courses if they have already completed equivalent courses as part of their M.S. degree or during the later stages of their undergraduate program. Additionally, certain courses taken or anticipated to be taken during their Ph.D. program at Texas A&M University may be substituted for specific core/required courses, provided they are deemed equivalent to the said core/required courses within their Ph.D. curriculum. It is important to understand that a waiver does not result in the awarding of credit and will not be reflected on the academic transcript. Any course that is waived must be replaced with a course carrying the same number of credit hours. In other words, the minimum number of credit hours required to fulfill the Ph.D. coursework requirements remains unchanged. A successful petition for a course waiver must be accompanied by compelling evidence displaying the equivalence of the course(s) the student has taken or plans to take.

THIS SECTION TO BE COMPLETED BY STUDENT

Date:

Last Name:

First Name:

TAMU Email:

UIN:

Concentration Area:

1st Term:

Courses To Be Waived

No.	Course Number	Course Title
1		
2		
3		
4		
5		

Rationale

Provide your rationale in a separate section and attach your evidence.

Student Name

Signature

Date

THIS SECTION TO BE COMPLETED BY STUDENT ADVISOR

Courses Requested for Waiver

NO	Course Number	Course Title	Course Waiver Recommendation	
			Recommend	Do not Recommend
1			<input type="checkbox"/>	<input type="checkbox"/>
2			<input type="checkbox"/>	<input type="checkbox"/>
3			<input type="checkbox"/>	<input type="checkbox"/>
4			<input type="checkbox"/>	<input type="checkbox"/>
5			<input type="checkbox"/>	<input type="checkbox"/>

Advisor's notes:

I verify that I have carefully reviewed the course waiver petition and its evidence before making my recommendations.

Student Advisor Name

Signature

Date

Signed form should be emailed to the Graduate Office of Construction Science in a single PDF, Attn: Liz Smith (liz-smith@tamu.edu) by the student advisor.

THIS SECTION TO BE COMPLETED BY Ph.D. PROGRAM COORDINATOR

Courses Requested for Waiver

	Course Number	Course Title	Course Waiver Decision	
			Approve	Disapprove
1			<input type="checkbox"/>	<input type="checkbox"/>
2			<input type="checkbox"/>	<input type="checkbox"/>
3			<input type="checkbox"/>	<input type="checkbox"/>
4			<input type="checkbox"/>	<input type="checkbox"/>
5			<input type="checkbox"/>	<input type="checkbox"/>

Ph.D. Program Coordinator's notes:

I verify that I have carefully reviewed the course waiver petition and its evidence before making the final decision.

Ph.D. Program Coordinator

Signature

Date

THIS SECTION TO BE COMPLETED BY STUDENT

Rationale for Course Waiver:

Provide your rationale for each course you are requesting for a waiver and attach evidence such as your transcript, course syllabus, course description, etc.

Course Number	Course Title

Rationale for Course Waiver:

Provide your rationale for each course you are requesting for a waiver and attach evidence such as your transcript, course syllabus, course description, etc.

Course Number	Course Title

THIS SECTION TO BE COMPLETED BY STUDENT

Rationale for Course Waiver:

Provide your rationale for each course you are requesting for a waiver and attach evidence such as your transcript, course syllabus, course description, etc.

Course Number	Course Title

Rationale for Course Waiver:

Provide your rationale for each course you are requesting for a waiver and attach evidence such as your transcript, course syllabus, course description, etc.

Course Number	Course Title

THIS SECTION TO BE COMPLETED BY STUDENT

Rationale for Course Waiver:

Provide your rationale for each course you are requesting for a waiver and attach evidence such as your transcript, course syllabus, course description, etc.

Course Number	Course Title

Rationale for Course Waiver:

Provide your rationale for each course you are requesting for a waiver and attach evidence such as your transcript, course syllabus, course description, etc.

Course Number	Course Title

Appendix B. Qualifying Examination Record

Construction Science Qualifying Examination Record



All Ph.D. students are required to take a qualifying exam within the first three regular semesters of matriculation into the program or earlier. However, an extension of one semester may be allowed with the approval of the student's advisor. They must have taken COSC690: Theory of Research in Construction Science and fulfilled at least 50% of the required courses to take a qualifying exam. The qualifying exam is to be administered by the student's committee and must first be approved by the Ph.D. Program Coordinator of the Department of Construction Science. The student will submit a research paper to his/her Ph.D. qualifying exam committee of three construction science faculty members. The student's advisor will serve as the chair of the committee. One member of the committee must be assigned by the Ph.D. program coordinator. The committee will review the student's qualifying paper and oral presentation using the five evaluation criteria available in this form. The committee may, at their discretion but with approval from the Ph.D. Program Coordinator, choose to accept the student's successful passing of another degree program's qualifying exam to satisfy this requirement.

THIS SECTION TO BE COMPLETED *at least two-weeks* BEFORE TAKING QUALIFYING EXAM

Last Name: _____ First Name: _____ UIN: _____
TAMU Email: _____ 1st Term: _____
Concentration Area: _____ Date Qualifier Scheduled: _____
Overall Grad GPA: _____

1st attempt at the qualifying exam? Yes No If NO, date of last exam: _____

Student Checklist

Qualifying Paper has been emailed by Chair to Liz Smith, liz-smith@tamu.edu

Student Name	Signature	Date
--------------	-----------	------

Committee Chair Name	Signature	Date
----------------------	-----------	------

Ph.D. Program Coordinator	Signature	Date
---------------------------	-----------	------

Submit printed, signed form to the Office of Construction Science, Attn: Liz Smith

THIS SECTION TO BE COMPLETED DURING AND AFTER QUALIFYING EXAM IS TAKEN

Signed form should be delivered to the Graduate Office of Construction Science, Attn: Liz Smith (liz-smith@tamu.edu), or pickup requested within one week from exam date. **Form should not be given directly to the student.**

Qualifying Exam Evaluation Criteria:

The student has demonstrated an ability to

a) build a sound research problem or a research hypothesis,	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent
b) conduct a comprehensive literature review by synthesizing information gathered, and identifying the state of the art and clear gaps,	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent
c) build a scientific research methodology,	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent
d) conduct evidence-based research to solve the research problem or test the research hypothesis, and	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent
e) present the research results in a professional manner with discussions and future research directions.	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent

Department: Exam Results: Passed Failed

Report of Qualifying Exam Completion

I verify that I have conducted the qualifying examination of:

On:

Committee Chair Name **Signature** **Date**

Committee Member Name **Signature** **Date**

Committee Member Name **Signature** **Date**

Ph.D. Program Coordinator **Signature** **Date**

RECEIVED BY COSC ON:

ADDITIONAL NOTES:

Appendix C. Request for Graduate Assistantship in Teaching (GAT)

**Construction Science
Request for Graduate Assistantship in Teaching (GAT)
(Ph.D. students)**



Version 1.0 (Oct. 30th, 2023)

Submission deadlines for this request are **July 15 for the fall semester, November 15 for the spring semester, and March 15 for the summer semester.**

All appointments starting in the Fall semester are initially made for an academic year. The appointment may be terminated if the student fails to meet satisfactory performance standards set by the course instructor and agreed upon by the hired GAT.

Important Note: Ph.D. students are generally not recommended to work as GATs for more than two semesters during their Ph.D. program. However, exceptions may be warranted on a case-by-case basis with strong justifications.

Ph.D. Student Requested for GAT Appointment

Name: _____ UIN: _____

Course Number and Name to be assigned

Course Number: _____ Course Name: _____

Employment Year and Semester

Year: _____ Semester: Spring / Summer / Fall

Instructor of the Course

I understand that this GAT appointment is at 37.5% FTE (15 hours per week).

Name: _____

Signature: _____ Date: _____

Advisor of the Ph.D. Student

I understand that this GAT appointment is at 37.5% FTE and I agree to hire the student at 12.5% FTE (5 hours per week) GAR from my funding account(s) during the student's GAT appointment.

Name: _____

Signature: _____ Date: _____

Ph.D. Program Coordinator

I confirm the student's good academic standing and ethical integrity (no cheating and/or ethics violation record), following consultation with the Assistant Department Head. I approve the student's GAT appointment.

Name: _____

Signature: _____ Date: _____

Appendix D. Policy on Monitoring, Probation, and Dismissal

Grade Point Average (GPA) Requirements

All graduate students have two GPAs, and both must be at least 3.0 to be in good standing, to conduct any type of exam, and to graduate. Course levels included in the GPAs are 300, 400, 600, 700, and 900. Courses NOT included in the GPAs are transfer courses and 100-200 level courses. See Student Rule 10.4.3.

- Degree Plan GPA – includes only courses listed on the degree plan except transfer course work.
- Cumulative GPA (Program GPA) – includes all graduate level course work completed at TAMU.

Scholastic Requirements

Unless otherwise stated, students in graduate degree programs and post-baccalaureate non-degree students (G6 classification) must maintain a 3.00 cumulative GPA (computed as specified in Student Rule 10.4.3). Degree-seeking students also must maintain a GPA of at least 3.00 on all courses listed on the degree plan. Departments and colleges may establish higher GPA requirements for their students in graduate degree programs and for post-baccalaureate nondegree students (G6 classification).

A graduate student will not receive graduate degree credit for undergraduate courses taken on a satisfactory / unsatisfactory (S/U) basis. A graduate student may not receive grades other than satisfactory (S) or unsatisfactory (U) in graduate courses bearing the numbers 681, 684, 690, 691, 692, 693, 695, 697 and 791 (except for ALEC 695, BUAD 693, AGECE 695, GEOG 695, and IBUS 692). These officially designated S/U courses may be listed on the degree plan, along with other courses approved and noted as S/U in the graduate catalog. Graduate courses not on the degree plan may be taken on an S/U basis.

Only grades of A, B, C, and S are acceptable for graduate credit. Grades of D, F, or Unsatisfactory (U) for courses on the degree plan must be absolved by repeating the courses and achieving grades of C or above or Satisfactory (S). If a course has been taken more than once and a grade of D or F was earned and then repeated for a grade of C or higher, the original grades of D or F will be excluded from the GPA calculation for the degree plan (if applicable) and cumulative GPA, but remain on the student's permanent record. A course in which the final grade is C may be repeated for a higher grade. If the second grade is higher, the original grade will be excluded from the GPA calculation for the degree plan (if applicable) and cumulative GPA but remain on the student's permanent record.

Monitoring

Students are expected to maintain a cumulative grade point average (GPA) of at least 3.00 /4.00 with no grade less than "B" and earn grades of "Satisfactory" in core courses and dissertation research credit hours.

If a student has a semester GPA less than 2.75/4.00 or a cumulative GPA less than 3.00/4.00, a letter will be drafted by the department head to the student, with a copy to the major professor, to the Graduate School, and to the student's file, indicating the last semester was determined unsatisfactory and that they are being placed on probation.

Probation

If a student's semester GPA falls below 2.75/4.00 or if a student's cumulative GPA falls below 3.00/4.00, the student will be placed on academic probation. The student will have two semesters to raise their cumulative GPA to the required level and return to good standing. If they do not, they will not be able to register for classes

the subsequent semester and will be dismissed from the program. Eligibility for an assistantship while on probation will be left to the School/Department Head's discretion.

Dismissal

A student will be dismissed from the program if they remain on probation for two consecutive semesters without improvement. In other words, if a student's semester GPA is below 2.50/4.00 or if a student's cumulative GPA falls below 2.75/4.00, the student will be immediately dismissed from the program. This policy is independent of any assistantship the student may hold.

Appendix E. Sample Elective Courses

Prefix and Number	Prescribed Elective Course Title	SCH
AT LEAST 18 SCH NOT PREVIOUSLY TAKEN (WITH CHAIR APPROVAL)		
Courses Offered by Construction Science:		
COSC 606	Electrical and Mechanical Construction	3
COSC 608	Structural Principles and Practice	3
COSC 620	Construction Company Operations	3
COSC 621	Advanced Project Management	3
COSC 622	Construction Economics	3
COSC 624	Construction Accounting and Financial management	3
COSC 628	Law and Risk Management	3
COSC 631	Advanced Construction Productivity and Lean	3
COSC 642	Construction Info Technology	3
COSC 644	Advanced Construction Systems	3
COSC 648	Graduate Capstone	3
COSC 650	Construction Visualization	3
COSC 663	Sustainable Construction	3
COSC 670	Facility Asset Management	3
COSC 685	Directed Studies (not more than 6 SCH)	var.
COSC 689	Special Topics (not more than 6 SCH)	3
COSC 689-xxx	Data Science for the Built Environment	3
COSC 689-xxx	Advanced Construction Safety and Health Management	3
COSC 689-xxx	Life Cycle Assessment in Building Construction	3
COSC 689-xxx	CII Best Practices	3
Courses Offered by Other Departments:		
ACCT 640	Accounting	3
ARCH 620	Building Performance Measurement	3
ARCH 622	Sustainable Building Design Technology	3
ARCH 675	Health Design and Research	3
CSCE 625	Artificial Intelligence	3
CSCE 629	Analysis of Algorithms	3
CSCE 633	Machine Learning	3
CSCE 636	Deep Learning	3
CSCE 676	Data Mining and Analysis	3
CVEN 624	Infrastructure Engineering and Management	3
CVEN 638	Computer Integrated Construction Engineering Systems	3
CVEN 639	Methods Improvement for Construction Engineers	3
CVEN 640	Construction Engineering Systems	3
CVEN 641	Project Development: Methods and Models	3
CVEN 644	Project Risk Management	3
CVEN 654	Strategic Construction and Engineering Management	3
CVEN 668	Advanced EPC Project Development	3
CVEN 710	Civil Engineering Project Finance	3
CVEN 717	Engineering Project Control	3
FINC 635	Finance	3

Prefix and Number	Prescribed Elective Course Title	SCH
LDEV 663	Introduction to Project Management	3
LDEV 672	Public-Private Project Funding	3
MATH 606	Theory of Probability I	3
MATH 609	Numerical Analysis	3
MATH 619	Applied Probability	3
MATH 645	A Survey of Math Problems	3
MGMT 655	Management	3
MKTG 621	Marketing	3
PLAN 612	Transportation in City Planning	3
PLAN 616	Analyzing Risk/Hazard and Public Policy	3
PLAN 625	Geographic Information Systems in Landscape & Urban Planning	3
PLAN 626	Advanced GIS in Landscape Architecture & Urban Planning	3
PLAN 647	Disaster Recovery and Hazard Mitigation	3
PLAN 649	Organizational and Community Response to Crises and Disasters	3
PLAN 650	Disaster Response Planning	3
PLAN 669	Urban Infrastructure Planning	3
PLAN 674	Transportation System Analysis	3
PLAN 676	Transportation Investment Decisions	3
STAT 610	Theory of Statistics - Distribution Theory	3
STAT 614	Probability for Statistics	3
STAT 624	Database and Computational Tools Used in Big Data	3
STAT 639	Data Mining and Analysis	3
STAT 651	Statistics in Research I	3
STAT 652	Statistics in Research II	3
VIZ 615	Computer Animation	3
VIZ 672	Computer Graphics	3
VIZ 673	Robotics Programming	3
VIZ 676	Data Visualization	3
VIZ 677	Virtual Reality	3

Appendix F. Prelim Exam and Ph.D. Proposal Approval Forms

Prelim exam form

<https://grad.tamu.edu/knowledge-center/forms/preliminary-examination-checklist-and-report>

[https://grad.tamu.edu/getmedia/df87bc61-5c13-4ff8-b8f3-70112abed576/DocuSign-Preliminary-Examination-Checklist-and-Report-of-Examination\(watermark\).pdf](https://grad.tamu.edu/getmedia/df87bc61-5c13-4ff8-b8f3-70112abed576/DocuSign-Preliminary-Examination-Checklist-and-Report-of-Examination(watermark).pdf)

Ph.D. Proposal Approval form

<https://grad.tamu.edu/knowledge-center/forms/research-proposal-approval-form>

[https://grad.tamu.edu/getmedia/fc7694b1-3616-4665-8306-0be44767a009/DocuSign-Research-Proposal-Approval-Form\(watermark\).pdf](https://grad.tamu.edu/getmedia/fc7694b1-3616-4665-8306-0be44767a009/DocuSign-Research-Proposal-Approval-Form(watermark).pdf)