Program Overview
The master's degree is increasingly becoming the degree of choice among Construction Managers as the field becomes more technologically advanced and the industry more complex with governmental regulations. The purpose of the Construction Management master’s degree program is to provide advanced project management principles and practices, critical thinking and creativity, and complex problem solving and decision making in construction projects as a specialized program for working construction professionals and others seeking master’s level preparation. Further, the program will provide students with the skills to integrate information and communication technology in Construction Management.

Application Requirements
The items listed below are required for admission consideration for applicable semesters of entry during the current academic year. Submission instructions, additional details, and changes to admission requirements for semesters other than the current academic year can be found on The Graduate College’s website (http://www.gradcollege.txstate.edu). International students should review the International Admission Documents webpage (http://mycatalog.txstate.edu/graduate/admission-documents/international/) for additional requirements.

- completed online application
- $55 nonrefundable application fee
  or
- $90 nonrefundable international evaluation fee (if applicable)
- baccalaureate degree (or equivalent) from an accredited college or university in construction related degree. Graduates of curricula outside these program areas may be required to satisfy program prerequisite before full admission into the program
- official transcripts from each institution where course credit was granted
- a competitive GPA in the last 60 hours of undergraduate course work (plus any completed graduate courses)
- knowledge of Construction Management demonstrated through previous coursework and/or work experience
- responses to specific essay questions on the statement of purpose
- resume/CV detailing work experience, extracurricular and community activities, and honors and achievements
- two letters of recommendation from persons best able to assess the student's ability to succeed in graduate school

Applicants should refer to The Graduate College website for additional information regarding the admission process.

TOEFL, PTE, or IELTS Scores
Non-native English speakers who do not qualify for an English proficiency waiver:
- official TOEFL iBT scores required with an 78 overall
- official PTE scores required with a 52
- official IELTS (academic) scores required with a 6.5 overall and minimum individual module scores of 6.0

This program does not offer admission if the scores above are not met.

Degree Requirements
The Master of Science (M.S.) degree with a major in Construction Management requires 30 semester credit hours, including a thesis.

Course Requirements

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<th>Code</th>
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<th>Hours</th>
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Prescribed Electives
Choose 3 hours from the following:
- CSM 5360 Construction Company Financial Control
- CSM 5363 Construction Project Delivery and Leadership
- CSM 5365 Construction Project Controls
- CSM 5367 Principles of Leadership in Construction
- CSM 5380 Construction Safety Management
- CSM 5384A Construction Failure

Thesis
- CSM 5399A Thesis

Choose a minimum of 3 total hours from the following:
- CSM 5199B Thesis
- CSM 5299B Thesis
- CSM 5599B Thesis
- CSM 5999B Thesis

Total Hours 30

Comprehensive Examination
All candidates for graduate degrees must pass one or more comprehensive examinations, either written, oral, or both, covering at least the field of concentration and the thesis.

If a student elects to follow the thesis option for the degree, a committee to direct the written thesis will be established. The thesis must demonstrate the student's capability for research and independent thought. Preparation of the thesis must be in conformity with the Graduate College Guide to Preparing and Submitting a Thesis or Dissertation.

The student must submit an official Thesis Proposal Form (http://www.gradcollege.txstate.edu/forms.html) and proposal to his or her thesis committee. Thesis proposals vary by department and discipline. Please see your department for proposal guidelines and requirements. After signing the form and obtaining committee members' signatures,
the graduate advisor's signature if required by the program and the
department chair's signature, the student must submit the Thesis
Proposal Form with one copy of the proposal attached to the dean of The
Graduate College for approval before proceeding with research on the
thesis. If the thesis research involves human subjects, the student must
obtain exemption or approval from the Texas State Institutional Review
Board prior to submitting the proposal form to The Graduate College.
The IRB approval letter should be included with the proposal form. If
the thesis research involves vertebrate animals, the proposal form must
include the Texas State IACUC approval code. It is recommended that the
thesis proposal form be submitted to the dean of The Graduate College
by the end of the student's enrollment in 5399A. Failure to submit the
thesis proposal in a timely fashion may result in delayed graduation.

Thesis Committee

The thesis committee must be composed of a minimum of three
approved graduate faculty members.

Thesis Enrollment and Credit

The completion of a minimum of six hours of thesis enrollment is
required. For a student's initial thesis course enrollment, the student will
need to register for thesis course number 5399A. After that, the student
will enroll in thesis B courses, in each subsequent semester until the
thesis is defended with the department and approved by The Graduate
College. Preliminary discussions regarding the selection of a topic and
assignment to a research supervisor will not require enrollment for the
thesis course.

Students must be enrolled in thesis credits if they are receiving
supervision and/or are using university resources related to their thesis
work. The number of thesis credit hours students enroll in must reflect
the amount of work being done on the thesis that semester. It is the
responsibility of the committee chair to ensure that students are making
adequate progress toward their degree throughout the thesis process.
Failure to register for the thesis course during a term in which supervision
is received may result in postponement of graduation. After initial
enrollment in 5399A, the student will continue to enroll in a thesis B
course as long as it takes to complete the thesis. Thesis projects are by
definition original and individualized projects. As such, depending on the
topic, methodology, and other factors, some projects may take longer
than others to complete. If the thesis requires work beyond the minimum
number of thesis credits needed for the degree, the student may enroll in
additional thesis credits at the committee chair's discretion. In the rare
case when a student has not previously enrolled in thesis and plans to
work on and complete the thesis in one term, the student will enroll in
both 5399A and 5399B.

The only grades assigned for thesis courses are PR (progress), CR
(credit), W (withdrew), and F (failing). If acceptable progress is not being
made in a thesis course, the instructor may issue a grade of F. If the
student is making acceptable progress, a grade of PR is assigned until
the thesis is completed. The minimum number of hours of thesis credit
("CR") will be awarded only after the thesis has been both approved by
The Graduate College and released to Alkek Library.

A student who has selected the thesis option must be registered for the
thesis course during the term or Summer I (during the summer, the thesis
course runs ten weeks for both sessions) in which the degree will be
conferred.

Thesis Deadlines and Approval Process

Thesis deadlines are posted on The Graduate College (http://
www.gradcollege.txstate.edu/) website under "Current Students." The
completed thesis must be submitted to the chair of the thesis committee
on or before the deadlines listed on The Graduate College website.

The following must be submitted to The Graduate College by the thesis
deadline listed on The Graduate College website:
1. The Thesis Submission Approval Form bearing original (wet) and/or
electronic signatures of the student and all committee members.
2. One (1) PDF of the thesis in final form, approved by all committee
members, uploaded in the online Vireo submission system.

After the dean of The Graduate College approves the thesis, Alkek
Library will harvest the document from the Vireo submission system for
publishing in the Digital Collections database (according to the student's
embargo selection). NOTE: MFA Creative Writing theses will have a
permanent embargo and will never be published to Digital Collections.

While original (wet) signatures are preferred, there may be situations as
determined by the chair of the committee in which obtaining original
signatures is inefficient or has the potential to delay the student's
progress. In those situations, the following methods of signing are
acceptable:

• signing and faxing the form
• signing, scanning, and emailing the form
• notifying the department in an email from their university's or
institution's email account that the committee chair can sign the form
on their behalf
• electronically signing the form using the university's licensed
signature platform.

If this process results in more than one document with signatures, all
documents need to be submitted to The Graduate College together.

No copies are required to be submitted to Alkek Library. However, the
library will bind copies submitted that the student wants bound for
personal use. Personal copies are not required to be printed on archival
quality paper. The student will take the personal copies to Alkek Library
and pay the binding fee for personal copies.

Courses Offered

Construction Science and Management (CSM)

CSM 5199B. Thesis.

This course represents a student's continuing thesis enrollment. The
student continues to enroll in this course until the thesis is submitted for
binding.

1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing

Grade Mode: Credit/No Credit
CSM 5299B. Thesis.
This course represents a student's continuing thesis enrollment. The student continues to enroll in this course until the thesis is submitted for binding.

3 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

This course introduces students to the legal aspects of design and construction contract documents, including dispute resolution methods and professional ethics commonly used in the construction industry. This course does not earn graduate degree credit.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from Graduate GPA|Leveling
Grade Mode: Leveling/Assistantships

This course provides the student with a comprehensive introduction to the principles, techniques, technologies, and basic concepts involving methodologies and strategies used in the preparation of various types of construction estimates and bids. This course does not count as degree credit.

3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Exclude from Graduate GPA|Leveling
Grade Mode: Leveling/Assistantships

This course is a commercial building construction systems class dealing with soils, site work, heavy foundations, steel, reinforced concrete, precast structures and common assemblies. Commercial MEPs are studied along with CSI master format, as-built/shop drawings, schedule of values, AIA documents, and appropriate building codes. This course does not earn graduate degree credit.

3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Exclude from Graduate GPA|Leveling
Grade Mode: Leveling/Assistantships

CSM 5313. Building Information Modeling.
This course covers understanding the supervisory role of construction professionals in the design process including, directing a design team in the integration of construction documents for commercial buildings, coordination of site work, structural, architectural, mechanical, electrical, plumbing plans and contemporary CAD software for 2D& 3D design including Building Information Modeling. Prerequisite: CSM 2313 with a grade of "D" or better or instructor approval.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

CSM 5314. Technology Management in Construction.
This course covers the supervisory role of construction professionals in the Virtual Design and Construction (VDC) process. Topics covered include directing a VDC team in the integration of construction documents for construction (architectural, structural, mechanical, electrical, and plumbing plans), coordination of site work, implementation of current CAD software for 2D and 3D design, the Building Information Modeling (BIM) process, and other technologies that have an impact on the construction industry.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

CSM 5360. Construction Company Financial Control.
Financial accounting and cost controls used at the company level in construction companies are studied. Topics include accounting systems, construction project profit calculations, and financial analysis.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

CSM 5362. Pre-Construction Services.
The course will introduce students to designer/contractor interactions, including conceptual estimating and scheduling, the RFQ/RFP process and legal, insurance, risk allocation issues, along with procurement and selection.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

CSM 5363. Construction Project Delivery and Leadership.
This course covers methods of construction project delivery in detail and focuses on analyzing data to assess its impact on project outcomes. Construction project delivery is covered along with contract strategies. An owner approach to a method selection is developed within this class.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

CSM 5364. Decision Making in Construction Management.
This course focuses on the application of systems engineering and statistics used in solving construction and civil engineering problems. Topics covered include network and linear programming models, construction and evaluation of decision trees to clarify a proper course of action considering uncertainty, probability distributions, sample statistics, linear regression models, risk analysis, and sampling plans for quality assurance. Personal computer usage emphasized for problem solving.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

CSM 5365. Construction Project Controls.
This course covers construction management cost and schedule concepts, cost/schedule management information systems, variance analysis, forecasting, resource management, project recovery strategies, and application of theory to practical problems.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
CSM 5366. Soils in Construction.
This course provides students with an in-depth examination of geotechnical principles as they apply to soil construction activities. Topics covered include geological formations of natural soils, soil mineralogy, soil sampling, classification, soil testing, dewatering, safety and sustainability in soil construction, soil contamination and remediation, recycled content used in soil construction and innovative technologies in soil stabilization.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

This course covers individual, organizational, and process/structure styles of leadership using a transformational model.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

CSM 5368. Sustainable Construction.
This course examines a breadth of sustainable construction techniques, including material production, material selection, sustainable design, the ecology model for design, life cycle cost analysis, and sustainable construction. The sustainable construction techniques are discussed relative to advanced sustainable framing, waste minimization techniques, LEED, and green roofs.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

CSM 5369. Construction Dispute Resolution.
This course focuses on different mechanisms of dispute resolution in the industry. They are presented from the perspective of owner, designer, and contractor's liability/risk assessment. The course is comprised of best practices and pitfalls of negotiation, mediation and arbitration. Finally, a perspective on litigation is discussed, along with the fast changing world of case law. The course uses a collaborative model of contemporary research and industry case studies.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

CSM 5380. Construction Safety Management.
This course covers the administration and application of 29CFR 1926 OSHA Construction Industry Regulations for the construction industry along with applicable state and federal construction safety laws related to construction, alterations, or repair work at construction sites. The roles of all participants at the construction job site concerning construction safety are discussed.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
Technology (TECH)

TECH 5100. Academic Instruction for Technology.
The course is seminar based and covers topics related to teaching and employment responsibilities. Completion of this course is required as a condition of employment for graduate assistants. This course does not earn graduate degree credit. Repeatable with different emphasis.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Course Attribute(s): Graduate Assistantship Exclude from Graduate GPA
Grade Mode: Leveling/Assistantships

TECH 5195. Industrial Internship.
This course is a supervised experiential learning course in Technology Management. This work integrated learning course helps the student link theory with practice. Repeatable for credit. Prerequisites: Instructor approval.
1 Credit Hour. 0 Lecture Contact Hours. 4 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

TECH 5199B. Thesis.
This course represents a student’s continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

TECH 5299B. Thesis.
This course represents a student’s continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding.
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

TECH 5300. Academic Instruction for Graduate Instructional Assistants.
This course is designed to develop and enhance the professional and technical skills of graduate instructional assistants. Topics covered may include, but are not limited to, teaching skills, technical skills, ethical and legal issues, safety, and laboratory management. This course does not earn graduate degree credit.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Graduate Assistantship Exclude from Graduate GPA
Grade Mode: Leveling/Assistantships

TECH 5310. Product Design and Development.
This course provides an overview of the new product realization process, focusing on systematic product design, including problem identification, product planning, conceptual design, and embodiment design. Standard CAD tools are employed for product modeling.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

This course teaches the application of computer hardware and software to the design of products and of systems. Specific topics include geometric modeling, the development of computational methods, and an overview of engineering analysis software. Additional topics may include finite element analysis, manufacturing simulation, solidification modeling, and rapid prototyping.
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

TECH 5315. Engineering Economic Analysis.
This course covers economic analytical techniques used in engineering decision-making. Topics include time-value of money, comparing alternatives, depreciation, replacement, and income tax considerations.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

Provides the student with in-depth knowledge of inferential statistics as applied to design of robust processes and products. Topics covered include probability distributions, ANOVA, fractional factorial design, response surface method, orthogonal arrays, and Taguchi method. Prior experience with introductory-level statistics is assumed. Prerequisite: TECH 5394 with a grade "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 5365. Industrial Project Management and Scheduling.
This course introduces students to industrial management system concepts and applications relating to management operations, system design, implementation and management, case studies of practices, and application of theory to practical problems.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 5368. Principles of Information and Communication Technology Management.
This course, in a case-based learning environment, integrates concepts and principles of information and communication technology (ICT) including mobile communication and Internet of Things (IoT). Analysis and evaluation of advanced ICT management examples demonstrate issues and strategies of modern ICT management.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 5382. Industrial Ecology and Sustainability Engineering.
This course covers the principles of life cycle analysis (LCA) of engineered products and processes. Topics include industrial ecology, resource depletion, product design, process design, material selection, energy efficiency, product delivery, use, and end-of-life considerations.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TECH 5384. Problems in Technology.
In this course graduate students investigate a particular topic by developing a technical problem, researching the topic, and presenting the findings. Plans will be developed on an individual basis with strict faculty supervision. It may be repeated for credit with the permission of the department chair. Prerequisite: Instructor approval.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

TECH 5385. Readings in Technology.
A study of the ethical and moral viewpoints typically associated with American society as related to the development and introduction of new technology and engineering. Past, present, and future issues will be studied with selected readings focusing on industrial related problems and issues.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 5387. Advanced Facilities Planning.
This course is an in-depth study of technical problems encountered in designing, equipping, arranging, and specifying facility requirements for industrial and technical training facilities.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 5390. Research in Technology.
This course examines the scientific method, including theory formulation, deductive reasoning, hypothesis generation, observation, inductive reasoning, and theory revision. Categories of research are compared and contrasted as regards methodology. Experimental research relating to significant industrial problems, including design considerations, internal and external validity, and appropriate analytical techniques, is studied in-depth. The course includes an introduction to data analysis and its proper interpretation.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

TECH 5391. Advanced Manufacturing Systems.
This course introduces various advanced tools, technologies, and strategies in modern manufacturing. Topic coverage emphasizes state-of-the-art in factory automation, as well as global and smart manufacturing enterprises. Specific topics include process automation and control, advanced manufacturing processes, intelligent manufacturing control, and information and communication technology (ICT) in manufacturing.
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Grade Mode: Standard Letter

This course is an introduction to integrated circuit fabrication. Topics include crystal growth, wafer preparation, epitaxial growth, oxidation, diffusion, ion implantation, thin film deposition, lithography, etching, device and circuit formation, packaging, and testing. A significant part of the course is a project focusing on circuit design and simulation or on process design. Laboratory component involves the actual production and testing of a functional semiconductor device.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 5394. Design of Industrial Experiments.
This course covers fundamentals of designing industrial experiments.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 5395A. Structure and Properties of Alloys.
This course is an advanced exploration of the structure and properties of engineering alloys. Strengthening mechanisms of alloys are explored with specific applications to the alloys studied. The processing, properties, and structure of ferrous and nonferrous alloys are explored including new and emerging alloys. Prerequisite: Instructor approval.
3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

TECH 5396. Directed Project.
This course is a formal investigation into a business or industry problem. The directed project is an applied research project that is more extensive than an independent study and less extensive than a thesis. The course culminates in a detailed project report and oral presentation. Prerequisite: TECH 5394 with a grade of "C" or better and instructor approval.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

TECH 5398. Directed Project.
This course represents a student's initial thesis enrollment. No thesis credit is awarded until student has completed the thesis in Technology 5399B.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

TECH 5399A. Thesis.
This course represents a student's continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
TECH 5599B. Thesis.
This course represents a student's continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding.
5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

TECH 5999B. Thesis.
This course represents a student's continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding.
9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit