# COSC - Construction Science

## Courses

COSC 153 Introduction to the Construction Industry  
**Credits:** 3.3 **Lecture Hours.**  
Characteristics of the construction industry; types of construction companies; contracts; people involved in a project, their responsibilities and interrelationships; evolution of a project; interpreting working drawings; construction bonds; contract documents.

COSC 175 Construction Graphics Communication  
**Credits:** 3.3 **Lecture Hours.**  
Visualization, interpretation and communication of graphical geometry in construction design and engineering; graphical analysis of problems; sketching applications, computer aided design, and fundamentals of information modeling software; introduction to common quantitative tools in construction.  
**Prerequisite:** COSL majors only.

COSC 253 Construction Materials and Methods I  
**Credits:** 3.3 **Lecture Hours.**  
(ARCH 2312) Construction Materials and Methods I. Materials, methods and sequences of the construction process; emphasis on design, specification, purchase and use of concrete, masonry and wood.

COSC 254 Construction Materials and Methods II  
**Credits:** 3.3 **Lecture Hours.**  
(ARCH 2313) Construction Materials and Methods II. Analysis of materials and methods used in the design and construction of buildings with a particular emphasis on structures using structural steel reinforced concrete and dimensional framing lumber.  
**Prerequisite:** COSC 253.

COSC 275 Estimating I  
**Credits:** 3.2 **Lecture Hours.**  
Systems approach to determining required quantities of construction materials; quantification of various types of foundation systems, structural systems and building envelope systems; excerpts of contract documents from a variety of different building projects.  
**Prerequisites:** COSC 175; COSC 254.

COSC 284 Introduction to Applied Workplace Ethics, Etiquette and Communications  
**Credits:** 3.3 **Lecture Hours.**  
For students in an experiential learning environment; required reading assignments on topics concerning workplace ethics, etiquette and communications; apply and discuss reflective writing assignments in order to prepare to meet the professional expectations of employers upon graduation.  
**Prerequisite:** Engaged in an internship, co-op or other experiential learning opportunity working a minimum of 20 hours per week.

COSC 285 Directed Studies  
**Credits:** 1 to 3.1 to 3 **Other Hours.**  
Special project in construction science. Project must be approved by the department.  
**Prerequisite:** Approval of department head.

COSC 291 Research  
**Credits:** 1 to 4.1 to 4 **Other Hours.**  
Research conducted under the direction of faculty member in construction science. May be repeated 2 times for credit.  
**Prerequisites:** Freshman or sophomore classification; approval of instructor.

COSC 301 Construction Surveying  
**Credits:** 2.0 **Lecture Hours.**  
Practical applications of surveying to the practice of construction project management; distance, grade and angular measurement; surveying equipment and its application to construction layout and control; surveying documentation and field work; introduction to other three dimensional measurement and positioning systems.  
**Prerequisite:** Admission to upper level in Construction Science.

COSC 321 Structural Systems I  
**Credits:** 3.3 **Lecture Hours.**  
Introduction to the physical principles that govern classical statics and strengths of materials through the design of architectural structures.  
**Prerequisite:** Admission to upper level in Construction Science.

COSC 323 Soils in Construction  
**Credits:** 2.1 **Lecture Hour.**  
Introduction to soils as used in construction projects; engineering properties, soil classification, soil exploration, embankment control, dewatering, excavation supports, foundations.  
**Prerequisite:** Admission to upper level in Construction Science.

COSC 325 Mechanical, Electrical and Plumbing Systems in Construction I  
**Credits:** 3.3 **Lecture Hours.**  
Design, operation, materials and installation methods of mechanical, electrical and plumbing systems in construction.  
**Prerequisite:** Admission to upper level in Construction Science.

COSC 326 Mechanical, Electrical and Plumbing Systems in Construction II  
**Credits:** 3.3 **Lecture Hours.**  
In depth coverage of mechanical, electrical and plumbing (MEP) system operations, materials and installation methods; development of MEP drawings, specifications and contract documents as used in MEP specialty contracting industry.  
**Prerequisite:** COSC 325.

COSC 351 Construction Equipment and Methods  
**Credits:** 3.3 **Lecture Hours.**  
Management principles of construction equipment selection, operation and safety; development of skills necessary to select an equipment mix that yields maximum productivity and best value.  
**Prerequisite:** COSC 323.

COSC 353 Construction Project Management  
**Credits:** 3.3 **Lecture Hours.**  
An introduction to construction project management covering concepts of project selection, estimating bidding, scheduling, subcontracting practices, cost controls, project documentation, construction bonds, insurance, payments and the elements of close out; development of professional communication skills through prepared multi-media presentations.  
**Prerequisite:** Admission to upper level in Construction Science.

COSC 364 Construction Safety I  
**Credit:** 1.1 **Lecture Hour.**  
Administration and application of the OSHA Act in the construction industry; includes standards, the general duty clause, competent person, and hazard identification; fulfills the requirements for the ten-hour OSHA certifications.  
**Prerequisite:** Admission to upper level in Construction Science.
COSC 375 Estimating II  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Quantification and pricing of direct field costs and general condition costs  
from construction documents; the preparation of complete lump sum bid  
package ready for project execution; complete set of contract documents  
required.  
Prerequisites: Admission to upper level in Construction Science; COSC 275.  

COSC 381 Professional Ethics in the Construction Industry  
Credit 1. 1 Lecture Hour.  
Principles of ethical behavior in preparation for a professional internship  
with a construction or construction-related company; various construction  
company case studies emphasizing: personal accountability, integrity,  
moral courage, individual, association and company codes of conduct;  
accepted business practices, decision making, company cultures, peer  
pressure, public opinion.  
Prerequisite: Admission to upper level in Construction Science.  

COSC 421 Soil and Structural Analysis.  
Credits 3. 3 Lecture Hours.  
Advanced structural analysis of steel and concrete members with an  
introduction to soil properties and constituents; utilizations of computer  
analysis tools.  
Prerequisite: COSC 321.  

COSC 422 Structural Systems III  
Credits 3. 3 Lecture Hours.  
Structural principles applied to the design and construction of architectural  
reinforced concrete structures, reinforced masonry structures, and other  
selected topics.  
Prerequisite: COSC 421.  

COSC 440 Interdisciplinary Capstone  
Credits 4. 4 Lecture Hours.  
A senior capstone for students preparing to enter the designbuild sector  
of the construction industry; integration of the design and construction  
processes into a single, cohesive project delivery system, starting with  
project inception, and carrying through construction, operation and  
maintenance of various types of construction projects.  
Prerequisites: COSC 475; must be taken last full semester or summer  
before graduation.  

COSC 441 Residential Capstone  
Credits 4. 4 Lecture Hours.  
A senior capstone course for students preparing to enter the residential  
construction industry; project management of residential projects,  
including: market analysis, site analysis, residential design, building codes,  
estimating, scheduling, financing, subcontracting, marketing, business  
planning and current trends in design and construction.  
Prerequisites: COSC 475; must be taken last full semester or summer  
before graduation.  

COSC 442 Commercial Capstone  
Credits 4. 4 Lecture Hours.  
A senior capstone course for students preparing to enter the commercial  
construction sector; project management of commercial construction  
projects, including: aspects of design, bidding/estimating. Presentation,  
value engineering, contracts/negotiation, subcontractor relations,  
cost controls, management during construction, close out, and post-
construction requirements.  
Prerequisites: COSC 475; must be taken last full semester or summer  
before graduation.  

COSC 443 Industrial Capstone  
Credits 4. 4 Lecture Hours.  
A senior capstone course for students preparing to enter the industrial  
construction sector; project management of industrial construction  
projects including: project acquisition, planning and staffing, engineering,  
procurement, construction, start-up, close out, operations and  
maintenance, and turn-arounds.  
Prerequisites: COSC 475; must be taken last full semester or summer  
before graduation.  

COSC 446 Specialty Capstone  
Credits 4. 4 Lecture Hours.  
Senior capstone course for students preparing to enter the mechanical,  
electrical or other specialty construction company; project management  
of specialty contracts, including: project acquisition, schematic system  
design, estimating/bidding, scheduling, systems integration, value  
engineering, management during construction of crews and procurement,  
contract administration, business planning and current industry issues.  
Prerequisites: COSC 475; must be taken last full semester or summer  
before graduation.  

COSC 450 Facility Management Principles and Practices  
Credits 3. 3 Lecture Hours.  
Principles of facility management; the life cycle of a project; strategic  
planning; performance measurements; life cycle cost approach; building  
sustainability; maintenance management; and industry practices.  
Prerequisite: Admission to upper level in Construction Science.  

COSC 459 Industrial Construction  
Credits 3. 3 Lecture Hours.  
Industry specific knowledge such as concepts of developing construction  
management strategies of industrial projects, materials and methods,  
structural and mechanical components; preparation to effectively resolve  
challenges faced in the industrial construction sector.  
Prerequisites: Admission to upper level in construction science; COSC 375.  

COSC 461 Building Information Modeling System  
Credits 3. 3 Lecture Hours.  
Exploration of a data-rich, object-oriented, and parametric digital  
representation of the facility, from which views and information can be  
extracted and analyzed for construction project acquisition, planning, and  
control.  
Prerequisite: Admission to upper level in Construction Science.  

COSC 463 Introduction to Construction Law  
Credits 3. 3 Lecture Hours.  
Introduction to basic contract and tort issues and their application in  
the construction industry; delineation of the various types of contracts  
and remedies available to parties involved in a construction project;  
additional related topics including bidding, delays, mechanics liens, site  
conditions, warranties and the Uniform Commercial Code as it relates to  
the construction industry, introduction to legal research and reasoning as  
used by professional constructors.  
Prerequisite: Admission to upper level in Construction Science.  

COSC 464 Construction Safety II  
Credits 3. 3 Lecture Hours.  
Administration and application of the Occupational Safety and Health  
Administration Act in the construction industry; includes: OSHA standards,  
the general duty clause, competent person, and hazard identification;  
fulfills the requirements for the thirty-hour OSHA, CPR and First Aid  
certifications.  
Prerequisite: Admission to upper-level in Construction Science.
COSC 465 Advanced Topics in Construction Law  
Credits 3. 3 Lecture Hours.  
Legal issues affecting construction, including the parties to construction work, contracting, responsibilities and risk, risk management, damages, handling of claims and disputes, indemnification, bonds, insurance, bankruptcy, labor and employment, and subcontract management; litigation and alternative dispute resolution methods regularly used in the construction industry.  
Prerequisite: COSC 463.

COSC 468 Risk Management in the Built Environment  
Credits 3. 3 Lecture Hours.  
Decision-making and risk analysis concepts in the context of the built environment and construction projects; major categories and tools of risk management regularly used in the construction industry such as contracts, insurance and bonds.  
Prerequisites: Admission to upper level in construction science and COSC 463 or concurrent enrollment.

COSC 474 Facility Management Summer Internship  
Credits 3. 3 Lecture Hours.  
Summer internship (10 weeks, 400 hours) in a facility management related position that exposes the student to facility management activities; daily logs, monthly reports, final report and completion letter required; distance education off-campus course. May not be enrolled in any other TAMU course while enrolled in COSC 474.  
Prerequisites: COSC 450; approval of internship faculty coordinator.

COSC 475 Construction Project Planning  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Development of parameter cost estimates for activities that relate to the construction of a building project; work packages sequenced, planned and leveled to develop a working project execution document; development of procedures to monitor actual field progress.  
Prerequisite: COSC 353, COSC 375.

COSC 477 Construction Project Controls  
Credits 3. 3 Lecture Hours.  
Introduction to construction related financial documents including: schedule of values, labor and operations cost reports, income statements, balance sheets and construction budgets; emphasis on the development of techniques required to effectively monitor the financial aspects of a construction project.  
Prerequisite: COSC 353.

COSC 481 Seminar  
Credit 1. 1 Lecture Hour.  
Seminar discussion of construction equipment selection, utilization maintenance and operating cost.  
Prerequisite: Must be taken last full semester before graduation.

COSC 483 Construction Industry Contemporary Issues  
Credit 1. 1 Lecture Hour.  
Introduces graduating seniors to contemporary issues in the construction industry.  
Prerequisite: Must be taken last full semester before graduation.

COSC 484 Summer Internship  
Credits 3. 3 Other Hours.  
Summer internship (10 weeks, 400 hours) with a construction or construction-related company that exposes the student to construction-related activities; daily logs, monthly reports, final report and completion letter required; distance education course with non-resident status. No other TAMU courses may be taken while enrolled in COSC 484.  
Prerequisites: COSC 364 and COSC 381; approval of internship faculty coordinator.

COSC 485 Directed Studies  
Credits 1 to 5. 1 to 5 Other Hours.  
Special problems in building construction.  
Prerequisite: Admission to upper-level in Construction Science.

COSC 489 Special Topics in...  
Credits 1 to 4. 1 to 4 Lecture Hours.  
Selected topics in an identified field of construction science. May be repeated for credit.  
Prerequisite: Admission to upper-level in Construction Science.

COSC 491 Research  
Credits 1 to 4. 1 to 4 Other Hours.  
Research conducted under the direction of faculty member in construction science. May be repeated 2 times for credit. Registration in multiple sections of this course is possible within a given semester provided that the per semester credit hour limit is not exceeded.  
Prerequisites: Admission to upper level in Construction Science and approval of instructor.

COSC 494 Internship  
Credits 7. 7 Other Hours.  
An internship (15 weeks, 600 hours) with a construction or construction-related company that exposes the student to construction-related activities, daily logs, monthly reports, final report and completion letter required; distance education course with non-resident status. No other TAMU courses may be taken while enrolled in COSC 494.  
Prerequisites: COSC 364 and COSC 381; approval of internship faculty coordinator.