Undergraduate Construction Courses

CNST 1301. Introduction to Construction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
This course introduces the student to the characteristics of the construction industry; construction terminology; types of construction companies; parties involved in a project, their responsibilities, and relationships; evolution of a project; introduction to working drawings and construction documents; construction math; construction software.

CNST 1305. Construction Document Analysis. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course is an introductory college level class that will provide student with fundamental 2 & 3-dimensional drawings and contract specifications knowledge to technically interpret, extract, and communicate relevant information within the construction team. The course will utilize software tools appropriate for the course to guide and aid student understanding. Lab fee: $2.

CNST 1306. Construction Materials and Methods I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).
This course introduces students to the basic building materials and systems used in constructing buildings, bridges, and infrastructure projects. It offers the basic Understanding of the use of common systems such as foundations, structural framing/skeleton, building envelops, and finishes. Namely, it introduces students to proper terminology and usage of wood, steel, and concrete materials and selected manufactured components. Lab fee: $2.

CNST 1307. Construction Materials and Methods II. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course is an investigation into concrete and masonry construction methods, testing, and design used an residential and commercial construction is made. Topics include: concrete slab, wall, footing, and pier construction; brick and concrete masonry unit (CMU) wall construction; and decorative concrete /masonry design techniques. Lab fee: $2.

CNST 2301. Mechanical, Electrical & Plumbing Systems (MEP). 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course introduces students to the basic drawings, specifications, materials, installation procedures and commissioning methods common to mechanical, electrical and plumbing systems on residential and commercial construction projects.

CNST 2311. Construction Quality Assurance & Quality Control (QA/QC). 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course introduces students to the principles of construction quality assurance and quality control. This includes understanding the submittal, substitution and request for information (RFI) process found in typical commercial construction specifications. It will also discuss project closeout requirements including punch list management and warranty work. Field based quality control and testing will comprise the lab-based portion of the course.

CNST 2323. Construction Estimating. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).
This course introduces students to the skills and tools necessary to prepare formal cost estimations for residential construction projects. It focuses on pricing, indirect costs, bid analysis and use of computer aided software. The goal of this course is to expand the student's skills in new topics of estimating and to assist in developing high confidence in the application of construction estimating skills. This course addresses the typical procedures from familiarization with the CSI Divisions, building plans, material quantification, work breakdown, work quantification, pricing and bid submittals while creating detailed cost estimates. Prerequisite: CNST 1306, CNST 1307 Lab fee: $2.

CNST 3301. Building Mechanical and Electrical Systems. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).
This course introduces students to the planning and construction of mechanical and electrical systems common to construction projects. It involves basic calculations of cooling/heating loads, determination of temporary power demands, and sizing of pipes, HVAC equipment, and ducts. Lab fee: $2.

CNST 3302. Construction Cost Estimating and Analysis. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).
This course covers quantification and pricing of direct field costs and general condition costs for light commercial and industrial construction projects from contract documents as well as preparation of complete lump sum bid package ready for project execution with emphasis on the use of software in the estimating process. Prior knowledge or experience in construction, mechanical, and electrical systems is recommended. Prerequisite: CNST 2323, or CNST 3301 Lab fee: $2.

CNST 3308. Residential and Commercial Building Codes. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
Course introduces students to understand the basic principles of structural behavior emphasis on the the steel and wood members in residential and commercial building. This involves the application of the IRC (International Residential Code), IBC (International Building Code), AISC (American Institute of Steel Construction), and NDS (National Design Specification for Wood Construction). Lab fee: $2.

CNST 3309. Commercial Construction and Industrial Subsystems. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course introduces students to the terminology and functions of details of mechanical and electrical systems common to process and industrial plant projects. It involves basic calculations of systems, determination of power requirements, and selection of systems. Lab fee: $2.

CNST 3311. Construction Materials Testing and Inspection. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours). [WI (https://catalog.tarleton.edu/academicaffairs/)]
Construction materials testing and inspection procedures in laboratory and field situations using standard testing equipment, methods, and field inspection techniques per ASTM and ACI standards. Laboratory reports, computer analysis, data collection and simulated field inspections are included. Focus is placed on acceptance testing for construction materials. Prerequisites: CNST 1306 Lab fee: $2.

CNST 3320. Construction Safety Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
This course introduces students to OSHA regulations and industry practices related to creating and maintaining safe construction sites. Students will be eligible to sit for the 10-hour OSHA safety certification exam.

CNST 3321. Construction Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
This course provides an overview of construction operations and key management skills. This course is intended to emphasize field-based management while also providing an understanding of overall project management concepts including project delivery systems and project team organization. Field based construction practices include contractual documentation preparation, administration and record keeping, jobsite layout and control, facilitation of jobsite meetings, jobsite labor relations, personnel and site safety, subcontractor management, project quality control principles, sustainable practices at the jobsite, project changes and claims, schedule of values and progress payments and field-based project closeout.

CNST 3323. Construction Estimating I. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course introduces the student to the process of quantifying the materials, labor and equipment required to develop detailed cost estimates for construction projects of various size and scope. Course work is designed to develop the student’s ability to break down a project into individual work tasks, from the plans and specifications, which can then be quantified and priced. Topics addressed in this course include CSI divisions, plan and specification analysis, material and work break down for quantification and pricing, bid submittals, RFI’s, RFP’s, and RFQ’s. This course is CSI Master-Format driven and will be addressing the full scope of divisions throughout the semester. Lab fee: $2.

CNST 3325. Construction Specification Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course further expands on the students understanding of construction documents including specifications and drawings. The emphasis of the course is on the CSI (Construction Specification Institute) divisions . The course highlights technical aspects of these divisions of work including installation and commissioning. The course also describes the submittal and quality control processes associated with these specification sections. The lab component of this course will investigate the installation, quality and commissioning of these systems using models, videos or sample material. Lab fee: $2.

CNST 3335. Construction Layout and Site Development. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
Introduction to construction site surveying and layout including the ability to understand specifications and drawings typically found in civil drawing sets related to commercial construction or heavy/highway projects. Introduction to and utilization of surveying equipment and its application in construction layout and control including site layout, building layout and utility layout. Includes measurement and recording of distances, angles and elevations. Lab fee: $2.

CNST 3350. Horizontal Construction. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
Horizontal Construction will explore construction procedures and equipment options, capabilities, costs, and productivity involved with the construction of roads, bridges, infrastructure and utilities. General estimating and costing will be discussed, as well as characteristics, quality analysis, logistics and procedures required on horizontal construction sites. This course will be structured around CSI divisions as they relate to specific forms of horizontal construction processes.

CNST 3360. Vertical Construction. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
Vertical Construction will explore construction procedures and equipment options, capabilities, costs, and productivity involved with the construction of single-family homes, multifamily homes, commercial construction, industrial construction and hybrid construction. General estimating and costing will be discussed, as well as characteristics, quality analysis, logistics and procedures required on vertical construction sites. This course will be structured around CSI divisions as they relate to specific forms of vertical construction processes.

CNST 3385. Construction Project Scheduling. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course will provide student with an understanding of planning, scheduling, and monitoring construction projects, including development of schedules using critical path method, program evaluation and review techniques (PERT), Gantt charts, linear scheduling as well as resource allocation, cost control and software applications used to schedule construction projects. The student will learn these techniques using hard skills and software tools to accurately prepare, analyze, and communicate the schedule to all team members. Lab fee: $2.

CNST 4084. Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).
Topics will vary according to timeliness and special needs. May be taken more than once for credit.

CNST 4086. Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).
This course is designed to meet the needs of Engineering Technology students who have above average academic ability and who need to pursue subject matter that is not normally included in the Engineering Technology curriculum. Approval for enrollment in this course shall be with the concurrence of the individual instructor and the department head. The student must be currently enrolled in one of the majors offered in the Engineering Technology Department.

CNST 4310. Site & Building Foundations. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).
The course gives an overview of the difference and correlation between soil mechanics and foundations engineering. Soil mechanics is the branch of engineering that involves the study of the properties of soils and their behaviors under stress and strain in idealized conditions. Foundation engineering is the application of the principles of soil mechanics in the planning, design and construction of foundations for buildings, highways, dams and so forth. This course presents a detailed look into soil properties and foundations design. Prerequisites: PHYS 1401 or PHYS 2425. Lab fee: $2.

CNST 4313. Construction Law and Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
This course introduces students to basic understanding of contractual issues that are significant to construction managers. The course is designed to teach basic concepts of contract law and to recognize legal issues making decisions based on current industrial standards. The course also focuses on addressing ethics in the construction industry.

CNST 4322. Building Information Modeling. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course will provide student with skills and information needed to effectively utilize existing BIM technologies for planning and executing construction projects. This course will help students gain project-based knowledge on executing and managing concept using BIM and VDC (virtual design and construction) technologies for planning, monitoring, and controlling construction project from inception to operation and maintenance. Prerequisites: CNST 3321 Lab fee: $2.

CNST 4323. Construction Estimating II. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course applies and expands the student's ability to quantify materials, labor and equipment and develop pricing and estimates according to CSI division standards. Course work is structured to increase the level of complexity in detailed takeoffs, estimates, reporting and presentation. Topics addressed in this course include spreadsheet development, plan and specification analysis, material assembly development and detailed estimate (cost) reporting using computer software. This course is CSI Master-Format driven and will be addressing the full scope of divisions throughout the semester. Prerequisite: CNST 3323 Lab fee: $2.

CNST 4325. Contract Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
This course introduces students to issues regarding administering construction contracts. It focuses on understanding the purpose of contract documents, legal hierarchy of the documents, the interrelationships among the documents, common construction risks and liabilities and means and methods to mitigate such risks, along with the typical challenges related to communications among the parties involved. The course will primarily use the suite of American Institute of Architect (AIA) contract documents as a model contract. Prerequisites: CNST 3321.

CNST 4358. Construction Project Scheduling. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course will provide student with an understanding of planning, scheduling, and monitoring construction projects, including development of schedules using critical path method, program evaluation and review techniques, Gantt charts, linear scheduling as well as resource allocation, cost control and software applications to scheduling. The student will learn these techniques using hard skills and software tools to accurately prepare, analyze, and communicate the schedule to all team members.

CNST 4387. Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
An approved, supervised, comprehensive work experience consisting of a minimum of 320 hours (8 weeks) in a construction environment Prerequisite: at least 9 hours of CNST coursework.

CNST 4395. Construction Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Capstone projects will be administered in one of two formats. Students will either intern with a construction company and conclude their capstone project with a final presentation describing the learning outcomes from their internship or students will perform a desktop project where students will execute a project on paper which shall include a project bid, project schedule and a project plan. Alternatively, the student may be asked to develop research reports on current topical trends facing the construction industry. Prerequisite: Minimum of 90 hours of coursework complete.