CONSTRUCTION ENGINEERING (CONE)

Courses primarily for undergraduates:

CONE 1100: Leadership and Professionalism in Construction and Design
Credits: Required. Contact Hours: Lecture 1.
Orientation to the design and construction industry. Emphasis on teambuilding and professionalism, including teamwork, communication, career opportunities, leadership, and interacting with engineers in other disciplines. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring)

CONE 1210: Cornerstone Learning Community: Orientation to Academic Life
Credits: 1. Contact Hours: Laboratory 2.
Integration of first-year and transfer students into the engineering profession and the Construction Engineering program. Assignments and activities completed both individually and in learning teams involving teamwork, academic preparation, and study skills. Introduction to construction industry professionals. Teamwork topics include interdisciplinary teamwork, skills for academic success, diversity issues and leadership. Introduction to organization of program, department, college, and university. Overview of faculty, staff, policies, procedures and resources. (Typically Offered: Fall)

CONE 1220: Cornerstone Learning Community: Orientation to Professional Life
Credits: 1. Contact Hours: Laboratory 2.
Continuation of CONE 1210. Integration of first year and transfer students into the engineering profession. Career preparation, professional ethics, construction research, leadership. Introduction to construction industry professionals including how they interact with engineers in other disciplines. Continued introduction to program, department, college, and university organization. Overview of faculty, staff, policies, procedures and resources. (Typically Offered: Spring)

CONE 2220: Contractor Organization and Management of Construction
Credits: 3. Contact Hours: Lecture 2, Laboratory 2.
*Prereq: Credit or concurrent enrollment in (*CHEM 1670 *or* CHEM 1770*); Credit or concurrent enrollment in (*ABE 1600 *or* AERE 1600 *or* BME 1600 *or CE 1600 or* CHE 1600 *or* CPRE 1850 *or EE 1850 or* ENGR 1600 *or IE 1480 or ME 1600 or SE 1850); Credit or concurrent enrollment in* ENGL 1500*; Credit or concurrent enrollment in* ENGR 1010*; Credit or concurrent enrollment in* LIB 1600*; Credit or concurrent enrollment in* MATH 1650 *or MATH 1650H; Credit or concurrent enrollment* MATH 1660 *or* MATH 1660H*; Credit or concurrent enrollment* PHYS 2310 *or* PHYS 2310H*; Credit or concurrent enrollment in* PHYS 2310L
Entry level course for construction engineering: integration of significant engineering and management issues related to construction company operations. Company organization and operations; construction and project administration; construction contracts; project delivery systems; quality management; construction safety; contract and project documents. (Typically Offered: Fall, Spring)

CONE 2410: Construction Materials and Methods
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: engineering Basic courses
Introduction to materials and methods of building construction and to construction drawings. Foundation, structural framing, floor, roof, and wall systems. Blueprint reading and quantity takeoff techniques. (Typically Offered: Fall, Spring)

CONE 2510: Mechanical/Electrical Materials and Methods
Credits: 1. Contact Hours: Laboratory 3.
Prereq: Credit or enrollment in CONE 2410
Introduction to the materials and methods for mechanical and electrical construction systems and drawings. HVAC, water and waste water, power distribution, lighting, and fire protection. Blueprint reading and quantity takeoff. (Typically Offered: Fall, Spring)

CONE 3220: Construction Equipment and Heavy Construction Methods
Credits: 3. Contact Hours: Lecture 2, Laboratory 2.
Prereq: CONE 2220 *and* CONE 2410 *or CE 3060*
Selection and acquisition of construction equipment. Application of engineering fundamentals and economics to performance characteristics and production of equipment. Heavy construction methods and economic applications. (Typically Offered: Fall)

CONE 3400: Concrete and Steel Construction
Credits: 3. Contact Hours: Lecture 2, Laboratory 2.
Prereq: EM 3240 *and* CONE 2220 *or CE 3060*
Planning and field engineering for concrete and steel construction. Design and applications of concrete formwork to construction. Erection of structural steel. Emerging industry themes. (Typically Offered: Fall, Spring)

CONE 3520: Mechanical Systems in Buildings
Credits: 3. Contact Hours: Lecture 2, Laboratory 2.
*Prereq: (*CONE 2220*;* CONE 2510*;* PHYS 2320*;* PHYS 2320L*) or Permission of Department*
Comprehensive coverage of mechanical systems, plumbing, fire protection. Analysis techniques and design principles for each system. Required comprehensive design project for a major building project. (Typically Offered: Fall, Spring)

CONE 3530: Electrical Systems in Buildings
Credits: 3. Contact Hours: Lecture 2, Laboratory 2.
Prereq: ([Credit or concurrent enrollment in CONE 3520*];* PHYS 2320 *or* PHYS 2320H*;* PHYS 2320L*) or Permission of Department*
Comprehensive coverage of building electrical systems including power, lighting, fire alarm, security and communications. Analysis techniques and design principles for each system. Required comprehensive design project for a major building project. (Typically Offered: Fall, Spring)

CONE 3540: Building Energy Performance
Credits: 3. Contact Hours: Lecture 3.
Prereq: CONE 3520 *or Permission of Department*
Energy performance of buildings, building shells, HVAC, electrical and other building systems. Analysis and evaluation of building performance, energy efficiency, environmental quality, first costs, and operating costs. Strategies to exceed energy code requirements through the ASHRAE Standard 90.1. (Typically Offered: Fall)

CONE 3800: Engineering Law
Credits: 3. Contact Hours: Lecture 3.
Prereq: Junior classification
Introduction to law and judicial procedure as they relate to the practicing engineer. Contracts, professional liability, professional ethics, licensing, bidding procedures, intellectual property, products liability, risk analysis. Emphasis on development of critical thinking process, abstract problem analysis and evaluation. (Typically Offered: Fall)

CONE 3810A: Bidding Construction Projects I: Heavy and Highway
Credits: 1. Contact Hours: Lecture 1.
Prereq: Instructor Permission for Course
Team development of construction process designs and cost estimates for transportation construction projects under closely simulated conditions. Examine project sites, consult with construction industry mentors, obtain subcontractor and supplier quotations, and submit bids. (Typically Offered: Fall)

CONE 4220: Construction Cost Estimating and Cost Engineering
Credits: 3. Contact Hours: Lecture 2, Laboratory 2.
Prereq: CONE 2410 *and* CONE 2510
Conceptual and detailed cost estimating. Theory and practice of estimating construction costs of materials, labor, equipment, contingency, overhead and markup. Estimating competencies and bid ethics. Electronic quantity take off and pricing methods. Assemblies costs, unit costs, production rates. Analysis of project profitability, cost analysis and cost control methods. Value engineering. Life cycle cost analysis. (Typically Offered: Fall, Spring)

CONE 4410: Construction Planning, Scheduling, and Control
Credits: 3. Contact Hours: Lecture 2, Laboratory 2.
Prereq: Credit or enrollment in CONE 4220
Integration of previous construction coursework into the planning, scheduling, and management of time, costs, and other resources. Emphasis on preparation and analysis of network schedules. Comprehensive planning and scheduling project. Computer project management applications. (Typically Offered: Fall, Spring)

CONE 4810A: Bidding Construction Projects II: Heavy and Highway
Credits: 1. Contact Hours: Laboratory 2.
Prereq: Instructor Permission for Course
Similar to CONE 3810, except students with previous experience attempt projects with larger scope or lead students with less experience. (Typically Offered: Fall)

CONE 4870: Construction Engineering Design I
Credits: 3. Contact Hours: Lecture 2, Laboratory 2.
Prereq: CONE 3400*;* CONE 3520*;* CONE 3530*;* CONE 4220*;* CONE 4410*; Senior classification*
The integrated delivery of project services as a team, including preliminary engineering design process, constructability review, interaction with the client, identification of engineering problems, developments of a proposal, identification of design criteria, cost estimating, planning and scheduling, application of codes and standards, development of feasible alternatives, selection of best alternative, and delivery of oral presentations. (Typically Offered: Fall, Spring)

CONE 4880: Construction Engineering Design II
Credits: 3. Contact Hours: Lecture 1, Laboratory 5.
Prereq: CONE 3400*;* CONE 3520*;* CONE 3530*;* CONE 4220*;* CONE 4410*; within two semesters of graduation*
Application of team design concepts to a construction engineering project. Project planning. Advanced construction and project management. (Typically Offered: Fall, Spring)

CONE 4900: Independent Study

Credits: 1-3. Repeatable.

Prereq: Department Permission for Course

Individual study in any phase of construction engineering. Pre-enrollment contract required. (Typically Offered: Fall, Spring, Summer)