CONSTRUCTION SCIENCE AND MANAGEMENT (CSM)

CSM 1260. Introduction to the Construction and Concrete Industry.  
This is an introductory course for Construction and Concrete Industry Management (CIM) majors. Residential, commercial, heavy, civil and highway construction is explored including the concrete industry. The role of the contractor, architect/engineer and owner are covered including contracts, careers, sustainability and economic importance of the construction industry.  
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter

CSM 2160. Introduction to Construction Surveying and Site Layout.  
Common construction surveying and site layout techniques are studied using both optical levels and total stations. Benchmarks, building lines, property lines, differential and profiling are discussed in lecture with applied exercises performed in the laboratory.  
1 Credit Hour. 1 Lecture Contact Hour. 1 Lab Contact Hour.  
Course Attribute(s): Lab Required  
Grade Mode: Standard Letter

CSM 2313. Architecture Design I - Construction Documents.  
Students are introduced to the language and process of producing architectural construction documents in residential projects utilizing computers and CAD software. Site plans, floor plans, sections, elevations, and details are drawn individually and as a team as orthographic projection theory and its importance in resolving complex building geometry are covered.  
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.  
Course Attribute(s): Lab Required  
Grade Mode: Standard Letter

CSM 2342. Construction Materials and Processes.  
This course will introduce students to various types of construction materials including ceramics, ferrous, non-ferrous, and organic materials used in construction. Their properties, working characteristics and processes used to manufacture and assemble these materials are studied. Laboratory activities are used to reinforce lecture material. Prerequisites: PHYS 1315 and PHYS 1115 or PHYS 1410 or PHYS 1430, all with grades of "C" or better.  
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.  
Course Attribute(s): Lab Required  
Grade Mode: Standard Letter

CSM 3360. Structural Analysis.  
This is a structural engineering fundamentals class to include design loads, reactions, force systems, functions of a structure, and both the analysis and design of determinate structures by classical and modern techniques.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter

This is a commercial building construction systems class that deals with soils, site work, heavy foundations, steel, reinforced concrete and pre-cast structures along with common assemblies. Commercial MEP’s are studied along with CSI master format, as-built and shop drawings, schedule of values, AIA documents and appropriate building codes.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter

CSM 3363. Heavy, Civil and Highway Construction Systems.  
Selection, acquisition and capabilities of heavy construction equipment are presented. Applications of economics to performance characteristics and production of equipment is discussed. Sector-specific construction management methods are covered, including unit price estimating, equipment fleet design, repetitive scheduling and major components of highways, bridges and engineered facilities.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Lab Required  
Grade Mode: Standard Letter

Properties of subsurface materials and the principles of subsurface construction are studied. Topics include soil classification and testing, soil mechanics and foundation systems, including site layout, excavation, caissons, piles, slurry wall, slab and spread footings.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter

CSM 3367. Mechanical, Electrical and Plumbing Systems.  
This course covers typical Mechanical, Electrical and Plumbing (MEPs) systems found in residential and commercial construction along with design and installation methods used to conserve both energy and water in new and remodeled structures.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Lab Required  
Grade Mode: Standard Letter

Students create individual and group commercial projects which include plans, elevations, sections, details, and 3D drawings utilizing 3D building information modeling (BIM) and other current technologies used in the industry. Structural, mechanical, electrical, plumbing, accessibility, and sustainable building issues are discussed. Prerequisite: CSM 2313 with a grade of "C" or better.  
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.  
Course Attribute(s): Lab Required  
Grade Mode: Standard Letter
CSM 4360. Senior Construction Management Capstone.
Students work in groups, preparing a bid proposal based on a real life
crash project involving contract negotiations, construction
documents interpretation, estimating, bidding, scheduling, safety and
quality control plans. Emphasis is on developing leadership, team
building, written and oral communication skills. AIC Level 1 Examination
required for course completion. Prerequisites: TECH 2190 and CSM 4313
and CSM 4361 and CSM 4364 and CSM 4369, all with a grade of "C" or
better.
3 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

The fundamentals of construction estimating are covered including
feasibility, conceptual, square feet, cubic feet, unit in place, preliminary,
ingrafixing, range and contractor's detail bid estimates. Plans and
specifications are used along with contemporary estimating software
to develop estimates commonly used in the construction industry.
Prerequisite: CSM 3361 with a grade of "C" or better.
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

CSM 4364. Construction Project Management and Scheduling.
Concepts of construction management are studied beginning with
contract documents through the effective management of manpower,
machines, material and money necessary to complete construction
projects on time and within budget. Gantt Charts and PERT/CPM
schedules are developed, using contemporary software. Prerequisites:
CSM 4361, with a grade of "C" or higher. Corequisite: CSM 4361.
3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

This course covers environmentally sustainable practices used in
building design and construction. THE LEED system will be used to guide
the course, which covers aspects of sustainable sites, water efficiency,
energy and atmosphere, materials and resources, indoor environmental
quality and the CAD design process. (WI).
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Lab Required/Writing Intensive
Grade Mode: Standard Letter

CSM 4369. Construction Contracts, Liability and Ethics.
Legal aspects of design and construction contract documents are
presented, including contract formation, interpretation, rights and duties
and changes. Legal liabilities are explored in the context of professional
ethics for design firms and constructors. (WI).
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Writing Intensive
Grade Mode: Standard Letter

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
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
Grade Mode: Leveling/Assistantships

This course is a commercial building construction systems class dealing
with soils, site work, heavy foundations, steel, reinforced concrete, pre-
cast 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
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 consent of instructor.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Writing Intensive
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.
Prerequisites: CSM 5302 and CSM 5304 and CSM 5306, all with a grade
of "C" or better, or Instructor's Approval.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

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. Prerequisites: CSM 5302 and CSM 5304 and CSM 5306, all with
a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter