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

about Introduction to the Construction and Concrete Industry

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. Prerequisite: Pre-Construction or Instructor’s Approval.

1 Credit Hour. 1 Lecture Contact Hour. 1 Lab Contact Hour. Course Attribute(s): Lab Required Grade Mode: Standard Letter

about Introduction to Construction Surveying and Site Layout

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

about Architecture Design I - Construction Documents

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/PHYS 1115 or PHYS 1410 or PHYS 1430 with grades of "C" or higher.

3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour. Course Attribute(s): Lab Required Grade Mode: Standard Letter

about Construction Materials and Processes

CSM 2360. Residential Construction Systems. A residential construction course, which deals with interpreting plans and specifications, along with studying site work, foundations, walls, roofing, ceilings, floor and finishing systems. Also, residential MEP systems are covered along with applicable building codes and construction financing. Prerequisite: TECH 2342 or Instructor’s Approval.

3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours. Course Attribute(s): Lab Required Grade Mode: Standard Letter

about Residential Construction Systems

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. Prerequisites: Completion of Pre-Construction coursework and TECH 2351 with a grade of "C" or higher, or Instructor's Approval.

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

about Structural Analysis

CSM 3361. Commercial Building Construction Systems. 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. Prerequisite: Pre-Construction or Instructor’s Approval.

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

about Commercial Building Construction Systems

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. Prerequisite: Pre-Construction or Instructor’s Approval.

3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour. Course Attribute(s): Lab Required Grade Mode: Standard Letter

about Heavy, Civil and Highway Construction Systems

CSM 3366. Soils and Foundations. 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. Prerequisite: Pre-Construction and TECH 2351 with a grade of "C" or higher, or Instructor's Approval.

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

about Soils and Foundations
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. Prerequisites: Pre-Construction coursework or Instructor’s Approval.

about Mechanical, Electrical and Plumbing Systems
3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

about Mechanical, Electrical and Plumbing Systems

CSM 3313. Architectural Design II - Technology in Construction.
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. about Architectural Design II - Technology in Construction
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

about Architectural Design II - Technology in Construction

CSM 3360. Senior Construction Management Capstone.
Students work in groups to prepare a bid proposal based on a real life construction project involving contract negotiations, construction documents interpretation, estimating, bidding, scheduling and developing safety and quality control plans. Emphasis is on developing leadership, team building, and written and oral communication skills. For senior construction majors. Prerequisites: Pre-Construction coursework or MATH 2471 and TECH 4313, TECH 4361, TECH 4364, TECH 4369 or Instructor’s Approval. Recommended TECH 4390.

about Senior Construction Management Capstone
3 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

about Senior Construction Management Capstone

The fundamentals of construction estimating are covered including feasibility, conceptual, square feet, cubic feet, unit in place, preliminary, engineering, 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: Pre-Construction and CSM 3361 or Instructor’s Approval. about Construction Estimating
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

about Construction Estimating

CSM 3364. 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: Pre-Construction coursework and CSM 4361 (concurrent enrollment allowed) or Instructor’s Approval.

about Construction Project Management and Scheduling
3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

about Construction Project Management and Scheduling

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. Prerequisite: Pre-Construction or ID 2329 and CSM 2313 or Instructor’s Approval.

about Environmentally Conscious Design and Construction
3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour.
Course Attribute(s): Lab Required|Writing Intensive
Grade Mode: Standard Letter

about Environmentally Conscious Design and Construction

CSM 3369. 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. Prerequisite: Pre-Construction coursework or CIM 3340 or Instructor’s Approval. (WI).

about Construction Contracts, Liability and Ethics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Writing Intensive
Grade Mode: Standard Letter

about Construction Contracts, Liability and Ethics

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.

about Fundamentals of Construction Contracts and Liability Issues
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

about Fundamentals of Construction Contracts and Liability Issues

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.

about Fundamentals of Construction Estimating
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Grade Mode: Standard Letter

about Fundamentals of Construction Estimating
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. Does not count as degree credit.

**3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.**

**Course Attribute(s):** Leveling
**Grade Mode:** Leveling/Assistantships

about Fundamentals of Commercial Building Construction Systems

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 or consent of instructor.

**3 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.**

**Grade Mode:** Standard Letter

about Building Information Modeling

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, CSM 5304, and CSM 5306 or Instructor’s Approval.

**3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.**

**Grade Mode:** Standard Letter

about Construction Company Financial Control

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, CSM 5304, and CSM 5306.

**3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.**

**Grade Mode:** Standard Letter

about Construction Contract Delivery Systems