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 1115 and PHYS 1315] or PHYS 1410 or PHYS 1430 any 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 2360. Residential Construction I: Home Production. This course deals with the process of constructing a home on an improved lot, including residential plan and specification interpretation, cost centers, profit and overhead, construction phases, subcontractor sequencing, materials, estimating, scheduling, building codes, permits and Mechanical, Electrical and Plumbing home requirements.

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

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.

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

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.

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

CSM 3368. Construction Finance. This course provides an introduction to financial analysis and financing of construction-related companies and projects. Topics include analysis of financial statements, contractor payment methods, construction loans, and project cost controls. Prerequisite: MATH 2328 and [ACC 2301 or ACC 2362] and [CIM 3340 or CSM 4364] all with grades of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
This course will prepare students in the business practices used by residential land developers and home-builders. Technical skills are applied to the work process inside conventional home-building departments and how those collaborating departments and co-workers operate to become an efficient and sustainable new home-building company. Prerequisite: CSM 2360 with a grade of "D" or better.
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
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 construction 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: CSM 4313 and CSM 4361 and CSM 4364 and CSM 4369 and TECH 2190 all with grades 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, 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: 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. Corequisite: CSM 4361 with a grade of "C" or better.
3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour.
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

CSM 4370. Residential Capstone.
This is an advanced course in residential construction related to developing communities and building homes. Students work in groups to develop proposals to select and develop raw land into build-able lots, design and schedule site specific homes, and develop a marketing plan. AIC Level 1 Examination required. Prerequisite: CSM 3369 and CSM 4313 and CSM 4364 and CSM 4369 all with grades of "D" or better.
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Leveling
Grade Mode: Standard Letter

CSM 4380. Construction Safety.
This course covers construction and concrete industry safety-related topics, including state and federal construction safety laws, the application of the Occupational Safety and Health Administration (OSHA) and Mining Occupational Safety Administration (MOSA) requirements, and writing safety plans.
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|Leveling
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|Leveling
Grade Mode: Leveling/Assistantships
This course is a commercial building construction systems class dealing with soils, site work, heavy foundations, steel, reinforced concrete, precast 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|Leveling
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 instructor approval.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
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 grades of "C" or better or instructor 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 grades of "C" or better.

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