Course Descriptions

CIM 1010 - Introduction to the Concrete Industry 1 credit
Prerequisite: None

CIM1010 provides an overview of the history, career opportunities, job functions, and professional organizations in the concrete industry. Students will be introduced to the Concrete Industry Management curriculum, its instructional expectations and methodologies. Topics include: objectives of the Concrete Industry Management program, overview of the concrete industry, history of the concrete industry, overview of concrete, cement, aggregate and admixture properties and uses, concrete production and uses, concrete construction and contracting, professionalism and opportunities for CIM students and graduates as well as in the industry.

CIM 1050 Blueprint Reading 1 credit
Prerequisite: None

This course provides a broad-based background in interpreting blueprints. Typical plans for both residential and commercial building will be reviewed. Topics include: dimensioning, plot plans, foundation plans, elevations, floor plans, details; mechanical, electrical, civil, structural, and architectural plans specifications.

CIM 2050 Advanced Blueprint Reading 2 credits
Prerequisite: CIM 1050

This course is a required, hands-on combined lab/lecture course to reinforce the basic principles of blueprint reading and cover the interpretation of blueprints and specifications associated with the construction industry. Topics include line types, orthographic projections, dimensioning methods, and notes. Emphasis will be placed on interpretation of details for foundations, floor plans, elevations, and schedules. Upon completion, students should be able to interpret basic blueprints and visualize the features included as well as read and interpret a set of construction blueprints.

CIM 3000 Fundamentals of Concrete: Properties and Testing 4 credits (includes lab)
Prerequisite: CHEM 1010/1011 or CHEM 1110/1111 and CIM 1010

CIM3000 examines effects of concrete-making materials (aggregates, cements, admixtures, etc.) on the properties of fresh and hardened concrete. Concrete mixture proportioning calculations and statistical analysis of strength tests are also studied. Topics include: aggregate properties and testing (grading, specific gravity, absorption, moisture content, abrasion resistance, soundness, harmful substances); cement properties and testing (chemical composition, fineness, setting time, soundness, strength); supplementary cementing materials (fly ash, silica fume, blast-furnace slag); admixtures (air-entraining agents, water reducers, accelerators, retarders); fresh concrete properties and testing (workability, slump, air content, unit weight); hardened concrete properties and testing (strength, durability, volume changes, permeability); concrete mix proportioning (normal strength, high strength, and special mixes); statistical analysis of concrete strength tests. ACI Level I Field Testing Certification is required to pass the course.

CIM 3050 Concrete Construction Methods 3 credits
Prerequisite: CIM 3000

This course covers forming, shoring, placing and reinforcing operations. Transporting, placing, consolidating, finishing, jointing and curing concrete for cast-in-place foundations, pavements, slabs on ground, structural frames, and other structural members are studied. Other topics include waterproofing concrete foundations and erecting precast concrete members. Topics include: forming and shoring materials and methods, reinforcing materials and methods, transporting concrete (pumps, conveyors, crane and bucket), placing concrete (avoiding segregation), hot and cold weather concrete, consolidating concrete (vibrating screeds, immersion vibrators, external vibrators), finishing concrete (tools and methods), jointing (grooved, sawed, and formed joints – timing, spacing, and joint depth), curing methods, erecting precast and pre-stressed concrete members (crane operations, planning), waterproofing foundations (materials and methods). ACI Flatwork/Finisher Certification is required to pass the course.
CIM 3060 Understanding the Concrete Construction System  
**Prerequisites:** CIM 3000  
3 credits

CIM3060 takes a detailed look at how the concrete construction industry works. The course includes a review of model building codes, building officials and their function, concrete industry codes and standards, concrete construction processes, quality assurance systems, contract documents, estimating, construction scheduling and concrete construction markets. Topics include: model building codes, concrete industry codes and standards, concrete quality assurance systems (project), job specifications, the bidding process, contracts, bonds, insurance, construction scheduling, concrete construction estimating, construction safety.

CIM 3070 Site Planning, Layout, and Preparation  
**Prerequisite:** CIM 1010 and General Education Math Requirement  
3 credits

CIM3070 involves the various activities required to successfully prepare a site for concrete work. These include initial site investigation, surveying, groundwork, subbase preparation, and elevations. In addition, students will be exposed to modern technological tools and methods, such as the use of GPS, EDM, and lasers. Topics include: initial site investigation, land surveying methods, excavation and backfill, subgrade preparation, elevations, form choice and setup, squareness of forms, location of embedments, field practice using tools and techniques discussed.

CIM 3080 Formwork Design and Computerized Drafting  
**Prerequisite:** CIM 3050  
3 credits

CIM3080 provides foundational understanding of economics and safety with regard to formwork selection, design, and construction. In addition, students will review the various forming systems available and how they may be integrated for use in specific project circumstances. This course will include a basic review of CAD drafting techniques and their application. Topics include: labor and materials in formwork economics, safety in formwork design and construction, commercially available forming systems, formwork design and integration, introduction to CAD, application of CAD in formwork design and construction layout.

CIM 3100 Applications of Concrete in Construction  
**Prerequisite:** CIM 3050  
3 credits

CIM3100 is a detailed study of the many uses of concrete in the construction of buildings, pavements and other facilities. Emphasis will be placed on the advantages, disadvantages, and unique problems faced by materials suppliers, contractors and design professionals when concrete is chosen for specific applications. Topics include: pavements (construction methods, repair, rehabilitation, life-cycle costing), residential construction (decorative flatwork, basements, foundations, block, ICF’s), commercial construction (block, cast-in-place, pre-cast, pre-stressed, and architectural concrete), underground systems (septic, pipe, culverts, etc.), concrete estimating methods and software (project), concrete repair methods and materials, special topics (mass work, underwater placements, etc.)

CIM 3200 Concrete Project Estimating  
**Prerequisite:** CIM 2050 and General Education Math Requirement  
3 credits

CIM3200 involves using project drawings to prepare both basic and detailed estimates. Activities include practice implementing the print reading, estimating and other skills acquired using actual sets of finished drawings. Projects will become more complicated as the semester progresses, and will include below-grade, flatwork, and above-grade examples. Topics include: blueprint reading, project general conditions and specifications, quantity take-offs, estimating and bidding, foundations and basements, parking lots and roadways, flat slab and tilt-up, above grade floors and walls, and unique projects (dams, tunnels, skyscrapers, parking garages, etc.)

CIM 3300 Concrete Industry Internship  
**Prerequisites:** CIM 3000  
2 credits

CIM3300 provides an opportunity for students to gain supervised, practical work experience in their particular field of interest within the concrete industry. The student will be evaluated by his/her supervisor, and a final report will be submitted by the student detailing the internship experience. Possible experiences may include: concrete production management in ready mix, block, pipe, or precast/prestressed facilities, a sales internship for a concrete company or concrete materials or equipment supplier, construction management internship for a specialty concrete or general contractor, or other opportunities at the discretion of the supervising faculty and program director.
CIM 4010 Design and Construction Issues  3 credits
Prerequisite: CIM 3200

CIM4010 involves a review of concrete construction materials and their physical and mechanical properties. Special emphasis will be placed on the concepts of mechanics of materials and resolving design/construction mismatches. Topics include: review of concrete properties, admixture effects, and mix designs; reinforcement type and placement; properties of materials; statics principles; deflection and loading; stress and strain; subgrade and base materials; and modern trends.

CIM 4030 - Issues in the Concrete and Construction Industry: A Legal and Ethical Perspective  1 credit
Prerequisite: CIM 3100

This course involves a case study approach to critically analyzing historical and current events in the concrete and construction industry. Particular emphasis is placed on developing a managerial decision-making process incorporating ethical, legal, financial, and other business perspectives.

CIM 4050 - Management of Concrete Products: Ordering and Delivering  3 credits
Prerequisite: CIM 3100

This course provides students with basic understanding on managing order and delivery processes common to all concrete products. Emphasis is placed on planning, organizing, and controlling at both the first-line supervisory and managerial levels. Key differences in the order and delivery functions of ready mix concrete, concrete masonry, pre-cast concrete, pre-stress concrete, and concrete pipe supplemented by product-specific guest lectures and plant tours.

CIM 4060 - Management of Concrete Products: Production Facilities  3 credits
Prerequisites: CIM 4050

This course provides students with basic understanding of managing the manufacturing process common to all concrete products production facilities. Emphasis is placed on planning, organizing, and controlling at both the first-line supervisory and managerial levels. Review of key differences in manufacturing process of ready mix concrete, concrete masonry, precast concrete, pre-stress concrete, and concrete pipe explained through product-specific guest lectures and plant tours.

CIM 4070 - Concrete Contracting Personnel Management  3 credits
Prerequisites: CIM declared major and senior standing

This course teaches applications of personnel management techniques in the contracting business. Emphasis on adapting management styles to various employee personality traits, training techniques, personal management, effective and efficient management of equipment and other resources, and leadership development.

CIM 4100 - Field Management and Supervision  3 credits
Prerequisite: Senior standing

This course offers knowledge and skills to effectively manage concrete construction jobsite activities. Emphasis on safety, equipment identification and use, maintenance, contingency plans, and worksite productivity.

CIM 4150 - Concrete Problems: Diagnosis, Prevention, and Dispute Resolution  3 credits
Prerequisite: CIM 3100

This course teaches students how to diagnose and prevent problems related to concrete production, testing, construction, and performance. Students identify causes of fresh and hardened concrete problems such as fast and slow setting, air content variations, low strength, cracking, and scaling. Pre-job conferences and dispute resolution methods are emphasized.

CIM 4200 - Senior Concrete Lab  2 credits
Prerequisite: CIM 3000 and senior standing

This course provides an opportunity for students to gain in-depth knowledge of the technical aspects of concrete and cement chemistry in a laboratory environment. The student will be evaluated by his/her ability to investigate a concrete situation and resolve the issue with a laboratory project. Graded activities include in-class exercises, written reports, and oral presentations. One hour lecture and three hours laboratory
CIM 4300 – Concrete Mixture Design
Prerequisite – CIM 3100
3 hours
A detailed study on the standard practices of designing and proportioning various types of concrete mixtures. The course will also address the basic principles that govern the use of different types of cements, aggregates, supplementary cementitious materials, and chemical admixtures in concrete mixture design.

CIM 4400 – Decorative Concrete
Prerequisite – CIM 3000
3 hours
Understanding and utilizing decorative concrete design applications, production, stamping, staining, and sealing. Manufacturing of concrete countertops, as well as vertical, flooring, and ornamental applications.

CIM 4500 – Masonry
Prerequisite – CIM 3000
3 hours
Use, types, and manufacture of concrete masonry units. Discussion of common techniques and technical considerations relating to construction using concrete masonry. Review of typical laboratory testing procedures used to very specification compliance of concrete masonry units for use in construction.

CIM 4600 – Design, Manufacture, and Installation of Precast Concrete
Prerequisite – CIM 3050
3 hours
This course is designed to provide the student with a thorough knowledge of the precast concrete industry. The course covers all relevant topics within the precast concrete industry including design, manufacture, handling, transportation, safety, quality, and erection of precast concrete products. Upon completion of this course, the student will have acquired sufficient knowledge to minimize the learning curve as a new professional in the precast industry.

CIM 4800 - Special Problems in Concrete Industry Management
Prerequisite: none
1 to 3 credits
Opportunity to pursue projects of individual interest in concrete industry management. Projects may be technical and/or managerial in nature and may require any combination of literature reviews, lab work, field studies, and other research methods. A faculty member will approve a formally submitted proposal for the study, supervise progress, and grade a report and a presentation which are required upon completion of the project. May be repeated for up to 6 hours of undergraduate credit.

CIM 4910 – Capstone
Prerequisite: CIM 3300 and senior standing
3 credits
Intensive study of a problem(s) appropriate to the major and the student’s career interest. Solution(s) for problem(s) presented to a committee of concrete industry representatives. Presentation must emphasize depth of analysis, completeness and effectiveness of solution, and presentation skills.