

CONSTRUCTION (CON)

CON 100 - Introduction to Construction (1.0 hour)

Introduction to the construction profession. Computer applications, problem solving concepts, design concepts and visualization, industry ethics, professional societies, and university services.

CON 114 - Ethics in Construction (1.0 hour)

Ethical and professional issues in the construction industry including an overview of applicable codes of ethical behavior and principles of professional conduct; introduction to ethical decision making; understanding of professional development opportunities; legal versus ethical responsibilities; written and oral communication practices and case studies.

CON 132 - Construction Graphics (2.0 hours)

Symbols, conventions, details of construction drawings, and blueprint reading. Emphasis on interpretation and communication of requirements of contract drawings.

CON 200 - Construction Co-op (0.0 hours)

Core Curriculum: EL

Full-time cooperative education assignment for construction students who alternate periods of full-time school with periods of full-time academic or career-related work in industry. Satisfactory/Unsatisfactory. Prerequisite: Sophomore standing in the College of Engineering and Technology, 2.0 overall grade point average at Bradley, approval of engineering and technology Co-op coordinator and Co-op faculty advisor.

CON 206 - Surveying (3.0 hours)

Theory and applications of measurements of horizontal distances, differences in elevations, horizontal angles, vertical angles, bearings, azimuths, and areas and volumes. Simple horizontal and vertical curves, topographic surveys and mapping. Basic surveying techniques for construction layout and control. Public land surveying systems. Emerging surveying and mapping technology.

CON 224 - CADD in Construction (3.0 hours)

Introduction to commonly used computer based drafting and visualization programs with applications in construction; CAD standards; introduction to Building Information Modeling (BIM) and project collaboration techniques.

Prerequisite: CON 132

CON 262 - Mechanical and Electrical Systems I (3.0 hours)

Survey of basic principles, methods, and equipment for building component systems related to human health and comfort. Introduces heating/cooling systems, electrical systems, plumbing, and lighting systems.

Prerequisite: CON 132.

CON 270 - Construction Materials and Methods I (3.0 hours)

Characteristics and use of basic construction materials including concrete, metals, wood, masonry, and asphalt. Introduction to materials specifications, excavation, foundation systems, roofing, exterior and interior framing, doors and windows, glass and glazing, and finishes.

CON 272 - Construction Materials and Methods II (3.0 hours)

Applications of materials and construction techniques used in structural systems of wood, steel, concrete, and masonry. Placement of foundations, asphalt, cladding systems, and interior construction methods.

Prerequisite: CON 270

CON 314 - Principles of Construction Project Management (3.0 hours)

Principles of Construction Management for non-construction or civil engineering majors. Basic concepts of ethics in construction.

Introduction to estimating and scheduling.

Prerequisite: CON 132, CON 270

CON 320 - Soil Mechanics (3.0 hours)

Introduction to soil mechanics and foundation construction. Soil index properties, classification, stress analysis, soil compaction, settlement, seepage, dewatering, excavations, and foundation construction.

Prerequisite: IMT 222 or C E 150

CON 326 - Construction Estimating (3.0 hours)

Feasibility estimates, design estimates, quantity takeoff, direct and overhead costing, and cost control. Material, equipment, and labor estimates of construction projects, bidding strategy, and basic concepts in management and business. Includes laboratory.

Prerequisite: CON 132

CON 330 - Housing (3.0 hours)

Planning residential areas: geographic location, orientation, functions, and interrelationships of functions. Fundamentals of residential design which can result in quality living environments for all income levels.

Prerequisite: CON 132.

CON 342 - Construction Equipment (3.0 hours)

Characteristics of construction equipment; includes types, methods for their efficient use, and production calculations. Risk and cost analysis.

CON 352 - Sustainable Urban Environment (3.0 hours)

Principles of land utilization, feasibility, subdivision planning, and other elements related to planning and developing sustainable urban environments.

Prerequisite: CON 132.

CON 356 - Construction Safety (3.0 hours)

Introduction to OSHA Construction Safety Standards. Design of a safety program, risk analysis of a company's home office and field safety performance characteristics, potential problems, contingency planning, and safety audit analysis.

Prerequisite: CON 262; CON 270.

CON 368 - Mechanical and Electrical Systems II (3.0 hours)

Survey of large scale integrated building component systems related to human health and comfort. Topics include lighting, electrical design and layout, vertical transportation, alarm and security systems, fire protection, total space conditioning, water treatment and sewage treatment, industrial piping design.

Prerequisite: CON 262.

CON 372 - Construction Methods Improvements (3.0 hours)

Principles and methods for productivity improvement; uses and limitations; personnel management; labor productivity and productivity modeling.

Prerequisite: CON 270.

CON 388 - Contract Administration (3.0 hours)

Introduction to construction law, bonding, insurance, DBE requirements, risk analysis and management. Types of contracts and contract content to include specifications, general conditions, and bidding requirements. Introduction to AGC, AIA and EJCDC construction contract documents. Regulations and types of potential claims and change orders and dispute resolution. Reasons and costs of change orders and claims. Global and emerging contractual and procedural issues. Dispute resolution. Case studies.

CON 392 - Construction Scheduling (3.0 hours)

Economic considerations and tools of management: cost reporting; scheduling. Emphasis on network methods of scheduling: resource allocation and least-cost expediting. Introduction to computerized scheduling with emphasis on Primavera and MS Project.
Prerequisite: CON 326.

CON 394 - Construction Labor and Unions (3.0 hours)

Union and non-union activities in construction industry: history, analysis, organizing, bargaining, contract language, jurisdictional disputes, training, and restrictions on operating non-union.

CON 430 - Commercial Construction (3.0 hours)

Principles and practices of commercial construction. Traditional and green building practices, and methods for selection and installation of material assemblies used in commercial construction.
Prerequisite: CON 270

CON 435 - Heavy and Highway Construction (3.0 hours)

Contractual obligations and funding of horizontal construction. Emphasis on estimating, environmental compliance analysis, excavation and earthwork operations, and safety of horizontal construction operations.

CON 452 - Green Construction and LEED (3.0 hours)

Green design, construction, and operations from a project management standpoint. Introduction to the design and construction of high performance green buildings. Building-Community Interaction. Economical and ecological benefits of green buildings. Preparation for the LEED GA Exam.
Prerequisite: CON 270

CON 470 - Design of Steel and Wood Structures (3.0 hours)

Overview of the basic principles of structural behavior and introduction to the analysis and design of steel and wood structural members. Formwork design and applications in other construction related problems.
Prerequisite: C E 270 or IMT 324

CON 471 - Concrete and Masonry Construction (3.0 hours)

Overview of materials used in concrete and masonry construction. Introduction to reinforced concrete design and basic concepts in concrete and masonry construction. Laboratory Experiments.
Prerequisite: C E 270 or IMT 324

CON 481 - Projects I (1.0-3.0 hours)

Supervised individual study of construction projects.
Prerequisite: Consent of Advisor.

CON 490 - Special Topics I (1.0-3.0 hours)

Topics of special interest which may vary each time course is offered. Topics are stated in the current Schedule of Classes.
Prerequisite: consent of advisor.

CON 491 - Special Topics II (1.0-3.0 hours)

Topics of special interest which may vary each time course is offered. Topics are stated in the current Schedule of Classes.
Prerequisite: consent of advisor.

CON 492 - Construction Project Controls (3.0 hours)

Use of project control processes for construction management to include risk management, cost, scheduling, and quality assurance and control. Practical application of financial and accounting fundamentals specific to the construction industry.
Prerequisite: CON 392

CON 493 - Senior Project Planning (2.0 hours)

Core Curriculum: WI,EL

First of a two-semester course project sequence. Discussions of the relationship between the owner, architect, consultant, superintendent, construction manager, general contractor, and subcontractors. Methods of project delivery, project concept through construction, design phases and project challenges. Leadership, ethics, public policy issues, LEED, and basic business management practices. Software applications in construction. Oral and written report of preliminary plan.
Prerequisite: CON 388 and consent of advisor.

CON 494 - Construction Practice (3.0 hours)

Business ethics in construction; responsibilities and professionalism; construction business practices.
Prerequisite: CON 388.

CON 498 - Senior Project (3.0 hours)

Core Curriculum: WI,EL

Application of construction principles to actual industry projects. Detailed estimate of the project, bidding strategies, site layout/development plan for construction staging, preparation of sample contracts using AIA and AGC formats, construction scheduling, project closeout plan, jobsite safety plan, and strategies to achieve LEED rating points.
Prerequisite: CON 493

CON 520 - Advanced Construction Practice (3.0 hours)

Issues of the processes affiliated with the construction and engineering consulting profession: project delivery, conception through construction of projects, phases of design, and unique challenges. Case studies will be utilized.
Prerequisite: CON 494, or graduate standing.

CON 522 - Advanced CADD (3.0 hours)

Applications of CAD systems. Visualization and optimization of the processes used in construction through three-dimensional modeling and utilization in various civil engineering and construction applications.
Prerequisite: CON 224 or C E 224, or graduate standing.

CON 524 - Building Information Modeling (3.0 hours)

Application of state-of-the-art technology in projects during various phases from inception to completion including planning, design, procurement, construction, handing over, and operation and maintenance. Investigation of different available tools and technologies in recording, storing, and sharing project information.
Prerequisite: CON 224 or C E 224, or graduate standing.

CON 526 - Advanced Construction Estimating (3.0 hours)

Advanced techniques in taking-off quantities, pricing techniques, computer estimating, and bidding strategy models.
Prerequisite: CON 326, or graduate standing.

CON 528 - Advanced Construction Scheduling (3.0 hours)

Project scheduling methods with emphasis on network scheduling techniques, work breakdown structure (WBS), resource and cost loading, scheduling under uncertainties, project time compression, resource leveling, scheduling for linear projects (LOB), time-cost trade-offs, project status, reporting and updating, schedules as tools for claims documentation. Case studies. Computer based.
Prerequisite: CON 392, or graduate standing.

CON 529 - Advanced Construction Contracts (3.0 hours)

Issues in the administration and implementation of a construction contract. Coordinating and controlling the construction project under legal and ethical considerations.
Prerequisite: CON 388, or graduate standing.

CON 536 - TQM Principles (3.0 hours)

Theory and analysis of the Total Quality Management system as applied within the construction industry. Case studies.

Prerequisite: Q M 262 or equivalent, or graduate standing.

CON 537 - Construction Simulation (3.0 hours)

Decision making using simulation and simulation languages to model construction operations. Simulation of construction process using what-if analysis. Role of simulation and decision making in the planning and scheduling phases in the construction industry. Topics include introduction to discrete event simulation, generation of random numbers, queuing, simulation languages for construction.

Prerequisite: Q M 262 or equivalent, or graduate standing.

CON 540 - Project and Company Management (3.0 hours)

Unique issues of company and project management in the construction industry not traditionally found in construction programs, such as fraud, regulatory issues, and international construction. Presentations on project and company management by renowned experts will give the student knowledge and insights on new trends, innovative procedures, practical case studies, and exposure to innovation in construction.

The course will give the student knowledge of the business aspects of running a wide range of construction companies and a variety of projects.

Prerequisite: CON 326 and CON 392, or graduate standing.

CON 591 - Advanced Topics I (1.0-3.0 hours)

Topics of special interest, which may vary each time course is offered.

Topic stated in current Schedule of Classes.

Prerequisite: Consent of department chair.

CON 592 - Advanced Topics II (1.0-3.0 hours)

Topics of special interest, which may vary each time course is offered.

Topic stated in current Schedule of Classes

Prerequisite: Consent of department chair.

CON 593 - Advanced Project I (1.0-3.0 hours)

Supervised individual study of construction projects.

Prerequisite: Consent of department chair.

CON 594 - Advanced Project II (1.0-3.0 hours)

Supervised individual study of construction projects.

Prerequisite: Consent of department chair.