

## **Construction Management (CMGT)**

### **CMGT 4120 Construction Planning & Scheduling (4 Credits)**

Understanding and applying scheduling and control to construction projects is essential to successful construction management. Project scheduling emphasizes network-based schedules, such as critical path management (CPM), network calculations, critical paths, resource scheduling, probabilistic scheduling and computer applications. Project control focuses on goals, flow of information, time and cost control, and change management. Prerequisite or Corequisite: CMGT 4420.

### **CMGT 4155 Sustainable Development (4 Credits)**

The course includes many case studies of historic and contemporary structures exemplifying various sustainability features. Emphasis is placed on how LEED project certification influences the overall construction project. Topics include LEED certification techniques for sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, innovation and design. The following topics are covered from a LEED perspective: ventilation, air conditioning, heating, electrical lighting, energy efficiency, and building control systems. The student studies and analyzes how management and LEED techniques are applied to current construction projects.

### **CMGT 4177 Environmental Systems and MEP Coordination (4 Credits)**

A study of electrical and mechanical systems used in the construction of buildings. Course content includes system design, component selection and utilization for energy conservation, cost estimating or systems, coordination and management of installation. Specific systems included are electrical, air conditioning, heating, ventilation and plumbing, fire protection, life safety, communication, power systems and lighting. The course also considers coordination of MEP systems and explores emerging technology and environmental issues related to mechanical and electrical systems in buildings.

### **CMGT 4230 Design Management and Schedule Control (4 Credits)**

This course examines the various strategies and techniques associated with managing the design delivery process to align with the construction budget and schedule needs in an integrated fashion. Design planning, scheduling, and resource allocation are considered along with design value determination and management of the design-construct interfaces.

### **CMGT 4250 Construction Job Site Management (4 Credits)**

This course addresses how a successful construction project is managed and administered from design through construction to closeout. Emphasis will focus on how to unite the key stakeholders (contractors, architects, engineers, etc.) to provide them with a workable system for operating as an effective project team. The latest technology, laws and regulations associated with contract administration will be presented. Topics pertinent to each stage of a project are introduced and discussed as they occur throughout the life of the project. Numerous real-world examples will be utilized throughout the course. Various electronic project administration tools and techniques will be demonstrated including Building Information Modeling.

### **CMGT 4320 Introduction to Architecture and Design Management (4 Credits)**

This course introduces students to the significant value that architecture brings to real estate and the built

environment and the various services and professions associated with it. Students will be introduced to principles, protocols and the planning process related to the design function and the link between the architect's vision and the finished physical structure. Students will be introduced to design, thinking, theory and application. Student will learn to read and interpret the various graphical and written construction documents as well as know how they are developed and what information they contain. Architectural, structural, mechanical, electrical, plumbing and civil drawings and specifications are covered. The business model for design services will be explored as well as the unique risks and challenges associated with managing the design throughout the various stages of development and construction.

**CMGT 4410 Construction Building Systems (4 Credits)**

A survey of residential and commercial construction materials, means, and methods associated with the various structural and architectural systems used to design and construct buildings. Project plans and specifications are incorporated to teach the basic sequencing and overall construction process. The influence of sustainability in construction is introduced. This class will also have an off campus, experiential learning lab associated with it.

**CMGT 4420 Construction Estimating (4 Credits)**

This course is designed to provide the student with the theory, principles and techniques of quantity analysis (take-off), labor determinations, overhead and profit analysis. It offers insight into the construction estimating process. The role of the estimator, types of estimating, CSI divisions, bid/contract documents, change order pricing, design/build projects and estimation compilation will be introduced. Discussions regarding the cost/benefit of sustainable materials and typical construction materials will enhance the requisite knowledge of construction estimating. Experiential learning lab is associated with this course. Prerequisite: CMGT 4320 and CMGT 4410. This course is a co/prerequisite for CMGT 4120.

**CMGT 4480 Const Project Management (4 Credits)**

Principles and techniques of construction project management, use of systems analysis, internal and external procedures, planning, programming, budgeting and staffing, controlling major projects, emphasis on construction scheduling techniques with case application.

**CMGT 4490 Residential Development (4 Credits)**

A course sequence designed to emphasize the practical application of the theories and concepts of residential development. The course provides a capstone experience for seniors. Students are expected to apply their knowledge of general business, real estate and construction management practices by forming a student business entity, acquiring land, building and selling a residential property in a case format. Students will apply accounting, finance, marketing, real estate and construction management techniques in the planning for a residential development. The application of green building materials and methods is emphasized.

**CMGT 4700 Topics in Construction Mgmt (0-4 Credits)**

**CMGT 4980 Construction Mgmt Internship (0-4 Credits)**

Daniels College of Business's graduate curriculum is designed to be experiential and build upon practical experience. To gain the full benefit of this curriculum, students are encouraged to expand their experiential learning beyond the short term experiences required in the classroom. Internships that allow students to

apply newly learned skills and theories in the workplace are considered an integral to the curriculum and all students are strongly encouraged to seek such opportunities.

## **Real Estate (REAL)**

### **REAL 4000 Fundamentals of Real Estate and the Built Environment (4 Credits)**

An exploration of the importance of real estate and the built environment through triple bottom line analysis of its social, environmental, and economic impacts. The course considers a "cradle to cradle" sustainability model that links the various phases, functions, and professions of real estate, project delivery, and asset/facility management to create holistic, value-generating solutions for society. Professional practices/skill sets associated with the many career options that engage the built environment are demonstrated. Principles of real estate, real estate industry and its markets; legal aspects of home ownership from consumer's point of view, including property rights, title concepts, deeds, purchase contracts, listing contracts, law of agency, environmental issues and disclosures, types of mortgages, basics of home loan finance, appraisal investment and tax benefits will also be covered. Partially satisfies Colorado real estate broker licensing requirements.

### **REAL 4007 Real Estate Financial Analysis (4 Credits)**

Alternative analysis formats that can be applied to a wide array of real estate analysis issues; simulates working/decision-making environment; structured overview of analysis tools focused on specific facets of multidimensional real estate decision-making environment; applications in investment analysis, feasibility analysis, valuation, market analysis, and report writing and presentation. Prerequisite: REAL 4407.

### **REAL 4010 Real Estate Capital Markets (4 Credits)**

This course exposes students to the commercial real estate capital markets; including real estate investment trusts (REITs) and commercial mortgage-backed securities (CMBS), plus institutional investors. The complexities of capital market products are discussed, students receive a greater understanding of the alternatives that are available. The class includes lectures, guest speakers, readings, class discussions, a major REIT analysis project, and case studies. Cross listed with REAL 3010. Prerequisite: REAL 4007.

### **REAL 4140 International Immersion in Real Estate and the Built Environment (4 Credits)**

This course focuses on inbound U.S. and outbound U.S. real estate issues, with a mix of cultural issues that impact real estate transactions. Application of sustainability concepts is important in this course dealing with international real estate issues.

### **REAL 4210 Planning, Entitlements, and Public Finance (4 Credits)**

Real estate development, place making, and community building require the combined efforts of the public, for-profit, and non-profit sectors. Participants in the real estate development process need to understand and appreciate the sometimes competing and sometimes collaborative interests of governments, agencies, and the private developer. This course is designed to familiarize students with the overall context of urban planning and land use. Students discover the variety of participants in the development process and also become familiar with the project entitlement process, zoning, and land use regulation. Students also examine public/private financing structures such as public-private-partnerships (P3s) and become familiar with detailed calculations relating to Tax Incremental Financing (TIF) and

Metropolitan Districts.

**REAL 4337 RE Securities/Syndications/Entrepreneurship (4 Credits)**

Introduction to real estate securities; emphasis on private offerings; determining whether a contemplated transaction involves a security, and what happens if it does; exemptions from registration (Reg D); registration requirements; investor suitability, how to syndicate, acquisition of property, marketing of the property, tax structure and formation of syndication, compensation to syndicators, real estate tax considerations.

**REAL 4347 Property and Asset Management (4 Credits)**

Explore the complexities of managing apartments, condominiums, office buildings, industrial property and shopping centers. This course covers rental markets, development of rental schedules, leasing techniques and negotiations, repairs and maintenance, tenant relations, merchandising, selection and training of personnel, accounting, and owner relations.

**REAL 4357 Corporate Real Estate & Management (4 Credits)**

This course provides a snapshot view of the corporate real estate life cycle and how to strategically plan and manage it. Over the ten week period we will address the diverse but critical components that together account for Facility Management. These shall include: Building Life Cycles and sustainability, facility management as part of the enterprise model within a corporate structure, regulatory agencies, professional relationships and the impact of the build environment on the bottom line, contracting and budget management, move-add-change (MAC) / operations, and general administrative services.

**REAL 4369 Real Estate Taxation (4 Credits)**

Tax factors affecting investments and operations in real estate; special attention is given to legal forms of ownership, depreciation, tax basis, tax impacts of exchanges, syndications, real estate securities, and other federal tax laws affecting real estate.

**REAL 4407 Income Property Finance (4 Credits)**

This course explores conventional and alternative financing, mortgage banking, law and markets, loan underwriting analysis and the impact of monetary and fiscal policies on the real estate and mortgage markets, with emphasis on decision making from the equity investors point of view. Specific topics include an overview and history of real estate finance, the taxation and legal aspects of real estate finance, compounding and discounting, functions of interest and real estate capital markets and securities. Specific areas of focus are residential property finance, income property finance, and construction and development financing.

**REAL 4417 Income Property Valuation and Appraisal (4 Credits)**

Residential/Commercial appraising, including market cost and income approaches to value, gross rent multiplier analysis, neighborhood and site analysis, valuation of income properties including market cost and income approaches to value, capitalization theory and techniques, mortgage-equity analysis, and investment value concepts. Prerequisite: REAL 4407.

**REAL 4438 Legal Aspects of Real Estate and the Built Environment (4 Credits)**

To gain an understanding of certain legal issues that are repeatedly encountered by real estate and construction professionals.

**REAL 4467 Property Development and Feasibility (4 Credits)**

Commercial real estate development analysis and feasibility includes economic base analysis, tenant demand analysis, development and construction cost analysis, lease-up analysis, financial feasibility, leasing and property management practices. Five major property types (office, industrial, retail, apartment and hotel) are covered. Prerequisite: REAL 4407.

**REAL 4477 Income Property Investment (4 Credits)**

Comprehensive analytical framework for real estate investment decision-making, equity investment decisions via discounted cash flow, and risk analysis models and strategic planning concepts, structuring parameters to maximize rates of return while controlling downside risks; emphasis on theory, concept building, and practical application to various types of investment properties. Prerequisite: REAL 4007.

**REAL 4701 Topics in Real Estate (1-5 Credits)****REAL 4800 NAIOP Challenge (2-4 Credits)**

A unique non-traditional course, where the students will work on a complex real estate problem culminating in an internal competition and external competition which includes a written report and an oral presentation. Cross listed with CMGT 3800, CMGT 4800, REAL 3800.

**REAL 4890 Internship (0-4 Credits)**