

# Construction Design and Management Program Overview

The ***Construction Design and Management*** program will be a four course Career and Technology Education Program of Study. Students will develop an understanding of the built world through the design and construction process. Each course will use a variety of teaching methodologies including project-based learning. Students will be engaged in each phase of the design and construction process as well as the construction management process. The following is a description of each course.

## ➤ **Course I – Introduction to Construction and Design**

This course provides an overview of the design and construction process as well as an introduction to the many career options within the field of construction. Students will be introduced to core concepts in design and construction including: construction methods and materials; fundamental elements of design; and innovative technologies including Green Construction and Design. Students will be introduced to design software as they complete basic design projects, such as floor plans. In addition, students will begin to develop a better understanding of the fields' interrelationships.

## ➤ **Course II – Principles of Construction Design**

This course provides students with an in-depth understanding of the construction design process. Students will complete a series of increasingly complex construction design projects in which they incorporate all aspects of the construction process, including zoning and regulation requirements; surveying; and project planning. Students will use design software to generate site plans (topography) as well as detailed building plans. The use of portfolios is introduced as a means of showing the developmental stages of a design project. Students will use 3D computer software to complete projects.

## ➤ **Course III – Advance Design and 3-D Modeling**

Students will work in teams to fully develop designs and a construction management plan for a pre-determined site. In this year-long project, students begin with the legal description and topography of the site and develop a proposal for development. The construction design project must meet the client's needs, budget, and the site characteristics. Students will generate a series of plans to be included with the proposal for submission to an industry review panel for approval.

## ➤ **Course IV 4 – Advanced Construction Management**

This course builds on an understanding of the construction design process to advanced knowledge and skill in construction management. In this course, students will be required to work in teams to complete a development project from existing plans. The year-long project will focus on building codes and standards, coordination of the construction process, estimating, planning and scheduling; and site management.

# CDM Technical Strands

## Construction Design and Management

- 1. Construction Methods and Materials**
  - a. Introduction to the Trades (carpentry, electrical, plumbing, HVAC)
  - b. Construction Process
  - c. Building Materials / Systems
  - d. Green Construction
  - e. Construction Safety / OSHA
  - f. Environmental Safety (also in strand 6)
  - g. Building Codes, Standards and Specifications
- 2. Introduction to Design**
  - a. Drafting Techniques
  - b. Blueprint / Plan Reading
  - c. Building Layout
  - d. Foundations
  - e. Mechanical and Electrical Systems
  - f. CADD (2D and 3D)
- 3. Advanced Design and Modeling**
  - a. Building Information Model (BIM)
  - b. Technological Innovations in Construction
  - c. Green Design/LEED
  - d. Building Codes and Standards
  - e. Building Specifications
- 4. Construction Management**
  - a. Construction Estimating
  - b. Project Planning and Scheduling
  - c. Construction Field Operations
  - d. Site Supervision and Management
  - e. Facilities Management
  - f. Construction / Contract Law
  - g. Leadership and Communication
  - h. Financial and Accounting Systems
  - i. Human Resources and Labor Relations
  - j. Inspections
- 5. Overview of the Construction Industry**
  - a. Construction Trades
  - b. The Design-Build Process
  - c. Career Opportunities in Construction
  - d. Communication Requirements (written and oral)
  - e. Ethics in Construction
- 6. Green Construction / LEED**
  - a. Materials and Methods
  - b. Waste Management
  - c. Sustainability
  - d. Energy Conservation
  - e. Technological Innovations
  - f. Environmental Safety
- 7. Construction Surveying**
  - a. Survey Technology
  - b. Site Selection / Planning and Zoning
  - c. Site Management
  - d. Environmental Controls
- 8. Quality Control / Management**
  - a. Business Fundamentals
  - b. Construction Ethics
  - c. Code Proficiency
  - d. Construction / Contract Law
  - e. Quality Control (punch list)

