COURSE SYLLABUS

Construction Course Online

Gain a thorough understanding of the building construction process, from initial site work to final system installations. Learn the essential skills to navigate every phase of construction and prepare for careers in the construction industry.

> Group classes (Live Online) and onsite training are available for this course. For more information, email partnerships@vdci.edu or visit: https://vdci.edu/courses/construction-fundamentals-course



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Course Outline

This package includes these courses

- Site Utilities & Foundation Construction Course Online (10 Hours)
- Building Structure Course Online (10 Hours)
- Building Enclosure Course Online (10 Hours)
- Interiors & Finish Work Course Online (10 Hours)
- Fundamentals of MEP for Buildings Course Online (20 Hours)
- Building Construction Fire Protection Course Online (10 Hours)
- Construction Materials Course Online (30 Hours)

Attend up to two (2) of these elective courses for free (all are optional).

- Commercial Blueprint Reading Course Online
- Residential Blueprint Reading Course Online
- Intro to Construction Estimating Course Online

Site Utilities & Foundation Construction Course Online

Build a strong foundation in construction site preparation and foundation placement with this introductory course in the Construction Fundamentals series. You'll learn how construction teams operate on-site, explore different soil types and subsurface conditions, and understand the equipment and heavy machinery used during site work. The course also covers site utilities, earthwork, excavation support, and foundation installation, along with the history of concrete, concrete as a material, and the role of grade beams and foundations. Designed to be practical and job-ready, this course gives you the knowledge needed to handle real-world construction challenges with confidence.

- Key concepts of site utilities, including water, sewer, and drainage systems.
- Best practices for planning and performing earthwork, such as excavation, soil compaction, and grading.
- Detailed overview of foundation systems, including shallow and deep foundations.
- How to analyze and interpret soil reports to guide foundational decisions.

- Methods for ensuring site safety and compliance with construction codes and standards.
- Techniques for coordinating utility installations with other site development activities.
- Insights into sustainable site development to minimize environmental impact.

Building Structure Course Online

Strengthen your understanding of building structures with this course, part of the Construction Fundamentals course series. You'll gain an in-depth knowledge of structural systems, including techniques and best practices for design and evaluation. Learn how to assess structural components, make informed design decisions, and apply industry standards to ensure safety, stability, and efficiency.

- Understand how structural systems support and distribute loads.
- Key concepts of material properties, such as strength, durability, and load-bearing capacities.
- Techniques for assessing structural stability and identifying potential risks.
- How to interpret structural drawings and effectively communicate with engineers and construction teams.
- The principles of sustainable building practices to optimize performance and reduce environmental impact.
- Real-world applications of structural codes and regulations for safety and compliance.

Building Enclosure Course Online

Enhance your construction expertise by mastering the critical element of building enclosures. This course, part of the Construction Fundamentals course series, teaches you how to design and construct durable, energy-efficient building enclosures that maintain structural integrity, comfort, and environmental control. You'll learn about key components like exterior walls, cladding systems, roofing, and curtain walls, along with strategies for moisture and thermal control.

- Understanding the primary functions and components of building enclosures (walls, roofs, foundations).
- Controlling thermal, moisture, and air flow to improve energy efficiency.
- Selecting appropriate materials based on climate, budget, and building use.
- Identifying and addressing common issues like moisture intrusion and thermal bridging.
- Implementing sustainable practices to reduce environmental impact.
- Collaborating effectively with professionals to optimize building enclosure performance.

Interiors & Finish Work Course Online

This course focuses on the detailed work that brings a project to completion, emphasizing both interior finishes and site components for buildings. It is the fourth course of the Construction Fundamentals course series. You will learn about the different types of walls and interior partitions, the sequence of building interior partitions, different types of drywall and drywall finishes, the construction sequence for finishes, different options for paint, flooring, ceilings, and casework, and the sequence for installing specialties and furniture options.

- Learn about the intricate steps involved in completing building interiors, from drywall installation to painting, millwork, and flooring.
- Understand the principles of exterior site work, including paving, hardscapes, landscaping, and site furniture installation.
- Explore the variety of materials used in finishes, their properties, and their best applications to ensure durability and aesthetic appeal.
- Master the techniques needed to communicate effectively with design, construction, and subcontractor teams to execute finishing phases seamlessly.
- Gain expertise in assessing project quality, ensuring compliance with design specifications, and performing final inspections.

- Learn to manage budgets and timelines specific to the finishing phases of a construction project.

Fundamentals of MEP for Buildings Course Online

Understanding MEP systems is a critical foundation for construction and design projects and is the focus of the fifth course in the Construction Fundamentals series. This course introduces the essential principles of Mechanical, Electrical, and Plumbing systems that support building performance, efficiency, and safety, including HVAC systems and controls, thermal comfort, indoor air quality, and plumbing for domestic water.

- Discover the fundamentals of HVAC (Heating, Ventilation, and Air Conditioning) and how these mechanical systems contribute to occupant comfort and building performance.
- Explore the components of building electrical systems, including power distribution, lighting, and low-voltage systems such as AV, telecom, and data.
- Learn the principles of plumbing systems, including water supply, drainage, and waste systems, and their role in maintaining hygiene and safety in buildings.
- Understand how MEP systems integrate within a project and the importance of designing them for efficiency, sustainability, and cost-effectiveness

Building Construction Fire Protection Course Online

This course, the final course in the Construction Fundamentals Series, covers the critical startup, testing, and closeout phases of fire protection systems in building construction. You'll learn to ensure fire suppression and alarm systems are designed, installed, and maintained according to industry standards. Key topics include wet-pipe and dry-pipe fire suppression systems, fire alarm components, life-safety requirements, and final MEP activities. By the end of the course, you'll gain practical knowledge of compliance with fire safety codes and regulations.

- Designing and installing fire protection systems, including wet-pipe and dry-pipe suppression systems.
- Conducting startup, testing, and inspection of fire protection systems.
- Understanding fire safety regulations and ensuring compliance.
- Documenting system performance and ensuring quality assurance.
- Troubleshooting and resolving issues during system commissioning.
- Communicating effectively with engineers, inspectors, and stakeholders.

Construction Materials Course Online

The course provides a clear, practical overview of the materials and systems used in both residential and commercial construction, from concrete foundations through roofing systems. It covers how key construction materials are used, their properties, and sustainability considerations, giving you the knowledge needed to make informed decisions on construction projects.

- Understand the properties and uses of essential construction materials, including concrete, steel, wood, and more
- Explore the latest innovations in sustainable and green construction materials
- Learn how to evaluate and select the appropriate materials for various project requirements
- Gain practical knowledge on applying materials in both residential and commercial contexts
- Develop skills to assess material performance, durability, and cost-effectiveness
- Discover industry trends and best practices for using materials in modern construction projects