virtual design & construction institute
3904 Groton Street San Diego California 92110 619-758-9300 learn@vdci.edu

Civil 3D Technology Certificate Program

Program Description – 270 Clock Hours of Instruction
Program Completion Time – 7 Months
Upon Completion – VDCI Professional Technology Certificate Awarded

Civil 3D
In today's environment of infrastructure improvement, there is a growing demand for competent engineering/construction/design engineering technicians knowledgeable in the application and integration of civil engineering-based Civil 3D (C3D) software programs. The Civil 3D courses at the Virtual Design & Construction Institute provide students the opportunity to obtain a certificate in these areas. The classes are designed to provide students an opportunity to learn relevant skills and technical knowledge used in a variety of construction industry-focused disciplines. The curriculum is based on the current professional skill sets required by offices specializing in infrastructure improvement and civil engineering. The lessons learned and exercises practiced are based on current, industry Civil 3D-required skills.

Civil 3D Technology Certificate Completion Requirements

Students must complete 270 Clock Hours of Required and Elective Courses

Students must complete all courses with a 70% (C-) or better to complete the program.

Students must satisfy the 80% minimum attendance policy to complete the program.

Course Clock Hours

The VDCI program awards clock hour credits for all online and onsite courses completed. All clock hours are the equivalent of the required onsite hours. (i.e., a 20-unit online clock hour course is the equivalent of a 20-unit onsite clock hour course). VDCI operates on clock hours only. There is not any conversion to credit hours used at the institute.

In VDCI defined Lecture courses, the students are expected to watch (and again, re-watch) video-based lectures to prepare themselves for the online assessments. In VDCI defined Project-Based courses, the students are expected to watch and re-watch video-based lectures, but the lectures are designed to work through a real-world project. This real-world project reinforces the students' learning of the tools, workflows, and industry insights, but the students are not expected to perform work outside of the video-lectures. 100% of the student projects are performed in the video lectures.

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Course Number	Course Name	Number of Clock Hours		
Required Courses				
Students must complete 210 Clock Hours of Required Courses. Does not include prerequisites.				
CAD 101	Introduction to AutoCAD	30		
CAD 201	Intermediate AutoCAD	30		
C3D 301	Introduction to Civil 3D	30		
C3D 302	Intermediate Civil 3D	30		
C3D 303	Civil 3D Construction Documents	30		
PFC 501	Certificate Completion Practical	60		
Elective Courses				
Students must complete at least 60 Clock Hours of Elective Courses				
BIM 101	Introduction to Revit	30		
BIM 201	Intermediate Revit	30		
BIM 301	BIM Construction Documents 1	30		
BIM 302	BIM Construction Documents 2	30		
BIM 303	BIM Detailing	20		
BIM 304	BIM Project Management	20		
BIM 321	Revit MEP 1	30		
BIM 322	Revit MEP 2	20		
BIM 341	Revit Structure 1	20		
BIM 342	Revit Structure 2	30		
BIM 361	Navisworks 1	30		
CAD 301	CAD Construction Documents 1	30	Strongly Recommended	+
CAD 302	CAD Construction Documents 2	30	Strongly Recommended	+
CAD 304	CAD Detailing	20		
CAD 311	CAD Project Management	20		
DAC 211	Introduction to SketchUp	20		
DAC 212	Intermediate SketchUp	20		
DAC 101	Introduction to Photoshop	30		
DAC 201	Intermediate Photoshop	30		
DAC 121	Introduction to Illustrator	30		
DAC 221	Intermediate Illustrator	30		
DAC 141	Introduction to InDesign	30		

DAC 241	Intermediate InDesign	30
PFC 101	Blueprint Reading for Residential Construction	10
PFC 102	Blueprint Reading for Commercial Construction	20
CFC 101	Overview, Site Utilities, Earthwork & Foundations	10
CFC 102	The Building Structure	10
CFC 103	The Building Envelope	10
CFC 104	Interiors and Finish Site Work	10
CFC 105	Mechanical, Electrical, Plumbing & AV-Tel-Data	20
CFC 106	Fire Protection, Startup/Testing & Closeout	10

Career Options

The following list is a sample of disciplines that employ people with a strong, working knowledge of Civil (Engineering) CAD skill sets. Some areas require that their employees have professional training and/or experience in addition to the technical training learned at the Virtual Design & Construction Institute:

Job Title	SOC Code	
CALTRANS Staff	11-3071	Green
Civil Engineering Drafters	17-3011	
Civil Engineers	17-2051	Green / Bright
Construction Managers	11-9021	Green / Bright
Coastal Commission Engineers	19-2041	Green / Bright
Contractors	11-9021	Green / Bright
Electrical Engineering Technicians	17-3023	Green
Engineering & Construction Managers	17-2071	Green
Engineers, All Other	17-2199	
Facilities Engineers	11-9141	Bright
Industrial Designers & Engineers	17-2112	Green / Bright
Infrastructure Engineers	19-3099	Green
Mechanical Engineers	17-2141	Green
Mechanical Engineering Technologist	17-3029	Green
Storm Water Engineers	11-9121	Green / Bright
Site Surveyors	17-1022	Bright
Transportation Engineers	17-2051	Green / Bright
Urban Planners	19-3051	Green / Bright
Utilities Engineers	17-2199	Green

The Civil 3D Professional Technology Certificate is designed to provide students with the skills and technical knowledge requested by employers using Computer-Aided Design (CAD) and Building Information Modeling (BIM) software. The certificate program focuses on the development of fundamental drafting and CAD and BIM skills and problem-solving strategies. Please see the Course Descriptions for further information on class content.

Type of Credential Awarded Upon Graduation
At the completion of a VDCI Civil 3D Technology Certificate Program, students will be awarded a Certificate of Completion for the Program.

Curriculum Design
The VDCI Civil 3D Professional Technology Certificate curriculum is built around how civil engineers, architects, contractors and trades professionals use Civil 3D software in their businesses for project documentation. The VDCI Civil 3D Certificate Program includes exposure to AutoCAD, so that people using Civil 3D will understand the similarities and differences between AutoCAD and Civil 3D.

There are six focus areas of study which can be included in the required and elective courses for this technology certificate:

(7) BIM (Building Information Modeling) Classes – using Revit and Navisworks
(8) CAD (Computer-Aided Design) Classes – using AutoCAD
(9) C3D (Civil 3D) Classes – using Civil 3D
(10) CFC – Construction Fundamentals Classes
(11) DAC Digital Arts (Visualization) Classes – using Photoshop, Illustrator & InDesign
(12) PFC (Professional Fundamentals) Classes – Blueprint Reading, Construction Estimating and the Technology Certification Completion Practical (required to ear the technology certificate)

<u>BIM – Building Information Modeling Classes</u> – Revit is the construction-industry standard software program for BIM (Building Information Modeling). In Revit, students create a 3D model of a project and extract the construction drawings and details directly from the BIM model. The lessons learned in the successive Revit courses build upon previous courses. By the completion of the Revit series of classes, a complete set of construction documents will be built for a moderately complicated commercial project. Today, Government, Military, Hospital, Education and other similarly scaled projects require that their work be completed in Revit (BIM).

It is becoming increasingly common for construction managers to run 3D interference checks on the Revit (BIM) model using **Navisworks**. As an example, Navisworks analyzes where the mechanical, plumbing, structural and other disciplines' design work are occupying the same location in the building. By identifying these interferences during design, significant dollars are saved during construction, and change orders are significantly reduced. Today, most Government, Military, Hospital, Education and other similarly-scaled projects require that their work be analyzed

in Navisworks.

CAD – Computer-Aided Design Classes – Students begin their study of Computer-Aided Design (CAD), using **AutoCAD**. AutoCAD is the construction industry standard for 2D project documentation. AutoCAD is used at all levels and by all disciplines in the construction industry - including facilities people, sound engineers, trades professionals and solar power people, to name a few. In the VDCI introductory, intermediate and advanced construction documentation classes, students will learn AutoCAD, starting at the very beginning. As their skillsets evolve, they will create construction documents for two residential projects. By the completion of our AutoCAD series of classes, a complete set of construction documents, including details, will be built for a moderately complicated residential project – a project worthy of presentation during a job interview.

C3D – Civil 3D Classes – The Civil 3D courses provide the student with an excellent working knowledge of the capabilities of this program. The Civil 3D classes focus on creating and editing infrastructure systems and also on site development. Students are exposed to public 3D/virtual databases and learn about 3D data management and project file sharing through web-based technologies such as project FTP, MILCON, and city/state/national databases. Coursework integrates with CALTRANS and other public agency requirements and databases.

CFC – Construction Fundamentals Courses – These courses are designed to teach real-world, practical information which is regularly learned as on-the-job-training. These courses were designed and prepared by a construction project manager with extensive experience on multi-story commercial buildings. By taking these courses, students will learn about the systems and materials which are installed as well as becoming very familiar with the terminology used by construction industry professionals.

DAC – Digital Arts (Visualization) Classes – Most clients want both technical documentation on their projects and renderings and animations, to better assist in seeing the project. The Adobe suite of software is the market dominant software for graphic design and creative expression. Photoshop is a powerful raster-based editing tool, used primarily for digital painting and photo editing. Illustrator is a vector-based design tool, used for scalable graphic design. InDesign is a layout-focused tool that many firms use to develop their print and digital documentation.

In the AEC industry professionals often rely on visualization software that is outside the traditional AEC software lineup. Adobe has historically focused upon the creation of multimedia and creativity software products, with a more recent focus towards digital marketing software. VDCI has included Adobe Photoshop, Illustrator and InDesign for digital marketing as it is a common workflow to finish AEC projects.

PFC – Professional Fundamental Classes – People working in the construction industry must know how to understand and work with construction documents. "Blueprint" is the historic name for construction documents. Architects, engineers and designers create the construction documents

(blueprints). Proposals and bids are developed off blueprints. Contractors build their projects based on the information provided on the blueprints. The VDCI Blueprint Reading classes include lectures, hands-on demonstrations and lab exercises to familiarize students with blueprint reading and understanding the connectedness between different drawing sheets within a set of blueprints.

In the PFC501 Technology Certificate Completion practical, students demonstrate an understanding of the inter-relationship between the software programs learned in their Technology Certificate courses. They work 1:1 with their instructor, and design their own project deliverable, develop an implementation plan, evaluate the best methods to successfully complete their Certificate Completion Practical and ultimately create a project which uses the software programs learned throughout their Technology Certificate. By the completion of this course, students will apply the skill sets learned from all of their previous courses. The Certificate Completion Practical will be comprehensive and will be of a quality so that it can be presented to a potential employer as an example of a project which the student has designed and executed themself.

Licensing Requirements

There are not any licensing, registration or certification examination requirements which are mandatory for the VDCI Certificate Programs.

The Autodesk and Adobe Certification Exams are optional, are not required by industry and do not lead to professional licensure. Passing the Autodesk Certified User or the Autodesk Certified Professional, and/or the Adobe Certified Associate or the Adobe Certified Expert Exams demonstrate to the participant (student), and to their employer, that the participant (student) has achieved a satisfactory command of the domain objectives which align with the Certification Exams.

VDCI courses which focus on Autodesk and/or Adobe software skills incorporate Autodesk and/or Adobe Certification Objectives into the course curriculum. The format of VDCI quizzes aligns with the format of questions asked in the Certification Exams.

VDCI directs students who choose to take an Autodesk and/or Adobe Certification Exam to areas of the Autodesk and/or Adobe website which specifically prepares students to take an Autodesk Certification Exam.