Colorado CTE Course – Scope and Sequence

Course Name	Building Modeling		Course Details	Credit= 0.5
			Course = 0.50 Carnegie Unit Credit	**CTE Credential: CTE Architecture and Construction**
Course Description	This introductory course in Building Information Modeling (BIM) focuses on CAD Construction Industry applications as a platform for learning key principles in the application of digital media in the design and documentation of building elements within a parametric environment. Fundamental training is provided, so students can progress to more advanced design computation and its application in the construction industry. Through a series of lectures and exercises, this course explores basic BIM concepts that apply to all parametrically driven CAD systems. (*This course covers all competencies of CAD 224 if course delivered using Revit software.)			
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.			
SCED Identification #	21107	Schedule calculation based on 60 calendar days of a 90-day semester. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.		
All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at **https://www.cde.state.co.us/standardsandinstruction/essentialskills**				

Instructional Unit Topic	Suggested Length of Instruction	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
Overview of Building Information Modeling		Define building modeling and understand its application in the construction industry. Identify building modeling software functions and manufacturers. Understand the benefits of building modeling software to project communication and project management.	Student is expected to: A) Define building modeling and understand its application in the construction industry; B) Describe how BIM can be used as a communication and collaboration tool, and its contributions to Scheduling,		

			Estimating, and Facility Management; C) Identify Manufacturers BIM Objects Cataloging features and websites; and D) Explain the process of implementing BIM and how BIM-based designs for structural, mechanical, electrical, plumbing, communications, security, fire protection fit into the overall construction document fabric.		
Structural Design and Materials		Identify common construction products and materials used in residential and commercial construction projects. Understand survey techniques and other measuring skills used in the drafting and design of construction projects. Understand physical and chemical considerations of materials for construction projects.	Understand the structural and material design considerations for design and drafting of construction projects. Student is expected to: A) Understand common construction concepts and terminology; B) Identify basic construction materials used in construction; C) Differentiate between the various types of material		

		Identify design considerations related to environmental and other factors for drafting and designing construction projects.	properties and their applications; D) Understand the lifecycle of a product and its impacts for building construction; E) Understand measuring and scaling techniques for materials and as applied to design conventions; F) Discuss the impact of material usage on the environment; and G) Understand conformance references and testing techniques for various engineering materials used to build a structure.		
BIM software **I. Use of Revit user interface commands** **II. Creating New Projects** **III. Opening, Saving & Closing** **IV. Navigating around a model** **V. Constructing Model Wall, Floor,**		Use building information modeling to create construction project designs and drawings.	Understand and use building model software. Student is expected to: A) Discuss the BIM* user interface. B) Practice creating and starting a new Project from various templates. C) Review the steps necessary to Open, Save & Close an existing Project.	I. Use of Revit user interface: A. Ribbon: Tabs & Panels B. Properties C. Project Browser D. View Control Bar E. Methods of entering commands II. Creating New Projects A. Browse for available Templates III. Opening, Saving & Closing A. Opening and closing existing Projects	

Ceiling, and Roof Systems **VI. Use of Curtain Walls** **VII. Composing different Wall, Floor, Ceiling, & Roof Types**				D) Demonstrate the ability to navigate around a model. E) Construct Model Wall, Floor, Ceiling, and Roof Systems. F) Generate basic Curtain Wall components and apply them to the Model. G) Compose different Wall, Floor, Ceiling, & Roof Types by Duplicating existing Types. H) Generate and integrate into the Model basic Vertical Circulation elements: Stairs, Ramps, & Railings. I) Apply Components: Doors, Windows, Light Fixtures, & other Components. J) Manage variations of Door and Window Components by Duplicating existing Types. K) Create additional Plan Views. L) Differentiate Building and Interior Elevations.	B. Revit file compatibility with previous versions. C. Automatic backup files: .0001.rvt IV. Navigating around a model A. Switching Views in Project Browser B. Switching Views by clicking blue links C. Pan D. Zoom E. Orbit F. Set project levels and grids to layout model horizontally and vertically. V. Constructing Model Wall, Floor, Ceiling, and Roof Systems: A. Exterior & Interior Walls B. Constructing Floors C. Creating Ceilings D. Assembling Roofs E. Picking Walls F. Extending into Wall (to core) VI. Use of Curtain Walls A. Using Wall tool to model Curtain Walls. B. Adding Curtain Grids to host Mullions. C. Adding Doors by replacing Panels. D. Creating custom Curtain Walls VII. Composing different Wall, Floor, Ceiling, & Roof Types	

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				M) Contrast Building and Wall Sections. N) Employ Tags and create Schedules & Legends. O) Apply Annotations to complete Detail Views. P) Complete a construction document set. Q) Create Photo Realistic Rendering, and Walkthroughs	A. Editing Type: Duplicate B. Editing Assembly: Function C. Editing Assembly: Core Boundary D. Arranging layers in relation to core boundary and understand how different function designations inform how walls, floors, ceilings and roofs join together.	