

Wyoming Department of Education Required Virtual Education Course Syllabus

BIG HORN COUNTY SCHOOL DISTRICT #1

Program Name	WYCA	Content Area	Vocational Education
Course ID	CAOT78167	Grade Level	9, 10, 11, 12
Course Name	3D Computer Modeling B	# of Credits	0.5
SCED Code	10203G0.5011	Curriculum Type	Connections Academy

COURSE DESCRIPTION

Are you interested in a career in technology? Are you curious about working in fields like virtual reality, video game design, marketing, television and motion pictures, or digital imaging? If so, 3-D Computer Modeling is a great place to start as it is the foundation for all these career paths. The student will gain a deeper understanding of graphic design and illustration as he uses 3-D animation software to create virtual three-dimensional design projects. None in on drawing, photography, and 3-D construction techniques and develop the skills needed to navigate within a 3-D digital modeling workspace. This course is an excellent introduction to careers in the fast-growing field of technology and design.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK
CV12.1.1	College and career-ready students evaluate current knowledge and interests in order to set career goals.
CV12.1.2	College and career-ready students explore careers including outlook, salary, needed training, duties and lifestyle utilizing all available resources including mentors and industry experts.
CV12.1.3	College and career-ready students prepare an educational and career plan to enable them to gain desired knowledge and experience.
CV12.3.3	College and career-ready students employ valid and reliable research strategies and apply prior knowledge to solve a problem or complete a project.
CV12.4.1	College and career-ready students produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
CV12.4.2	College and career-ready students determine the meaning of symbols, key terms, and other content-specific words and phrases as they are used in technical context.
CV12.4.3	College and career-ready students acquire, manipulate, analyze, diagnose, and/or report information, using the appropriate technology.
CV12.4.4	College and career-ready students precisely follow a complex multistep procedure when performing technical tasks.
CV12.5.1	College and career-ready students manage resources to develop, analyze, and implement systems and applications.
CV12.5.2	College and career-ready students productively complete tasks taking constraints, priorities and resources into account.
CV12.5.3	College and career-ready students safely and ethically use current industry-standard tools and emerging technologies.
CV12.5.4	College and career-ready students utilize technology to develop innovative solutions or products.

SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OUTCOMES
Unit 1: The Power of Light and Shade The right lighting can change a scene to reflect a lot of different moods.	CV12.5.1, CV12.5.2, CV12.5.4, CV12.4.2, CV12.4.1	Understand the basics of lighting and shading Discuss different lighting techniques and their applications
Unit 2: 3-D Geometrics It's often hard to tell how much work and talent goes into 3-D modeling just by looking at it. In fact, models that are done well are deceptive in	CV12.5.1, CV12.5.3, CV12.5.4, CV12.4.2, CV12.4.3, CV12.4.4, CV12.4.1	Use the Cartesian Grid to navigate Blender Use basic geometry principles to design simple Blender assets Apply Blender's Transforms and Modifiers to 3-D objects
Unit 3: Texturing As we know, 3-D modeling and animation is centered on the need to create realistic objects in a virtual environment. If you are trying to	CV12.5.1, CV12.5.2, CV12.5.3, CV12.5.4, CV12.4.2, CV12.4.4, CV12.4.1	Explain the technical concepts behind texturing Discern basic materials and textures Apply texture to 3-D models and environments
Unit 4: Rendering One of the most important parts of 3-D modeling is the final product. Without it, the skill, hard work, and technical knowledge you have cultivated has no real purpose. And that's precisely why rendering is such a vital topic—it is the process that allows you to finally achieve the scene, object, or model from your artistic vision. As such, rendering determines the way light and shadow play on objects and whether realism has been achieved. Part of this process uses mathematics to create complex computations, while other parts rely on the artist's sense of how light works. In that way, rendering is an interesting combination of the technical and the artistic and one of the most exciting aspects of 3-D art.	CV12.4.4, CV12.5.1, CV12.4.2, CV12.5.4, CV12.4.1, CV12.5.3, CV12.5.2	Create a 2-D image or video from your 3-D scene in Blender Generate an effective render that brings your 3-D model to life Understand render engines and know what to look for when selecting a render engine Light a scene for ideal rendering Set the camera in place and point it in the right viewing direction for an effective render
Unit 5: Environmental Models Believable environments with accurate renderings are not just entertaining—they also have meaningful applications in the real world. From architecture to gaming to engineering to geology, the process of environmental modeling offers industries and enterprises effective ways to generate data, apply information, and analyze outcomes. And with such a valuable tool, there are few industries that cannot benefit from it in some way. Using the methods and skills of a 3-D modeler, it is possible to implement change through a variety of outlets, which makes it one of the most exciting and versatile fields around.	CV12.4.1, CV12.4.2, CV12.4.4, CV12.5.1, CV12.5.4, CV12.3.3	Identify the use of 3-D models in various industries Use modeling techniques and software to create an environmental model Understand how 3-D simulation is applied in the real world Explain how environmental models impact the larger field
Unit 6: Molding Your Future If you have ever played a high-quality computer game, you know that realism can be found outside of the natural world. The faces, the places, and the objects within that man-made world are so life-like it's hard to grasp how they were created in the first place. By now, you likely have a clearer understanding of exactly what it takes to reach this artistic point in the 3-D world. With this knowledge, it is possible for you to be the one creating those mind-blowing games, the ones capable of transcending people from their regular lives into an imaginary one without boundaries or definition. It is pretty exciting stuff! These kinds of creative jobs feel less like "work" and more like fantastical play. But, indeed, they are jobs.	CV12.1.2, CV12.1.1, CV12.1.3, CV12.4.1, CV12.4.2, CV12.5.3, CV12.5.4, CV12.4.4	Understand software processes and some of the major techniques used in 3-D modeling Identify industries where you could apply your 3-D modeling skills at the professional level Understand the necessary steps to implementing these skills into a future career Create your own e-portfolio to display your 3-D modeling talents