



3D Techniques Syllabus CHS Business Department

Contact Information: Parents may contact me by phone, email, or visiting the school.

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CCSD Vision Statement: The Chillicothe City School District will provide tomorrow's leaders with a high quality education by developing high expectations and positive personal relationships among students, staff, and community members.

CCSD Mission Statement: The Chillicothe City School District empowers students to learn, to lead, and to serve.

Course Description and Prerequisite(s) from Course Handbook:

3D Techniques - 421 CTAG (potential for college credit) course

State Course#: 145120

Prerequisite: None

Elective

Grade: 10-12

Graded: Conventionally

Credit: 1

CTAG alignment: CTIM007 3-D Modeling and Animation

College Credits: 3 Semester Hours

Students will use current industry standard commercial and open source programming software to create 3-D visual elements in a web or standalone environment. Students will learn aspects of computer visual production, thought, and application; to map out, design, and test three-dimensional elements.

Required: 120 – 150 hours

Course Fee: Students will have the opportunity to be a part of a Career Tech Student Organization (Business Professionals of America) as part of this course. Students who choose to be a part of the program's respective Career Tech Student Organization will have

opportunities to be student officers, attend leadership activities, and participate in various leadership and skill competitions. Students who wish to be a part of the program's respective Career Tech Student Organization will be required to pay the dues associated with the organization prior to participation in activities outside the normal classroom. \$40 for BPA Membership.

Learning Targets: Defined below for clarity are the Unit Titles, Big Ideas of every Unit taught during this course, and the Essential Questions to be answered to better understand the Big Ideas. A student's ability to grasp and answer the Essential Questions will define whether or not he or she adequately learns and can apply the skills found in Big Ideas. This will ultimately define whether or not a student scores well on assessments administered for this course.

- **1st Quarter**

- **Unit I Title: Developer Environment**

- **Big Idea #1:** I can explain the differences between 3D and 2.5D.

- *Essential Question #1: Define 3d as it relates to media.*
- *Essential Question #2: Describe both forms of 2.5D.*
- *Essential Question #3: Explain when you should use 3D and when you should use 2.5D*

- **Big Idea #2:** I can avoid illegal use of other people's works while utilizing my resources.

- *Essential Question #1: What is DMCA and how does it affect what can be used in your project?*
- *Essential Question #2: Explain the differences between creative commons, open source, and public domain.*
- *Essential Question #3: What are the consequences of not following DMCA regulations?*

- **Big Idea #3:** I can select the appropriate software for 3D projects.

- *Essential Question #1: Explain what 3DS Max, Maya, and Blender are used for.*
- *Essential Question #2: What are MudBox and zBrush?*
- *Essential Question #3: What is facegen and how does it work?*

- **Unit II Title: Box Modelling**

- **Big Idea #1:** I can create and manipulate primitive objects.
 - *Essential Question #1: What are the standard primitive models in 3DS max?*
 - *Essential Question #2: : How do you create a primitive model within the current scene?*
 - *Essential Question #3: Why does primitive selection matter when starting a new object?*
- **Big Idea #2:** I can add modifiers to primitives to make unique creations.
 - *Essential Question #1: What are modifiers and how are they used?*
 - *Essential Question #2: What is the modifier stack and why is order important?*
 - *Essential Question #3: List some of the more commonly used modifiers.*
- **Big Idea #3:** I can edit the model using subselections.
 - *Essential Question #1: Describe the four standard subselection types.*
 - *Essential Question #2: What do bevel and extrude do to sub selections?*
 - *Essential Question #3: Explain what smoothing groups are.*
- **2nd Quarter**
 - **Unit III Title: Textures, Materials, and Wrapping**
 - **Big Idea #1:** I can apply textures to my models to give them more detail.
 - *Essential Question #1: Explain what a texture is.*
 - *Essential Question #2: Describe the difference between a texture and a material.*
 - *Essential Question #3: Explain what base grey is and why it's important.*
 - **Big Idea #2:** I can create different effects with materials.
 - *Essential Question #1: Explain what normal maps and bump maps do for a model.*
 - *Essential Question #2: Describe how you would make a model reflective.*
 - *Essential Question #3: What is an alpha layer and how does it affect materials?*
 - **Big Idea #3:** I can properly map a texture to a model.
 - *Essential Question #1: Explain how the UVW Map modifier helps to map textures to a model.*

- *Essential Question #2: How does the Unwrap UVW modifier help with complex models?*
 - *Essential Question #3: Explain why it is important to not overlap polys on a texture map.*
 - **Unit IV Title: Compound Objects**
 - **Big Idea #1:** I can use layers and groups to help organize my scene.
 - *Essential Question #1: Explain what a group is and identify when you might use one.*
 - *Essential Question #2: Explain what a layer is and what benefits it offers.*
 - *Essential Question #3: Describe the differences between layers and groups.*
 - **Big Idea #2:** I can use boolean functions to create new shapes.
 - *Essential Question #1: Describe what using boolean does with 3d objects.*
 - *Essential Question #2: What happens when you use subtraction with boolean?*
 - *Essential Question #3: What happens when you use union with boolean?*
 - **Big Idea #3:** I can use compound objects to help create the environment for my scene.
 - *Essential Question #1: Identify the disadvantages of using compound objects.*
 - *Essential Question #2: Explain what the terrain and scatter compound objects do.*
 - *Essential Question #3: Describe how the morph and loft compound objects are similar.*
- **MID-TERM EXAM**
- **3rd Quarter**
 - **Unit V Title: Creating Characters**
 - **Big Idea #1:** I can create concept art for my characters.
 - *Essential Question #1: Explain the difference between the t-pose and an action pose.*
 - *Essential Question #2: Explain why action poses are difficult to work with.*
 - *Essential Question #3: Describe two methods of adding concept art into a scene to work with.*
 - **Big Idea #2:** I can use concept art to create my characters.

- *Essential Question #1: How do you use box modeling and concept art to create a character?*
 - *Essential Question #2: How do you use splines and concept art to create a character?*
 - *Essential Question #3: Describe benefits and disadvantages of both box modeling and splines for character modeling.*
 - **Big Idea #3:** I can set up my characters to be animated.
 - *Essential Question #1: Explain what a rig is and explain how it is used to animate a character.*
 - *Essential Question #2: Explain what morph target animation is.*
 - *Essential Question #3: Identify which modifiers are used to attach a model to a rig and describe the process of using them.*
- **Unit VI Title: Animation**
 - **Big Idea #1:** I can identify the parts of the timeline.
 - *Essential Question #1: What is a frame and how do you adjust the number of frames in a timeline?*
 - *Essential Question #2: Describe the purpose of a keyframe.*
 - *Essential Question #3: Explain what the auto-key button does and how it is useful.*
 - **Big Idea #2:** I can create an animation using the timeline.
 - *Essential Question #1: Explain what tweening is.*
 - *Essential Question #2: How is a keyframe different from a frame?*
 - *Essential Question #3: Explain how you would animate a rigged model.*
 - **Big Idea #3:** I can use the motion rollout panel to animate my character.
 - *Essential Question #1: Identify the purpose of each of the keyframe tools in the motion rollout panel.*
 - *Essential Question #2: What is a pose and what happens when you paste a mirror of it?*
 - *Essential Question #3: What is a posture and what happens when you paste a mirror of it?*
- **4th Quarter**
 - **Unit VII Title: Advanced Concepts**
 - **Big Idea #1:** I can use textures to manipulate models.

- *Essential Question #1: Explain what happens when a displacement map is used on a model.*
 - *Essential Question #2: Identify the most common use of displacement maps in video games.*
 - *Essential Question #3: How can alpha maps be used to appear to alter the shape of an object?*
- **Big Idea #2:** I can use physics simulations to make my scene more realistic.
 - *Essential Question #1: Explain what the cloth reactor is and how it is used.*
 - *Essential Question #2: Describe the purpose of the spring controller.*
 - *Essential Question #3: How do you add forces to a scene?*
- **Big Idea #3:** I can use particle emitters to add atmosphere to my scene.
 - *Essential Question #1: Explain what a particle emitter is.*
 - *Essential Question #2: What is the relation of a particle to a texture?*
 - *Essential Question #3: Identify the common features of a particle emitter.*
- **Unit VIII Title: Publication**
 - **Big Idea #1:** I can utilize cameras to render visually interesting videos.
 - *Essential Question #1: Explain what a camera is.*
 - *Essential Question #2: Describe what the dollycam affect is.*
 - *Essential Question #3: Why would someone use multiple cameras in a scene?*
 - **Big Idea #2:** I can edit my video in post production.
 - *Essential Question #1: Explain what the nature of post production is.*
 - *Essential Question #2: Why would you use another program to add some special effects?*
 - *Essential Question #3: Why might you render the full scene for every camera when some cameras produce only a few seconds of used video.*
 - **Big Idea #3:** I can prepare the final product for distribution.
 - *Essential Question #1: Explain what elements should be in the final product.*
 - *Essential Question #2: What is a publisher's role in distribution?*

- *Essential Question #3: How does DMCA affect your relation to your publisher?*

- **END OF COURSE EXAM**

Course Materials:

- Google Chromebook
- Flash Drive, 16 GB or greater (Optional)
- Computer lab access
- Project files
- 3DS Max
- Mudbox
- Photoshop
- AfterEffects

Electronic Resources:

- <https://academy.autodesk.com/software/3ds-max>

Course Expectations:

- **Respect your fellow classmates and community.** We practice unconditional positive regard in the classroom.
- **Obey all faculty instructions.**
- **Follow along with lessons during lecture time.** Not paying attention robs yourself and those around you of time for questions and clarifications which goes back to the first item, be respectful.
- **Don't be afraid to be wrong,** especially during lecture/discussion time. The best lectures and usually most rewarding lectures happen when you're brave enough to give an answer that may not be right. This opens up opportunity to learn more and shows that you're taking the time to think about the course content.
- **Complete your classroom projects on time and in the classroom** (they all build upon each other). There will be plenty of opportunity to complete in class work in class. If you have the ability to work on projects at home, then more power to you, but that does not excuse you from using the classroom time to work.
- Begin work on bell ringers before the bell rings and have try to finish it before attendance is complete. You may use Google to help find the answer for bell ringers. This is a tech class and the answers tend to change over the course of a few short years so it's more important that you know how to find and apply the answers than memorizing the answers.

- **Do not give textbook definitions.** Tell us what the definition actually means in your own words. If you provide a textbook definition during discussions, you will be asked to explain your definition as they tend to carry little meaning to most people.
- Respect the lab. **Do not deface or damage any equipment or furniture within it.** Not only is it criminal, but as you are NOT the only person using the equipment, it is disrespectful to the other students. This also means that you should make sure to keep your workspace clean and orderly.

Grading:

Unit Exams	50%
Assessments (Including: Quizzes, Essays, Labs, and Projects)	30%
Class work/Homework	20%

- Each nine week's grade comprises 20% of a student's final grade.
- The Mid-Term Exam and End of Course Exam each comprise 10% of a student's final grade.

Grading Scale:

The grading scale for Chillicothe High School can be found in the student handbook or online at

<http://www.chillicothe.k12.oh.us/1/Content2/studenthandbook>.

Late Work: Late work will be subject to the Board-adopted policy on assignments that are submitted late (to be reviewed in class).

- Regardless of the absence type (excused, unexcused, OSS, etc.), students are expected to make up work and be held accountable for learning all material they missed.
- Any student who is absent from school will receive one (1) additional day for every day he/she missed to make up his/her work for full credit (100%).
- Any student who exceeds the allotted time to turn in an assignment for full credit may still submit work late for partial credit.
 - Any student who turns in work up to 1 week late must at least be given the opportunity to earn 75% on that assignment.
 - Any student who turns in work between 1 and 2 weeks late must at least be given the opportunity to earn 60% on that assignment.
- The end of the 9 weeks is the cut off point for teachers to accept late work from students for full or partial credit unless the

teacher decides to give the student an incomplete for the 9 weeks due to extenuating circumstances.

Performance Based Section: Writing Assignments/Exams/Presentations/Technology

One or more of the End of Unit Exams may be Performance Based. According to the Ohio Department of Education, "Performance Based Assessments (PBA) provides authentic ways for students to demonstrate and apply their understanding of the content and skills within the standards. The performance based assessments will provide formative and summative information to inform instructional decision-making and help students move forward on their trajectory of learning." Some examples of Performance Based Assessments include but are not limited to portfolios, experiments, group projects, demonstrations, essays, and presentations.

CHS 3D Techniques Course Syllabus

After you have reviewed the preceding packet of information with your parent(s) or guardian(s), please sign this sheet and return it to me so that I can verify you understand what I expect out of each and every one of my students.

Student Name (please print):

Student Signature:

Parent/Guardian Name (please print):

Parent/Guardian Signature:

Date:
