COURSE TITLE: **SKETCHUP: 3D Design Across The Curriculum**

WA CLOCK HRS: **30**
OREGON PDUs: **30**
PENNSYLVANIA ACT 48: **30**

NO. OF CREDITS: **3 QUARTER CREDITS**
[semester equivalent = 2.00 credits]

INSTRUCTOR: **Chris Hill**
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COURSE DESCRIPTION:
SketchUp is one of the many free computer applications programs that are taking the professional 3D design world by force. It is a design program that allows the users to create 2D and 3D models. Students can learn the principles of good design while using some of the most cutting edge applications being developed and used professionally. Teachers and students are exposed to a design program that can spark the interest of their students in math concepts and applications, modeling concepts, game design modeling, architecture processes and methods, and engineering problem solving projects. This program has a host of applications for students of all grades and skill levels and can be used in a stand alone career and technical class or integrated into a variety of subjects.

Participants in this course will learn how to download and use the program, explore a number of websites that offer developed lesson plans, and create a SketchUp teaching unit for their class and grade level. There are no additional fees associated with this class.

LEARNING OUTCOMES: Upon completion of this course, participants will have:
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1. Learned how to download SketchUp onto their computer from the SketchUp Website.
2. Developed a strong basic knowledge of all the tools found in this design program.
3. A thorough understanding of, and ability to use, the Tutorials regarding this program.
4. Explored the history and many uses of this program in education and the design industry.
5. Created a classroom lecture/demonstration using SketchUp.
6. Created a project based SketchUp unit to use in their classroom.

COURSE REQUIREMENTS:
Completion of all specified assignments is required for issuance of hours or credit. The Heritage Institute does not award partial credit.

The use of artificial intelligence is not permitted. Assignment responses found to be generated by AI will not be accepted.

HOURS EARNED:
Completing the basic assignments (Section A. Information Acquisition) for this course automatically earns participants their choice of CEUs (Continuing Education Units), Washington State Clock Hours, Oregon PDUs, or Pennsylvania ACT 48 Hours. The Heritage Institute offers CEUs and is an approved provider of Washington State Clock Hours, Oregon PDUs, and Pennsylvania ACT 48 Hours.

UNIVERSITY QUARTER CREDIT INFORMATION

REQUIREMENTS FOR UNIVERSITY QUARTER CREDIT
Continuing Education Quarter credits are awarded by Antioch University Seattle (AUS). AUS requires 75% or better for credit at the 400 level and 85% or better to issue credit at the 500 level. These criteria refer both to the amount and quality of work submitted.

1. Completion of Information Acquisition assignments 30%
2. Completion of Learning Application assignments 40%
3. Completion of Integration Paper assignment 30%

CREDIT/NO CREDIT (No Letter Grades or Numeric Equivalents on Transcripts)
Antioch University Seattle (AUS) Continuing Education Quarter credit is offered on a Credit/No Credit basis; neither letter grades nor numeric equivalents are on a transcript. 400 level credit is equal to a "C" or better, 500 level credit is equal to a "B" or better. This information is on the back of the transcript.

AUS Continuing Education quarter credits may or may not be accepted into degree programs. Prior to registering, determine with your district personnel, department head, or state education office the acceptability of these credits for your purpose.

ADDITIONAL COURSE INFORMATION

REQUIRED TEXT
There is no course text.
All materials are available online.

None. All reading is online.

MATERIALS FEE
All materials are free online. There are no additional fees associated with this class.

ASSIGNMENTS REQUIRED FOR HOURS OR UNIVERSITY QUARTER CREDIT

A. INFORMATION ACQUISITION
Assignments done in a course forum will show responses from all educators who have or are taking the course independently. Feel free to read and respond to others' comments.
Group participants can only view and respond to their group members in the Forum.

Assignment #1: Introduction
Describe your professional situation and why you are interested in this course. Indicate your expectations and your general level of experience and proficiency incorporating digital technology into the classroom.

Assignment #2: Digital Literacy
In 500-750 words, define and explain your understanding of “Digital Literacy.” Knowing that digital media is now a central aspect of most people’s lives, especially young students, explain why and how you think that a 2D & 3D Design and Modeling Program, like SketchUp, can contribute to students’ engagement in their education.

Assignment #3: SketchUp Navigation and Tools
Open the SketchUp site http://www.sketchup.com and follow the directions to download the free version (Educational Use) of the SketchUp program. You can also use the free web-based version if that works best for you.

Review These Videos

Getting Started with SketchUp - Part 1

- Make note and understand the concepts of push and pull, pan, orbit, zoom, axis. Practice and review: https://www.youtube.com/embed/pv7TrGnZ17w?autohide=1&controls=1&showinfo=0

Getting Started with SketchUp - Part 2

- Dimensions, offset, follow-me. Practice and review: https://www.youtube.com/embed/IMHckAysaSY?autohide=1&controls=1&showinfo=0

Getting Started with SketchUp - Part 3

- Colors, 3D warehouse, inferrencing. Practice and review
https://www.youtube.com/embed/ClNfoHVYCzY?autohide=1&controls=1&showinfo=0

Getting Started with SketchUp - Part 4

- Groups, components, hallway table. Practice and review:
https://www.youtube.com/embed/fpLVVpNRC2s?autohide=1&controls=1&showinfo=0

Assignment #4: Initial Creation
Create a Chair or Table.

- Upload your creation (jpg or png) for others to see.

Assignment #5: Concept Review

1. Review any concepts or tools you are struggling with. Use the Sketchup Toolbar Series for reviews on specific skills:
http://www.sketchup.com/learn/videos/60

2. Experiment with each tool to understand the usefulness and ways that they are used in design. Developing a command of these tools is important so that you will be able to maximize the engagement and creativity of your students.

- Eraser
- Rectangle
- Lines
- Arc
- Rotate
- Axes
- Walk
- Paint Bucket
- 3D Warehouse

Assignment #6: House Creation

1. **Create a house that includes:**

- 4 sides (can be various sizes)
- Roof
- At least 1 Door
- 4 Windows
- Texture and color (via Paint Bucket)

2. **Practice perspectives** by walking, orbiting and zooming in and out of the structure you create.

(Note: if you want to elaborate on your project please do. This exercise is so you can master the use of the design tools and have more interfaces with the program.)

Assignment #7: Exploring Resources
Explore the internet to learn how professionals and educators are using SketchUp in the real world. First look up a number of sites that are listed in the bibliography which show how SketchUp is being used in stand-alone technology classes. Second, research sites that share how SketchUp is being used across curriculum to teach math, woodshop, art, and other subjects.

ADDITIONAL ASSIGNMENTS REQUIRED FOR UNIVERSITY QUARTER CREDIT

B. LEARNING APPLICATION
In this section, you will apply your learning to your professional situation. This course assumes that most participants are classroom teachers who have access to students. If you do not have a classroom available to you, please contact the instructor for course modifications. Assignments done in a course forum will show responses from all educators who have or are taking the course independently. ?Feel free to read and respond to others' comments. Group participants can only view and respond to their group members in the Forum.

Assignment #8: Using SketchUp
Create a Project Based Teaching Unit and implement it with your students or other children who are available to you. You may use The Heritage Institute Lesson Plan Template attached, or another of your own choosing. The unit should be designed so that the students have at least three hours of class time, and include a teacher led session that introduces the students to SketchUp. The unit should be created using the following:

- Establish an essential question(s).
- Engage students in various structured learning tasks.
- Represent the way people learn and operate in the real world.
- Allow the students to culminate their learning by creating their own products (projects).
- The project should keep in mind the Six A's: Authenticity, Academic Rigor, Adult Connections; Active Exploration, Applied Learning and Assessment Practices.
- A guide for assessment.

Assignment #9: Presentation
Prepare a Google Slides/PowerPoint presentation for in-service on the importance of digital literacy or the various ways SketchUp can be implemented into a curriculum. Share what you have learned about the power of engaging students by using technology.

Assignment #10: Cross-Curriculum Project (500 Level Only)

Option A) Work with another colleague to develop a cross-curriculum project. Write a 1000 - 1500 word paper describing your plan. Utilize the many ideas and examples that can be accessed on the SketchUp site.

OR

Option B) Another assignment of your own choice, with the instructor's prior approval.

C. INTEGRATION PAPER
Assignment #11: (Required for 400 and 500 Level)

SELF REFLECTION & INTEGRATION PAPER
(Please do not write this paper until you've completed all of your other assignments)

Write a 400-500 word Integration Paper answering these 5 questions:

1. What did you learn vs. what you expected to learn from this course?
2. What aspects of the course were most helpful and why?
3. What further knowledge and skills in this general area do you feel you need?
4. How, when and where will you use what you have learned?
5. How and with what other school or community members might you share what you learned?

INSTRUCTOR COMMENTS ON YOUR WORK:

Instructors will comment on each assignment. If you do not hear from the instructor within a few days of posting your assignment, please get in touch with them immediately.

QUALIFICATIONS FOR TEACHING THIS COURSE:
Chris Hill, M.E.T., received his Master of Educational Technology from Boise State University and currently teaches Marketing, Leadership, and Digital Media at Lake Oswego High School. His diverse teaching experience includes teaching at The International School in Tegucigalpa, Honduras. He is a Google Certified teacher, and is one of fifty educators from across the country who was chosen to participate in the 2011 STEM Institute in Washington D.C. He is a member of the NorthWest Council for Computer Education and the International Society for Technology in Education. He has served as the Technology Coordinator and Activities Director at various schools.

BIBLIOGRAPHY

SKETCHUP: 3D Design Across The Curriculum

There are literally hundreds of websites, blogs and other sources regarding the use of Google SketchUp. Some of the most useful are listed below.

Defkey: https://defkey.com/sketchup-shortcuts

3DVINCI: www.3dvinci.net

This is a site that was developed by an engineer, named Bonnie Roskers. She does workshops, professional consultations and works closely with Google. She has a newsletter which can be subscribed to from her site. Her books are designed using project-based curriculum and she has a number of examples of how 3D modeling is useful in teaching math. She has a "monthly project" that has been found to be fun, free and easy to use. Bonnie also has textbooks that are available for professionals learning the program, that would also work in a Career and Technical class as a stand-alone high school class.

Futurelab: www.futurelab.org.uk

This is a great website out of the UK. For those who are taking on the broader issue of "Digital Literacy," it can serve as a useful guide. It addresses the definition of digital literacy and how digital literacy should be developed and integrated into and across curriculum. If you check it out you might want to download or at least read *Digital Literacy Across the Curriculum, A Futurelab Handbook*.

Google for Educators: http://www.google.com/educators/index.html

This is the official Google site for educators. This site has classroom activities, ideas and other ways that SketchUp can be used in the classroom. It also has additional resources, helps connect to Google Earth, and explains how these two programs interface.

Google SketchUp: http://sketchup.google.com/

This will be one of your greatest resources for using the program. Check out the "Community" tab on the left side of the screen with a variety of resources and social networking sites. SketchUp "Forum" tab takes you to a trouble shooting site as well as a social networking site. The "Gallery" gives you dozens of examples of all the different ways SketchUp is being used by designers and in education.

Sketchucation: http://sketchucation.com

This site is more for professionals and advanced or stand-alone classes.