Center for Professional Development
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Independent Study Course Syllabus

Course Number: STEM-903
Course Title: SketchUp - 3D Modeling For Educators

X Online ☐ Correspondence

Instructor: Eric Westland **Phone number: (435) 625-1399** **Email: eric.westland.fpu@gmail.com** **www.ericfpu.com**	**Units: 3** **Grade Level: Grades 3 to adults.**

Course Description

Students love to draw and create (teachers too!). Add a computer to this mix and students will discover they can create three-dimensional projects using powerful, yet easy to learn, modeling tools along with libraries of 3D objects. This course will introduce you to Google SketchUp, a free program that is powerful enough for commercial applications such as Architecture and Engineering, yet simple enough that a 3rd grader can learn to use it. This course will help you master the basics of SketchUp and explore ways to incorporate it into your instruction, ranging from Social Studies to STEM.

Required texts and course materials

- This course will be taught entirely online.
- FSU Moodle Web Site – Moodle is a learning management system that provides students access to online resources, documents, graded assignments, quizzes, discussion forums, etc. Course content will delivered through the FPU Moodle site, http://ce-connect.fresno.edu/
- Video tutorials and course materials created for this course.
- Supplemental video tutorials referenced in the course.
- Optional Textbook: Google SketchUp: The Missing Manual by Chris Grover, Publisher: O'Reilly Media / Pogue Press, ISBN-13:9780596521462

Course Dates:

Self-paced; students may enroll at any time and take up to one year to complete assignments. You have up to one year from the date of registration, and no less than three weeks (one week per credit), to complete the course.

Student Learning Objectives (SLOs)

Student Learning Outcomes in this course Student will be able to:	**Standards Addressed ***	**CE program SLOs**
1. Create a model in SketchUp.	(NBPTS 2) (NETS-T 1,2,3,4) (McRel Tech 1, 3,4)	CE 1
2. Use tools and concepts necessary to design and draw throughout several phases of a project.	(NBPTS 2) (NETS-T 1,2,3,4) (McRel Tech 3,4)	CE 6
3. Edit models in development.	(NBPTS 1, 4) (NETS-T 1,2,3,4) (McRel Tech 1, 3,4)	CE 6
4. Incorporate projects developed using SketchUp into different curriculum areas.	(NBPTS 1,2,4,5) (NETS-T 1,2,3,4,5) (McRel Tech 3)	CE 2
5. Introduce critical thinking skills to students while developing models.	(NBPTS 1,2,3) (NETS-T 1,2,3) (McRel Tech 4)	CE 4
6. Merge models into a common scene to create a collaborative project.	(NBPTS 1,2,4,5) (NETS-T 1,2,3,4,5) (McRel Tech 4)	CE 4
7. Leverage advanced presentation techniques for viewing and presenting models in 3D to students, families and staff.	(NBPTS 2,5) (NETS-T 1,2,3,4,5) (McRel Tech 1)	CE 6

(* Please refer to the section on **Standards Addressed in This Course)**

National Educational Technology Standards (NETS)

1. Facilitate and Inspire Student Learning and Creativity

Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.

a) Promote, support, and model creative and innovative thinking and inventiveness
b) Engage students in exploring real-world issues and solving authentic problems using digital tools and resources
c) Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes

d) Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments

2. Design and Develop Digital Age Learning Experiences and Assessments

Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS·S.

a) Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity
b) Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress
c) Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources
d) Provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching

3. Model Digital Age Work and Learning

Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.

a) Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations
b) Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation
c) Communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital age media and formats
d) Model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning

4. Promote and Model Digital Citizenship and Responsibility

Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

a) Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources b. Address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources
b) Promote and model digital etiquette and responsible social interactions related to the use of technology and information
c) Develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools

5. Engage in Professional Growth and Leadership

Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

a) Participate in local and global learning communities to explore creative applications of technology to improve student learning
b) Exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others
c) Evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning
d) Contribute to the effectiveness, vitality, and self-renewal of the teaching profession

National Board for Professional Teaching Standards - The 5 Core Propositions – (NBPTS)

1. Teachers are committed to students and their learning.
2. Teachers know the subjects they teach and how to teach those subjects to students.
3. Teachers are responsible for managing and monitoring student learning.
4. Teachers think systematically about their practice and learn from experience.
5. Teachers are members of learning communities.

Standards Addressed in This Course:

National Teaching Standards, Five Core Propositions
www.mcrel.org/standards-benchmarks
McRel.org Technology Standards

Topics, Assignments and Activities

Topic To Be Covered	Assignments and Activities
Introduction	Share a brief introduction of yourself.
An Introduction to SketchUp and 2D Drawing	Reading and video tutorials
Two Dimensional Drawing Exercises	Six two-dimensional drawings, five guided and one related to your teaching area.
3D Drawing Basics	Reading and video tutorials
Your First 3D Project	Model a dog house or project of your choice while following along with the video tutorials
Materials And Textures	Reading and video tutorials while adding materials and textures to your first 3D project.
Components And The 3D Warehouse	Reading and video tutorials
Building a Structure	Modeling a 3D, single-story structure incorporating skills introduced so far. Project is supported by reading and video tutorials.
Culminating Project	A 3D model of your choice that you can incorporate with your teaching.

Technology Requirements

In order to successfully complete the course requirements, course participants will need Internet access, be able to send and receive email, know how to manage simple files in a word processing program, and have a basic understanding of the Internet.

Please remember that the instructor is not able to offer technical support. In the event that you need technical support, please contact your Internet Service Provider.

SketchUp:

SketchUp Make is available free for both the Mac and Windows platforms. Additionally, SketchUp Pro is available for educators with an annual license for free with an annual license. Most states also offer the Pro version for schools.

Moodle:

This course will be delivered totally online. Moodle is a learning management system that provides students access to online resources, documents, graded assignments, quizzes, discussion forums, etc. with an easy to learn and use interface. To learn more about Moodle go to: (http://docs.moodle.org/en/Student_tutorials). There are some student tutorials on the Center for Online Learning website at Fresno Pacific University – http://col.fresno.edu/student.

Moodle Site Login and passwords – (or other online course access information)

Students will need to have internet access to log onto http://ce-connect.fresno.edu. The username and password numbers for moodle access will be sent to you by the university using the email address you submitted at the time of registration. The instructor will then contact you with a welcome letter and login instructions. If you need help with the username and password recovery please contact the Center for Professional Development at (800)372-5505, or (559)453-2000 during regular office hours - Mon-Fri 8:00 am to 5:00 pm.

Getting Help with Moodle:

If you need help with Moodle, please contact the Center for Online Learning (COL), by telephone 1-559-453-3460. Help by phone is available Mon-Thurs 8:00 am to 8:00pm and on Fridays from 8:00 am to 5:00 pm, or by filling out a "Request Services" form at http://col.fresno.edu/contact/request-services. Please identify that you are with the Continuing Education/Independent Studies department.

Evidence of Learning

During this course, students will navigate through the lessons as presented through the content management system (Moodle), communicating with the instructor and presenting thoughts, questions and observations in each module. The instructor will comment/respond/evaluate each unit, checking for mastery of tools and techniques,

redirecting when needed. All assignments will be submitted online through the Moodle class site.

Students will complete all of the class assignments. I will evaluate each class assignment to insure the student understands the skills presented and applies them correctly.

Plagiarism and Academic Honesty

All people participating in the educational process at Fresno Pacific University are expected to pursue honesty and integrity in all aspects of their academic work. Academic dishonesty, including plagiarism, will be handled according to the procedures set forth in the Fresno Pacific University Catalogue. URL http://www.fresno.edu

Instructor/Student Contact

Online Courses: Throughout the course students will be communicating with the instructor and their classmates on a regular basis through the use of asynchronous discussion forums. A "virtual office" is utilized for class questions and students are provided with instructor contact information in the event they want to make phone or email contact. In addition, students are encouraged to email the instructor at any time at eric.westland.fpu@gmail.com. Students will also receive feedback on the required assignments as they are submitted.

Grading Policies and Rubrics for Assignments

Grading

- Students must earn a minimum of 80% to received credit
- A – 90-100%, B= 80-89%, (anything below 80% will not receive credit.)
- Grading policies:
  - The discernment between an A or a B is at the discretion of the instructor based on the quality of work submitted (see assignment rubrics).
  - Coursework falling short of a quality equaling a B or a Credit Grade will be returned with further instructions.
  - All assignments must be completed in order to receive a grade. In addition, all assignments are expected to reflect the quality that teacher-training institutions require of professional educators. If completed assignments do not meet this standard, students will be notified with further instructions from the instructor.

Rubric

Each assignment is evaluated as follows:

	4 - Exemplary (A)	3 - Passing (B or Credit)	2-0 Failing (Needs further work)
Reproduction Quality and Model Accuracy	Model is an excellent representation of the original design plan. All components are present, and in the correct proportion.	Model is a good representation of the original design plan. Most components are present, and in the correct proportion.	Model is a poor and incomplete representation of the original design. Key components are missing. Proportionality was not maintained.
Demonstrated Knowledge of SketchUp	Excellent understanding and use of SketchUp functionality, such as sandbox tools, groups, textures, and objects.	Good understanding and use of SketchUp functionality, such as sandbox tools, groups, textures, and objects.	Minimal understanding and use of SketchUp functionality, such as sandbox tools, groups, textures, and objects.
Creativity & Aesthetics	Beautiful work with original elements such as unique shapes, landscaping, and color/texture use.	Attractive design with original elements such as unique shapes, landscaping, and color/texture use.	Design has limited visual appeal and contains few original elements.
Details	Highly detailed, with a variety of objects, surfaces, and shapes.	Moderately detailed, with a variety of objects, surfaces, and shapes.	Minimal details, with a variety of objects, surfaces, and shapes.
Overall Design Quality	High quality design utilizing many elements available in SketchUp. Form and Function are well-balanced.	High quality design utilizing some elements available in SketchUp. Form and Function are well-balanced.	Poor overall design, utilizing few of the elements available in SketchUp. Form and Function are not balanced.

Final Course Grade and Transcripts

When all work for the course has been completed, students will need to logon to the Center for Professional Development website (http://ce.fresno.edu/cpd) to "Submit Grade Form". Once the instructor fills out the grade form online, students may log back in to request their Grade Report as well as order transcripts online. Please allow at least two weeks for the final grade to be posted. For more information see the Independent Studies Policies and Procedures that were sent to you when you received your course materials, or in your online course. They are available, also at http://ce.fresno.edu/cpd - under General Information > CPD Policies.

Relevant text and online resources that support course content and encourage further investigation.

SketchUp

SketchUp Video Tutorials

SketchUp For Education

K-12 Education Case Studies

- SketchUp In The Classroom - History and Geography
- SketchUp Blog

Google Geo Bee and SketchUp

Exploring Middle Grades Geometry Using SketchUp

SketchUp and Autism - Strengths of Autism shine through in 3D

4th Grade English Language Arts Lesson

SketchUp In The Classroom and Instructional Ideas

SketchUp Case Studies In History, Civics and STEM

Middle School Geometry Lesson Using SketchUp

Integrating Digital Technologies for Spatial Reasoning: Using Google SketchUp to Model the Real World

Google SketchUp: A Powerful Tool for Teaching, Learning and Applying Geometry

Continuing Education Program Student Learning Outcomes:

CE 1. Demonstrate proficient written communication by articulating a clear focus, synthesizing arguments, and utilizing standard formats in order to inform and persuade others, and present information applicable to targeted use.
CE 2. Demonstrate comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts.
CE 3. Reflect on their personal and professional growth and provide evidence of how such reflection is utilized to manage personal and professional improvement.
CE 4. Apply critical thinking competencies by generating probing questions, recognizing underlying assumptions, interpreting and evaluating relevant information, and applying their understandings to the professional setting.
CE 5. Reflect on values that inspire high standards of professional and ethical behavior as they pursue excellence in applying new learning to their chosen field.
CE 6. Identify information needed in order to fully understand a topic or task, organize that information, identify the best sources of information for a given enquiry, locate and critically evaluate sources, and accurately and effectively share that information.

FRESNO PACIFIC UNIVERSITY STUDENT LEARNING OUTCOMES

Student Learning Outcomes Oral Communication: Students will *exhibit* clear, engaging, and confident oral communication – in both individual and group settings – and will critically *evaluate* content and delivery components.
Written Communication: Students will *demonstrate* proficient written communication by *articulating* a clear focus, *synthesizing* arguments, and utilizing standard formats in order to *inform* and *persuade* others.
Content Knowledge: Students will *demonstrate* comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts.
Reflection: Students will *reflect* on their personal and professional growth and *provide evidence* of how such reflection is utilized to manage personal and vocational improvement.
Critical Thinking: Students will *apply* critical thinking competencies by *generating* probing questions, *recognizing* underlying assumptions, *interpreting* and *evaluating* relevant information, and *applying* their understandings to new situations.
Moral Reasoning: Students will *identify* and *apply* moral reasoning and ethical decision-making skills, and *articulate* the norms and principles underlying a Christian world-view.
Service: Students will *demonstrate* service and reconciliation as a way of leadership.
Cultural and Global Perspective: Students will *identify* personal, cultural, and global perspectives and will employ these perspectives to *evaluate* complex systems.
Quantitative Reasoning: Students will accurately *compute* calculations and symbolic operations and *explain* their use in a field of study.
Information Literacy: Students will *identify* information needed in order to fully understand a topic or task, *explain* how that information is organized, *identify* the best sources of information for a given enquiry, *locate* and critically *evaluate* sources, and accurately and effectively *share* that information.