EL PASO HIGH SCHOOL STEM

PROJECT-BASED LEARNING LESSON PLAN

COURSE: Principles of Applied Engineering

UNIT OF STUDY: Introduction to 3D Modeling

TEACHER: Rick Ortiz

PROJECT SCOPE: 30-AUG-2017 — 15-SEP-2017

STANDARDS ADDRESSED: HS.CTE.O.PAE: 3.C, 3.D, 3.E, 6.B, 6.D, 10.A

STUDENT OBJECTIVES:

- Ss will define 3D modeling features: chamfer, fillet, hole, scale, extrude, constraint, dimensions, assembly, part, etc.
- Ss will understand 3D modeling techniques: sweep, revolve, extrude, scale, mirror, pattern, etc.
- Ss will identify the different types of lines in 3D and 2D modeling: object, construction, projection, etc.
- Ss will understand the function of dimensional constraints in 3D modeling.
- Ss will understand the function of spatial constraints in 3D modeling.
- Ss will understand how to create, manipulate, and apply geometry in a 3D modeling environment.
- Ss will understand how parts come together to form an assembly.

PROJECT TITLE: Modeling with Autodesk Inventor

INSTRUCTIONAL MATERIALS:

Student workstation, Autodesk Inventor Professional 2018, 3D Printer

PROJECT BRIEF: Students will utilize Industry-Standard Software tools to learn, practice, master, and apply modeling fundamentals in two and three dimensions.

- T will model 3D modeling design fundamentals for Ss.
- Ss will practice refining individual skills by completing various modeling challenges. Ss will practice skills related to modeling…
  - Extrusion
  - Scaling
  - Chamfer
  - Fillets
  - Constructing Holes
  - Dimensional Constraints
  - Spatial Constraints

Additional Standards Addressed: 10.B, 10.C, 10.D, 10.E, 10.F

ASSESSMENT:

T: Direct observation; observation checklist.

S: Completed modeling assignments submitted to teacher for review.

S: Engineering notebook reflection and documentation.

INSTRUCTIONAL STRATEGIES:

Blended Learning, Self-Paced PBL, Technology, Direct Modeling

DIFFERENTIATED INSTRUCTION SUPPORT:

Provide accommodations to students in accordance with IEP.

Instructional aides (videos, graphic organizers, etc.) provided for ELL students.