

Publications

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## Integrating Virtual Reality into the Asynchronous Learning Environment

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# Integrating Virtual Reality into the Asynchronous Learning Environment

**Cheri Marcham  
Dave DC Delcastillo  
David Thirtyacre  
Brian Sanders**

# Overview

- 4 presentations
- Covers a spectrum of subject matter
  - Real to virtual and virtual to real
- Want to highlight
  - What the goal was
  - How it was integrated into effective learning experiences

VOSHE here

Maintenance here

A stylized, light-colored graphic of an eagle's head is positioned on the left side of the slide, facing right. The graphic is composed of smooth, flowing shapes in shades of yellow and white, set against a solid yellow background. The eagle's beak is prominent, and its feathers are suggested by curved lines.

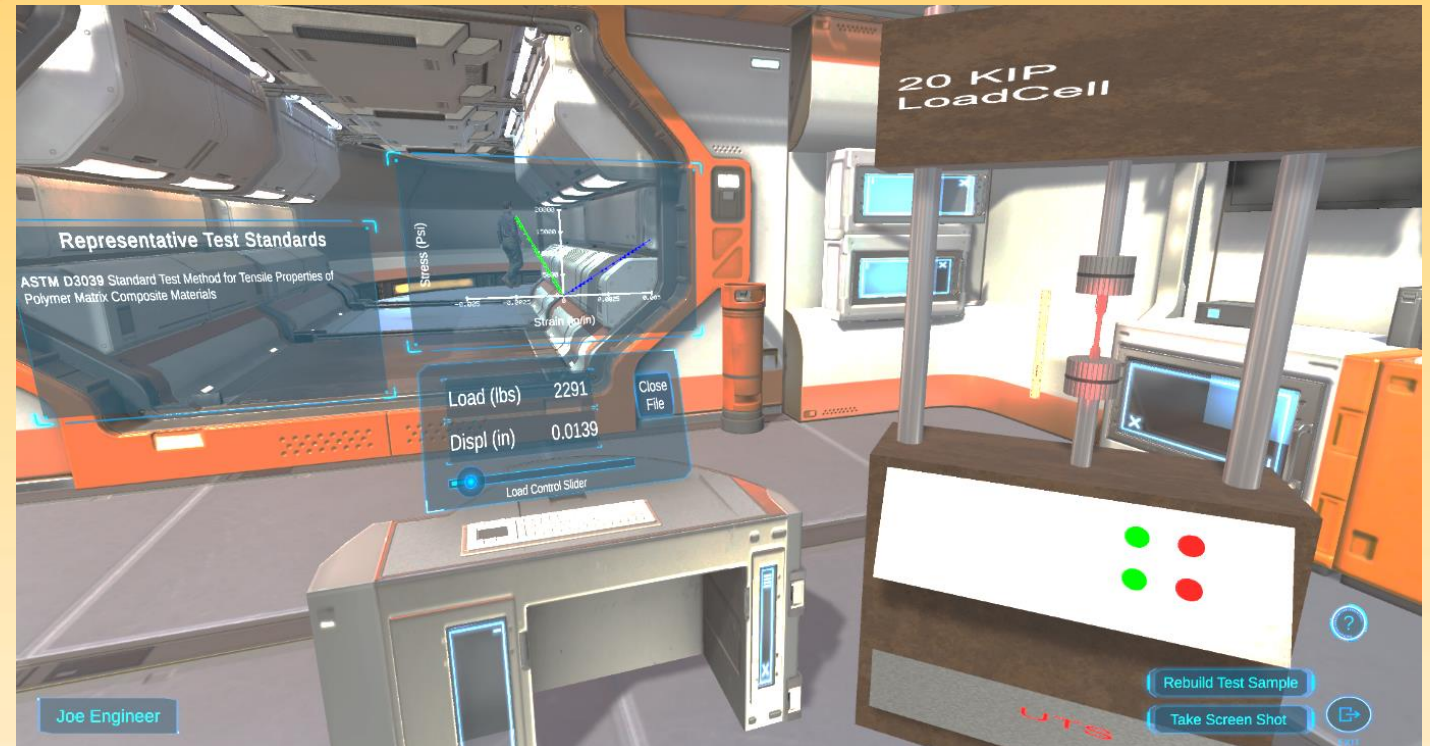
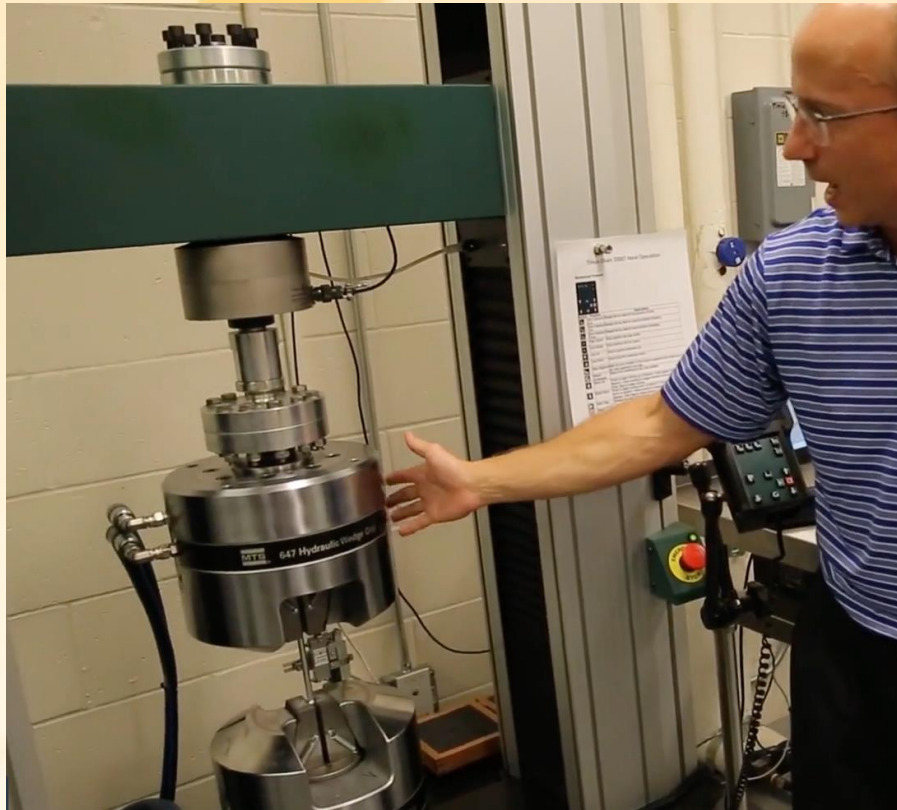
ERUPT here

# Virtual Composites Laboratory

*Dr. Brian Sanders*  
*Title:Bottom Feeder*  
*Embry-Riddle Aeronautical University*  
*Worldwide Campus*

# Virtual Composites Lab

- Engineering laboratory experience in the online environment
- Demonstrate in Real World - Explore in Virtual World
- Connected to ABET Student Outcomes



Real to Virtual



# Building a Composite Material

**Laminate Specimen Design**

Layer Number	Material	Thickness (in)	Orientation (Deg)
1	Boron-Epoxy	.025	0
2	Boron-Epoxy	.025	90
3	Boron-Epoxy	.025	90
4	Boron-Epoxy	.025	0

Sample Name: Test 1  
Length (in): 10  
Width (in): 4  
Thickness (in): .1  
Number of Layers: 4

Design Layers: Aluminum, Titanium, Boron-Epoxy, Glass Epoxy

Material Properties:  
Bending Stiffness (EI) (lb-in<sup>2</sup>): 8.83e+00  
I<sub>x</sub> (in<sup>4</sup>): 3.33e-00  
Weight (lbs): 0.39

Compute Laminate Properties  
Sample Selection Menu  
Tensile Test  
3 Point Bend Test  
Screen Shot  
Sally Student

- Students can personalize
- Easy to change setup parameters – keeps it authentic

**Tensile Test Sample Design Panel**  
Directional Material

Sample Name	# of Layers	Material	Orientation
<i>Enter Sample Name</i>	1	Boron-Epoxy	30

Cross Section Area (sq in) *0.125*

Gauge Length (in) *2*

Material Selection: Aluminum, Titanium, Boron-Epoxy, Glass Epoxy, Alien Composite

Results Panel:

Ex (Psi)	4.27e+006
Ey (Psi)	2.14e+006
Gxy (Psi)	1.51e+006
Nu_xy	0.40

Compute Non Principle Axis Properties

Sample Selection Menu

Process

Test

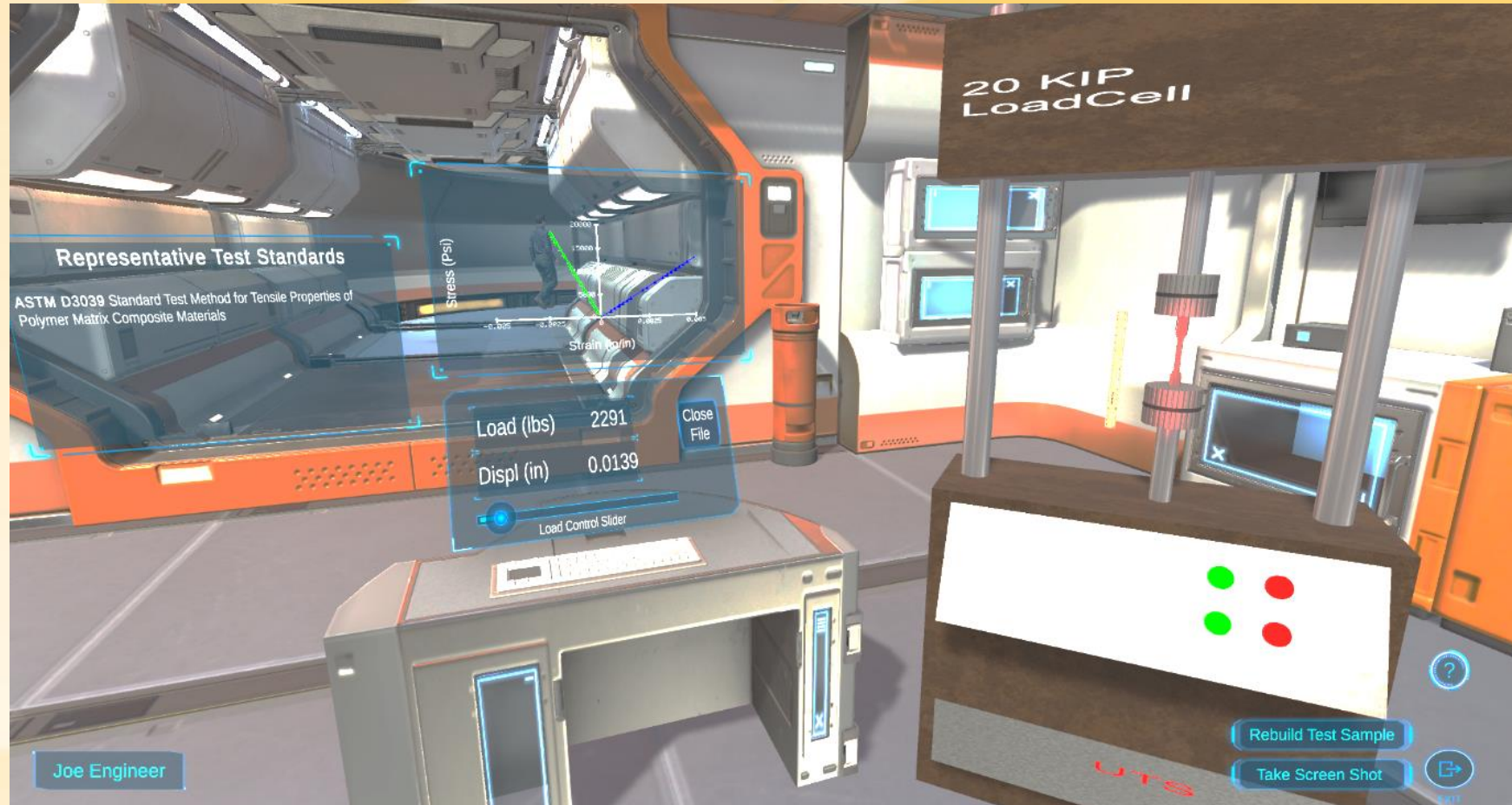
Screen Shot

Sally Student

# 3 Point Bend Test



# Tensile Test



ABET SO

- Collect data
- Analyze and interpret

# Summary of Advantages

- Enabling “hands on” training
- Skill development prior to real world application
- Personalization
- Original content