



MEDIA PRODUCTION: 3D MODELER

OD20605

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COMPETENCY-BASED EDUCATION: OKLAHOMA'S RECIPE FOR SUCCESS

By the Industry for the Industry

Oklahoma's *CareerTech* system of competency-based education uses industry professionals and certification standards to identify the knowledge and abilities needed to master an occupation. This industry input provides the foundation for development of instructional materials that help prepare the comprehensively trained, highly skilled employees demanded by our workplace partners.

Tools for Success

CareerTech relies on three basic instructional components to deliver competency-based instruction: skills standards, curriculum materials, and competency assessments.

Skills standards provide the foundation for competency-based instruction in Oklahoma's *CareerTech* system. The skills standards outline the knowledge, skills, and abilities needed to perform related jobs within an industry. Skills standards are aligned with national skills standards; therefore, a student trained to the skills standards possesses technical skills that make him/her employable in both state and national job markets.

Curriculum materials contain information and activities that teach students the knowledge and skills outlined in the skills standards. In addition to complementing classroom instruction, curriculum resources provide supplemental activities to enhance learning and provide hands-on training experiences.

Competency Assessments test the student over material outlined in the skills standards and taught using the curriculum materials. When used with classroom performance evaluations, written competency assessments provide a means of measuring occupational readiness.

Although each of these components satisfy a unique purpose in competency-based education, they work together to reinforce the skills and abilities students need to gain employment and succeed on the job.

MEASURING SUCCESS

Written competency assessments are used to evaluate student performance. Results reports communicate competency assessment scores to students and provide a breakdown of assessment results by duty area. The results breakdown shows how well the student has mastered skills needed to perform major job functions and identifies areas of job responsibility that may require additional instruction and/or training.

Group analysis of student results also provides feedback to instructors seeking to improve the effectiveness of career and technology training. Performance patterns in individual duties indicate opportunities to evaluate training methods and customize instruction.

TRUE TO OUR PURPOSE

"We prepare Oklahomans to succeed in the workplace, in education, and in life" defines the mission of Oklahoma *CareerTech* and its competency-based system of instruction. Skills standards, curriculum, and assessments that identify and reinforce industry expectations provide accountability for programs and assure *CareerTech's* continued role in preparing skilled workers for a global job market

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**MEDIA PRODUCTION
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SKILLS STANDARDS
Desired Skills Level Ratings**

Duty ES: Demonstrate Employability Skills

Desired Skill Level: The level of training necessary for the student to be employable in the occupation specified:

- 4 – Skilled Can perform the task independently with no additional training
- 3 – Moderately Skilled Has performed the task independently during training program; limited additional training may be required
- 2 – Limited Skill Has practiced task during training program; additional training is required to develop the skills
- 1 – No Exposure No experience or knowledge in this area

***DSL = Desired Skill Level**

DUTY ES: Demonstrate Employability Skills

CODE	TASK	DSL
ES.01	Demonstrate personal characteristics desired by employers <ul style="list-style-type: none"> • Detail-oriented • Good communication skills • Good attendance • Neat appearance • Honest/ethical • High self-esteem • Flexible • Goal-oriented • Commitment • Cooperative • Initiative • Responsible • Positive attitude • Self management • Drug free/alcohol free 	4
ES.02	Demonstrate effective interpersonal skills	4
ES.03	Demonstrate a positive attitude	4
ES.04	Demonstrate customer service skills	4
ES.05	Utilize proper telephone techniques	4
ES.06	Use job-related terminology, symbols, and abbreviations	4
ES.07	Interpret and follow oral and written directions	4

ES.08	Recognize the importance of team work and participate as a team member	4
ES.09	Use critical thinking skills in workplace situations	4
ES.10	Demonstrate negotiation skills	3
ES.11	Demonstrate leadership skills	2
ES.12	Understand organization structure and employee roles	3
ES.13	Develop and demonstrate public presentation skills	3
ES.14	Understand cultural diversity in the workplace	3
ES.15	Explore opportunities for advanced training	3
ES.16	Participate in computer literacy training, when applicable	4
ES.17	Perform self-evaluation to establish/modify career goals	3
ES.18	Identify employment opportunities	4
ES.19	Identify levels of training recommended for related careers	3
ES.20	Understand salary, wages, and benefits packages	4
ES.21	Complete an employment application	4
ES.22	Prepare a resume	4
ES.23	Complete an employment interview	4
ES.24	Complete a W-4 form	3
ES.25	Create an employment portfolio	3
	Safety	
ES.26	Explain the purpose for safety policies	4
ES.27	Participate in safety training <ul style="list-style-type: none"> • Locate information in MSDS • Office safety • Ergonomics • Blood born pathogens • Describe the types of fire hazards found in the workplace • Discuss electrical hazards • Demonstrate safe material handling techniques <ul style="list-style-type: none"> • Lifting • Transporting • Storing • Understand established first aid procedures • Practice good housekeeping • Comply with company safety policies 	4
ES.28	Explain the proper steps in reporting an accident or emergency	4
ES.29	Explain the hazards associated with specific types of equipment and tools	4
	Academic Skills	4
ES.30	Apply reading and writing skills	4
ES.31	Apply mathematical operations involving whole numbers, fractions, decimals, percentages, mathematical word problems, formulas, ratios, etc., when necessary	4
ES.32	Interpret charts, tables, and graphs	3
	Problem Solving	

ES.33	Utilize problem solving and critical thinking techniques to identify and solve problems <ul style="list-style-type: none"> Brainstorming 	4
ES.34	Discuss data collection techniques for the problem solving process	3
ES.35	Identify opportunities for applying problem solving skills	3
	Technology Skills	
ES.36	Demonstrate knowledge of basic computer concepts	4
ES.37	Demonstrate basic computer skills <ul style="list-style-type: none"> Word processing skills Email Accounting software Spreadsheet applications Database administration (as needed) Presentation software Internet research 	4

**MEDIA PRODUCTION
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SKILLS STANDARDS
Frequency and Criticality Ratings**

Duty A: Planning

Duty B: Managing

Duty C: Ethics

Duty D: Production Standards

Duty E: Modeling Techniques

Duty F: Modifiers

Duty G: Surface Texture Techniques

Duty H: Scene Composition

Duty I: Evaluation

Frequency: represents how often the task is performed on the job. Frequency rating scales vary for different occupations. The rating scale used in this publication is presented below:

- 1 = less than once a week
- 2 = at least once a week
- 3 = once or more a day

Criticality: denotes the level of consequence associated with performing a task incorrectly. The rating scale used in this publication is presented below:

- 1 = slight
- 2 = moderate
- 3 = extreme

DUTY A: Planning

CODE	TASK	F/C
A.01	Demonstrate knowledge of planning considerations: <ul style="list-style-type: none"> • Target audience • Availability of hardware • Selection of appropriate graphics software • Selection of format • Delivery mode • Set schedule 	1/3
A.02	Study character sketches and storyboards to identify areas that can't be reproduced	1/3
A.03	Confer with production team concerning constraints and limitations <ul style="list-style-type: none"> • Environment • Character • Scope of animation – how it will deform 	1/3

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	<ul style="list-style-type: none"> • Output (film, game, print) • Triangles or quads • Poly count limit 	
A.04	Exhibit knowledge of the critical elements in designing a production in the stages of pre-production, production, and postproduction <ul style="list-style-type: none"> • Identify areas of artwork that are missing and need to be designed. • Identify unique characteristics of a model. • Identify differences if creating a family of similar models. • Plan development of models. • Identify the appropriate graphics tools needed to complete production. • Identify the linkage from each stage to the next in processes and activities. 	1/3

DUTY B: Managing

CODE	TASK	F/C
B.01	Gather concept art, assets, character sketches, environment sketches, and storyboard/animatic information	2/2
B.02	Use time management to produce models according to the production schedule	3/3
B.03	Conform to the appropriate naming scheme/conventions <ul style="list-style-type: none"> • Project • File 	3/3
B.04	Scene management	2/3

DUTY C: Ethics

CODE	TASK	F/C
C.01	Organize and maintain compliance, license, and warranty information related to the project	1/1
C.02	Demonstrate knowledge of copyright and intellectual property protection issues	3/3
C.03	Demonstrate knowledge of legal issues: copyright issues (use, fair use, and protection)	3/3

DUTY D: Production Standards

CODE	TASK	F/C
D.01	Determine model requirements for story <ul style="list-style-type: none"> • Complexity details • Relationship between models <ul style="list-style-type: none"> ○ Size ○ Weight • Hair/fur • Blendshape requirements • Integrated clothing and accessories 	1/2
D.02	Determine model media format and delivery output <ul style="list-style-type: none"> • Export settings (obj & FBX) • Import settings • Knowledge of how to activate 3rd party plug-ins 	1/3

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D.03	Understand how to prepare geometry for sculpting	1/2
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DUTY E: Modeling Techniques

CODE	TASK	
E.01	Demonstrate creation of polygon models <ul style="list-style-type: none"> • Create primitive shapes • Extrude surfaces to build complex shapes • Bridge surfaces • Vertex, edge, and face manipulation • Mirror geometry • Merge border edges • Add divisions and edge loops • Combine, separate, extract geometry • Boolean operations to combine geometry • Chamfer, bevel and crease • Smooth vertices • Reduction of geometry 	3/3
E.02	Demonstrate creation of subdivision surface models <ul style="list-style-type: none"> • Create primitive shapes • Understand polygon proxy modes • Set component display level • Vertex, edge, and face manipulation • Extrude geometry • Crease edge/vertex • Mirror/merge geometry 	1/2
E.03	Demonstrate creation of NURBS models <ul style="list-style-type: none"> • Create primitives • Create surfaces from curves <ul style="list-style-type: none"> ○ Loft ○ Planar ○ Revolve ○ Birail • Project a curve on a surface • Hulls, surface point, control vertex, isoparm manipulation • Modify curves, length, bend, curl, scale curvature • Trim surfaces • Attach, detach, align, open/close curves and surfaces • Reverse surface direction • Rebuild surfaces • Rebuild curves 	1/2
E.04	Convert to and from polygon, subdivision, and NURBS.	3/3
E.05	Understand normals and their role	1/2
E.06	Topology <ul style="list-style-type: none"> • Ngons • Triangles • Quads • Poles 	2/2

DUTY F: Modifiers

CODE	TASK	
F.01	Deformation <ul style="list-style-type: none"> • Lattice • Bulge • Twist • Bend • Sculpt geometry 	2/2
F.02	Animation <ul style="list-style-type: none"> • Create Blendshapes as required for the animation • Soft modification/soft selection 	2/2

DUTY G: Surface Texture Techniques

CODE	TASK	
G.01	Apply surface material to model	1/2
G.02	Apply texture to model	1/3
G.03	Understanding UV's <ul style="list-style-type: none"> • UV layout • Unwrapping UV's • Manipulating UV's 	1/3
G.04	Create and assign textures to polygons <ul style="list-style-type: none"> • Create a Diffuse Map • Save UV snapshot • Edit texture maps <ul style="list-style-type: none"> ○ Modify the Diffuse Map ○ Add wear and tear details using ambient occlusion ○ Modify the Diffuse Map ○ Create a Specular Map from the Diffuse Map ○ Create a Bump Map • Assign your maps to the shader 	1/3
G.05	Materials <ul style="list-style-type: none"> • Place secondary textures as required • Understand differences in materials 	1/2
G.06	Mental Ray <ul style="list-style-type: none"> • Create an Ambient Occlusion Map • Creating and applying displacement maps • Baking textures 	1/2

DUTY H: Scene Composition

CODE	TASK	F/C
H.01	Scene layout and dressing	1/2
H.02	Demonstrate lighting techniques for the project	1/1
H.03	Camera angles and techniques	1/1
H.04	Understand techniques for rendering a turntable view	1/2

DUTY I: Sculpting

CODE	TASK	
I.01	Determine if model needs sculpting based off the requirements	2/3
I.02	Prepare model for export into selected software	2/2
I.03	Demonstrate sculpting techniques: <ul style="list-style-type: none">• Symmetry / Asymmetry• Additive / Subtractive Sculpting• Creating / using alphas• Adding new pieces of geometry• Understanding differences of brushes• Moving and repositioning mesh	3/3
I.04	Polygon management based on hardware	1/3
I.05	Scene management of multiple pieces of geometry	2/2
I.06	Understanding topology flow and how to manipulate it	2/3
I.07	Export out of sculpting software to host application	2/3

DUTY J: Evaluation

CODE	TASK	
J.01	Critique and analyze completed project to determine if it accomplishes the objective of the project.	1/3