



**DRAFTING
DRAFTING TECHNCIAN
SKILLS STANDARDS
OD42701**

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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**DRAFTING
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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"> • 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	3
ES.03	Demonstrate a positive attitude	4
ES.04	Demonstrate customer service skills	3
ES.05	Demonstrate personal resource skills	3
ES.06	Utilize proper telephone techniques	2
ES.07	Use job-related terminology, symbols, and abbreviations	3
ES.08	Interpret and follow oral and written directions	4

ES.09	Recognize the importance of team work and participate as a team member	4
ES.10	Use critical thinking skills in workplace situations	4
ES.11	Demonstrate negotiation skills	3
ES.12	Demonstrate leadership skills	2
ES.13	Understand organization structure and employee roles	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	3
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	3
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	Discuss the role of OSHA and EPA <ul style="list-style-type: none"> • Locate information in MSDS 	4
ES.28	Participate in OSHA training <ul style="list-style-type: none"> • Lock Out/Tag Out • HAZCOM <ul style="list-style-type: none"> • MSDS • Blood Born Pathogens 	4
ES.29	Explain the proper steps in reporting an accident or emergency	4
ES.30	Explain the hazards associated with specific types of equipment and tools	4
ES.31	Perform machine operator safety checks of equipment and accessories, when necessary	4
ES.32	Practice tool safety	4
ES.33	Demonstrate and use appropriate tools for the job	4
ES.34	Describe the types of fire hazards found in the workplace	4
ES.35	Discuss electrical hazards	3
ES.36	Demonstrate safe use of personal protective equipment	4
ES.37	Demonstrate safe material handling techniques <ul style="list-style-type: none"> • Lifting • Transporting • Storing 	4
ES.38	Understand established first aid procedures	4
ES.39	Practice good housekeeping	4
ES.40	Comply with company safety policies	4

	Academic Skills	4
ES.41	Apply reading and writing skills, when necessary	4
ES.42	Apply mathematical operations involving whole numbers, fractions, decimals, percentages, mathematical word problems, formulas, ratios, etc., when necessary <ul style="list-style-type: none"> • Addition • Subtraction • Multiplication • Division 	4
ES.43	Apply advanced mathematical operations, when necessary <ul style="list-style-type: none"> • Algebra • Geometry • Trigonometry 	3
ES.44	Apply scientific principles, when necessary <ul style="list-style-type: none"> • Physics • Chemistry 	2
ES.45	Interpret charts, table, and graphs	3
	Quality Assurance & Problem Solving	
ES.46	Understand the principles of quality assurance	3
ES.47	Participate in the implementation of quality assurance programs <ul style="list-style-type: none"> • Material and Labor Utilization 	3
ES.48	Identify the effects of continuous quality improvement	3
ES.49	Utilize problem solving and critical thinking techniques to identify and solve problems <ul style="list-style-type: none"> • Brainstorming 	4
ES.50	Discuss data collection techniques for the quality assurance and problem solving process	3
ES.51	Identify opportunities for applying problem solving skills	3
	Blueprints	
ES.52	Identify basic elements of blueprints <ul style="list-style-type: none"> • Terms • Components <ul style="list-style-type: none"> • Revisions • Symbols 	4
ES.53	Discuss different types of drawings	3
ES.54	Interpret drawings <ul style="list-style-type: none"> • Bill of Materials • Revisions • Tolerances • Document system changes • Modify prints 	4
ES.55	Interpret symbols	4
	Measurement Tools & Techniques	
ES.56	Identify types of measuring instruments	4
ES.57	Use appropriate measurement instrument for a measurement task	4

ES.58	Read measuring instruments	4
ES.59	Identify the appropriate formula and units for a measurement task	3
ES.60	Differentiate between English and Metric measurement systems, when necessary	3
ES.61	Communicate measurements using proper symbols or words	4
ES.62	Demonstrate the importance of calibration	3

**DRAFTING
DRAFTING TECHNICIAN
SKILLS STANDARDS
Frequency and Criticality Ratings**

Duty A: Use and Maintain Basic Drafting Equipment

Duty B: Demonstrate Correct Lettering and Sketching Techniques

Duty C: Solve Mathematical Problems Related to Drafting

Duty D: Using a CAD System

Duty E: Utilize Basic Geometric Construction

Duty F: Utilize Hardcopy Reproduction Processes

Duty G: Prepare Multiview Drawings

Duty H: Prepare Section Views

Duty I: Prepare Auxiliary Views

Duty J: Apply Basic Annotation to a Drawing

Duty K: Prepare Pictorial/Solid Model Drawings

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: Use and Maintain Basic Drafting Equipment

CODE	TASK	F/C
A.01	Identify and use drafting references, handbooks, vendor's product catalog, and related appropriate industrial standards where required	3/3
A.02	Select drafting final product <ul style="list-style-type: none"> • Media • Reproduction requirements 	3/3
A.03	Draw the alphabet of lines	3/3
A.04	Use and maintain drawing equipment	3/3
A.05	Use metric scale	3/3
A.06	Use architect's scale	3/3
A.07	Use civil engineer's scale	3/3
A.08	Use mechanical engineer's scale	3/3

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DUTY B: Demonstrate Correct Lettering/Sketching Techniques

CODE	TASK	F/C
B.01	Identify and use appropriate industrial standards	3/3
B.02	Add text to a drawing	3/3
B.03	Perform free-hand lettering	3/3
B.04	Use sketching techniques	3/3

DUTY C: Solve Mathematical Problems Related to Drafting

CODE	TASK	F/C
C.01	Use conversion tables and formulas from reference books	2/3
C.02	Utilize appropriate reference handbooks <ul style="list-style-type: none"> • Calculate area of objects • Calculate volumes • Calculate weights of objects • Calculate lengths of objects 	2/3
C.03	Solve basic mathematical problems using geometry	3/3
C.04	Solve basic mathematical problems using algebra	2/3
C.05	Solve basic mathematical problems using trigonometry	1/2

DUTY D: Using a CAD System

CODE	TASK	F/C
D.01	Use operating systems <ul style="list-style-type: none"> • Maintain file system • Utilities • Internet/Intranet • Storage device 	3/3
D.02	Identify hardware of a CAD workstation	3/3
D.03	Execute application software for CAD	3/3
D.04	Configure CAD workstation	1/2
D.05	Utilize various coordinate systems	3/3
D.06	Manipulate CAD drawings <ul style="list-style-type: none"> • Create • Modify • Retrieve 	3/3
D.07	Customize application software	1/1
D.08	Convert an existing hard copy drawing to an electronic format <ul style="list-style-type: none"> • Scanner • Raster/vector 	1/1
D.09	Utilize drawing management standards <ul style="list-style-type: none"> • Drawing naming conventions • Predefined drawing setup • Object management • Line types 	3/3

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	<ul style="list-style-type: none"> • CAD system variables • Fonts 	
D.10	Develop symbols, text based information, and libraries	3/3
D.11	Develop basic 3D drawings	2/2
D.12	Set up plot parameters	3/3
D.13	Integrate other software with CAD applications	2/2
D.14	Import/export drawings from/to various graphic formats	1/2

DUTY E: Utilize Basic Geometric Construction

CODE	TASK	F/C
E.01	Bisect lines, arcs, and angles	3/3
E.02	Prepare angles	3/3
E.03	Prepare perpendicular and parallel lines	3/3
E.04	Prepare geometric shapes	3/3
E.05	Prepare drawings of tangent lines and arcs	3/3
E.06	Prepare drawings of ellipses	3/3
E.07	Prepare involutes	1/2

DUTY F: Utilize Hardcopy Reproduction Processes

CODE	TASK	F/C
F.01	Operate copy machines	1/1
F.02	Operate printers, plotters, and scanners	3/3

DUTY G: Prepare Multiview Drawings

CODE	TASK	F/C
G.01	Select proper views	3/3
G.02	Determine and utilize line precedence	3/3
G.03	Prepare freehand orthographic sketches	3/3
G.04	Prepare orthographic projection drawings	3/3

DUTY H: Prepare Section Views

CODE	TASK	F/C
H.01	Identify and select proper section views	3/3
H.02	Draw sections to current ANSI standards	3/3

DUTY I: Prepare Auxiliary Views

CODE	TASK	F/C
I.01	Select proper auxiliary plane <ul style="list-style-type: none"> • Inclined and oblique surfaces 	1/1
I.02	Draw auxiliary views	1/2

DUTY J: Apply Basic Annotation to a Drawing

CODE	TASK	F/C
J.01	Draw dimension and extension lines	3/3
J.02	Apply adequate drawing notations	3/3
J.03	Apply dimensions and tolerances to appropriate drawings	3/3
J.04	Use appropriate abbreviations	3/3
J.05	Apply finish marks <ul style="list-style-type: none">• Appropriate disciplines	3/3

DUTY K: Prepare Pictorial/Solid Model Drawings

CODE	TASK	F/C
K.01	Prepare freehand pictorial sketches	1/3
K.02	Prepare axonometric drawings <ul style="list-style-type: none">• Isometric• Dimetric• Trimetric	1/2
K.03	Prepare oblique drawings	1/2