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Goodheart-Willcox Correlation of *Engineering Fundamentals: Design, Principles, and Careers* ©2018 to Oklahoma Standards for Career Tech / Computer Education Course: Principles of Engineering – Grades 9-12

Standard	Correlating Textbook Pages
Demonstrating Personal Qualities and Abilities	
Demonstrate creativity and innovation.	4, 7-8, 24-26
Demonstrate critical thinking and problem solving.	4-5, 7-8, 24-26
Demonstrate initiative and self-direction.	24-26
Demonstrate integrity.	24-26
Demonstrate work ethic.	24-26
Demonstrating Interpersonal Skills	
Demonstrate conflict-resolution skills.	4-5, 7-8, 24-26
Demonstrate listening and speaking skills.	24-26
Demonstrate respect for diversity.	24-26
Demonstrate customer service skills.	24-26
Collaborate with team members.	24-26
Demonstrating Professional Competencies	
Demonstrate big-picture thinking.	45-48
Demonstrate career- and life-management skills.	7-8
Demonstrate continuous learning and adaptability.	7-8, 27
Manage time and resources.	7-8
Demonstrate information-literacy skills.	7-8
Demonstrate an understanding of information security.	7-8
Maintain working knowledge of current information-technology (IT) systems.	7, 11, 13, 48, 50, 123, 251-269
Demonstrate proficiency with technologies, tools, and machines common to a specific occupation.	7, 11, 13, 48, 50, 123, 251-269
Apply mathematical skills to job-specific tasks.	6, 116-19, 259
Demonstrate professionalism.	7-8
Demonstrate reading and writing skills.	7-8
Demonstrate workplace safety.	42, 129, 214, 342 - 344, 387
Examining All Aspects of an Industry	
Examine aspects of planning within an industry/organization.	7-8
Examine aspects of management within an industry/organization.	7-8, 26
Examine aspects of financial responsibility within an industry/organization.	32

Examine technical and production skills required of workers within an industry/organization.	7-8, 26
Examine principles of technology that underlie an industry/organization.	7, 11, 13, 48, 50, 123, 251-269
Examine labor issues related to an industry/organization.	7-8, 24-26
Examine community issues related to an industry/organization.	4-5, 24-26
Examine health, safety, and environmental issues related to an industry/organization.	32, 42, 129 - 130, 342 - 344, 376, 380
Addressing Elements of Student Life	
Identify the purposes and goals of the student organization.	194-195
Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.	3
Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.	194-195
Identify Internet safety issues and procedures for complying with acceptable use standards.	35
Exploring Work-Based Learning	
Identify the types of work-based learning (WBL) opportunities.	27
Reflect on lessons learned during the WBL experience.	27
Explore career opportunities related to the WBL experience.	27
Participate in a WBL experience, when appropriate.	27
Examining How Technology Affects Our World	
Explain the influence of technological systems.	7
Describe the characteristics and scope of technology.	7
Identify the core concepts of technology.	7
Identify historical technology milestones and advancements.	7
Examine technological systems.	7
Investigating How Engineering Affects Our World	
Define engineering.	4
Summarize the history of engineering.	16-19
Research an engineering achievement.	16-19

Present information pertaining to an engineering achievement.	16-19
Examining the Engineering Practice	
Describe the principal fields for specialization in engineering.	10-16
Summarize the traits of successful professional engineers.	7-8
Describe the education needed for specialty fields in engineering and technology.	27
Explain the importance of communication between engineers and their clients.	7-8
Explain the relevance of the National Society of Professional Engineers Code of Ethics.	29
Comply with safety rules in laboratory activities.	42, 129, 154, 214, 387
Practicing Engineering Fundamentals	
Identify the benefits of case study analysis.	4 - 5
Analyze a case study analysis.	4 - 5
Apply measuring skills using instrumentation.	117, 204
Demonstrate conversion techniques for units of measurement.	117, 204
Demonstrate the use of engineering design graphics and descriptive geometry.	47-48, 98 -101, 111
Apply the techniques and benefits of sketching.	46, 78-83
Draw orthographic and isometric projections, using basic technical drawing instruments.	102-105
Explain rapid prototyping to develop models.	49
Demonstrate research techniques/strategies used by engineers.	68, 77 - 93
Define risk and safety.	35, 42, 214
Describe the three types of accidents.	42, 214
Identify major precursors of accidents.	42, 214
Evaluate the safety of designs.	42, 214
Demonstrate knowledge of appropriate personal safety procedures.	42, 429, 214, 342-344, 387
Examining the Engineering Design Process	
Define an engineering design process.	42-54
Define an engineering design problem.	43-45
Identify the requirements and constraints of the design problem.	43-45
Research potential solutions to the design problem.	47-48
Generate multiple solutions to the design problem.	47-48

Sketch the solutions to a design problem.	47-48
Evaluate the requirements and constraints of each potential solution to the design problem.	48-50
Justify an optimal solution to the design problem.	50-52
Create a model or prototype for the chosen solution.	50-52
Test the solution to the design problem.	50-52
Evaluate the test results.	50-52
Modify the solution to the design problem, if needed.	52
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Present the final project report.	52
Identifying Real-world Problems	
Research local problems that could benefit from engineering solutions.	45-48
Design an engineering solution to a local problem, using the engineering design process.	45-48