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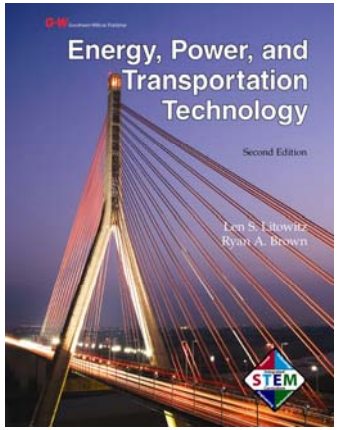
GEORGIA DEPARTMENT OF EDUCATION
2011 LEARNING RESOURCES RECOMMENDATION PROCESS
GRADES 6-12 CAREER, TECHNICAL AND AGRICULTURAL EDUCATION (CTAE)

INSTRUCTIONAL MATERIAL CORRELATION

Course: Energy and Power Technology (21.45100)

Text: *Energy, Power, and Transportation Technology* ©2012



FORMAT FOR CORRELATION TO THE GEORGIA PERFORMANCE STANDARDS

Subject Area: Career, Technical & Agricultural Education **State-Funded Course:** 21.45100 Energy and Power Technology

Textbook Title: ***Energy, Power, and Transportation Technology***

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The Georgia Performance Standards for Grades 6-12 Career, Technical and Agricultural Education (CTAE) may be accessed on-line at: http://www.georgiastandards.org/.

Standard (Cite Number)	**Standard** (Cite specific standard)	**Where Taught** (If print component, cite page number; if non-print, cite appropriate location.)
ENGR-EP-1	**Students will utilize the ideas of energy, work, power, and force to explain how systems convert, control, transmit, and/or store energy and power.**	
a.	Describe processes by which energy stored in a system may be used to do work.	40–50, 75–92, 97–117, 121–138
b.	Use Newton's Laws to calculate the net force acting or exerted by a system.	535, 573
c.	Determine the amount of work done by or on a system.	144–156
d.	Outline the difference between energy and power.	24–28
e.	Give examples of how conduction, convection, and radiation are considered in the selection of materials for buildings and in the design of a heating system.	126, 133
ENGR-EP-2	**Students explain how simple machines are used to do work.**	
a.	Calculate the mechanical advantage for different types of simple machines.	217–223
b.	Show through calculation or build models how simple machines affect the amount of work necessary to complete a task.	201–223
c.	Compare and contrast the ideal and actual mechanical advantage for different types of	217–233

	simple machines and explain the impact of these differences in the design of machine.	
d.	Determine the relationship of force and speed when either is changed by the advantage of a mechanical device.	217–22
ENGR-EP-3	**Students will differentiate between fluid power systems and apply the laws that govern each.**	
a.	Explain the difference between open fluid systems (e.g., irrigation, forced hot air system, air compressors) and closed fluid systems (e.g., force hot water system, hydraulic brakes).	
b.	Explain what is meant by fluid power.	227–228
c.	Compare and contrast how the volume of a gas varies with the changes in pressure and temperature.	242–243
d.	Describe how a fluid is able to transfer force as well as change the relationship between force and distance or speed.	230–232
e.	Calculate the ability of a hydraulic system to multiply distance, force and effect directional change.	242–243
f.	Solve mathematical problems involving changes in pressure, temperature, and volume in fluid power systems.	248–250
ENGR-EP-4	**Students will differentiate between AC and DC circuits and apply Ohm's and**	

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	Kirchoff's Laws.	
a.	Compare and contrast the characteristics of alternating current and direct current and the implications of the use of each form on work and power.	165–166
b.	Explain differences between series and parallel circuits.	174–177
c.	Explain the relationship of voltage, current, and resistance.	168–170
d.	Use Ohm's and Kirchoff's laws to calculate the rate at which work is being done by an electric component in a DC circuit.	168–170, 175–177
ENGR-EP-5	**Students will describe the basic components of a small engine and explain the difference between a 4-stroke and 2-stroke engine.**	
a.	Compare and contrast the advantages and disadvantages of the two and four cycle engines.	323–236
b.	Explain the concept of valve timing.	331–332
c.	Compare the lubrication system in a four-cycle engine to the system of a two-cycle engine.	323–326, 328–330
d.	Describe the two-stroke engine operation and explain the principles of two-cycle operation.	325–326
e.	Disassemble and reassemble a basic small engine.	342