



Emerging Technologies in Transportation and Logistics

Course Description

Emerging Technologies in Transportation and Logistics is a course that will introduce students to the application of technologies in the transportation and logistics industries. These areas will include: trucking Industry, railroad Industry, aviation Industry, shipping Industry, and various current and emerging transportation and logistics technologies.

Course Code: 101601

Program(s) of Study to which This Course Applies

- Logistics Planning and Management

Course Framework	Reference Standards	Academic Crosswalk to Common Core Standards	Academic Crosswalk to Nebraska Standards	Comments
Standard 1. Students will explain the different segments of the transportation industry.	KS - TRBP01.01.02	N/A	N/A	
Benchmark 1.1 Students will understand the functions of the trucking industry. <u>Sample performance indicators:</u> <ul style="list-style-type: none"> • Identify and explain the different laws and regulation associated with trucking. • Explain and demonstrate the proper use of trailer tandems. • Explain the different types of cargo a truck can carry. 	KS - TRBP01.01.02	N/A	N/A	
Benchmark 1.2 Students will understand the functions of the railroad industry. <u>Sample performance indicators:</u> <ul style="list-style-type: none"> • Identify and explain the different laws and regulations associated with 	KS - TRBP01.01.02	N/A	N/A	



<p>the railroad industry.</p> <ul style="list-style-type: none"> • Explain what a classification yard is. • Explain how different products are shipped by rail. 				
<p>Benchmark 1.3 Students will understand the functions of the Airline industry.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Identify and explain the different laws and regulations associated with the airline industry. • Explain what the lift principle is. • Explain the basic controls of an airplane. 	KS - TRBP01.01.02	N/A	N/A	
<p>Benchmark 1.4 Students will understand the functions of the Shipping and Marine Transport Industry.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain what an “intermodal” container is. • Identify the major ports in the United States and across the world. 	KS - TRBP01.01.02	N/A	N/A	
<p>Benchmark 1.5 Students will understand the functions of the oil industry</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain what a commodity is. • Explain what OPEC is and how it functions. • Explain what the Strategic Petroleum Reserve is. 	KS - TRBP01.01.02	N/A	N/A	
<p>Standard 2. Students will explain the current transportation technologies.</p>	KS - TRPD01.02.02 EPTT			
<p>Benchmark 2.1 Students will understand the theory of the four-stroke internal combustion engine.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain the four-strokes of a combustion engine. • Identify different types of engines. • Compare and Contrast carburetors and fuel injection systems. 	KS -TRPD01.02.02 EPTT	N/A	SC.12.2.1.e	Alignment presumes that students will identify the factors affecting the reaction rates of the chemicals involved in the cycling of four-stroke internal combustion engines (NE: SC.12.2.1.e).
<p>Benchmark 2.2 Students will understand the theory of the diesel engine.</p> <p><u>Sample performance indicators:</u></p>	KS - TRPD01.02.02 EPTT	N/A	SC.12.2.1.e	Alignment presumes that students will identify the factors affecting the reaction rates of the chemicals involved in the



<ul style="list-style-type: none"> • Explain what a glow plug does. • Explain what happens when diesel “gels”. 				cycling of diesel engines (NE: SC.12.2.1.e).
<p>Benchmark 2.3 Students will understand the theory of a two-stroke internal combustion engine.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain the two strokes of two-stroke combustion engine. • Explain the different uses of a two-stroke combustion engine 	KS -TRPD01.02.02 EPTT	N/A	SC.12.2.1.e	Alignment presumes that students will identify the factors affecting the reaction rates of the chemicals involved in the cycling of two-stroke internal combustion engines (NE: SC.12.2.1.e).
<p>Benchmark 2.4 Students will understand the theory of optional propulsion designs.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain how a rotary engine works. • Explain the how a diesel-electric locomotive works. • Explain how a jet engine works. • Explain how a hybrid engine. 	KS - TRPD01.02.02 EPTT	N/A	SC.12.2.2.a SC.12.2.3.j SC.12.2.3.k SC.12.2.1.e	Alignment presumes that students will explain the motion of engines and types of energy used as it relates to acceleration (NE: SC.12.2.2.a), and will identify the factors affecting the reaction rates of the chemicals involved in the cycling of optional propulsion engines (NE: SC.12.2.1.e).
<p>Standard 3. Students will explain emerging transportation energies and technologies.</p>	EPTT			
<p>Benchmark 3.1 Students will understand the uses and functions of bio fuels.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain how ethanol is made. • Explain how soy bio diesel is made. • Explain how bio-diesel influences the transportation industry. 	EPTT	N/A	SC.12.4.3.c	Alignment presumes that students will explain the use of renewable and nonrenewable energy sources (NE: SC.12.4.3.c).
<p>Benchmark 3.2 Students will understand the uses and functions of electric power.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain how a motor works. • Explain how electricity is distributed on the grid. • Explain how electricity is produced. 	EPTT	N/A	SC.12.2.3.f	Alignment presumes that students will explain electrical energy needed to run motors (NE: SC.12.2.3.f).



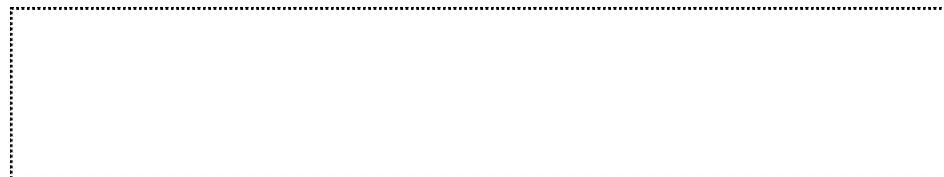
<p>Benchmark 3.3 Students will understand the uses and functions of hydrogen.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain how hydrogen vehicle works. • Explain how hydrogen is produced. 	EPTT	N/A	SC.12.4.3.c	
<p>Benchmark 3.4 Students will understand the uses and functions of natural gas.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain how a natural gas vehicles work. • Explain how natural gas is produced. 	EPTT	N/A	SC.12.4.3.c	
<p>Benchmark 3.5 Students will understand the uses and functions of other alternative energy sources.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain how propane is used in transportation. • Explain how nuclear energy is used to produce electricity. 	EPTT	N/A	SC.12.4.3.c	
<p>Standard 4. Students will explain current and emerging logistics technologies.</p>	KS - BAPE04.01.01 KS - BAPE04.01.02			
<p>Benchmark 4.1 Students will understand the uses and functions of bar codes in logistics.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain UPC codes. • Demonstrate the operation of Bar Code readers. 	KS - BAPE04.01.01 KS - BAPE04.01.02	N/A	SC.12.2.3.c	Alignment presumes that students will recognize light as a wave used to read bar codes (NE: SC.12.2.3.c).
<p>Benchmark 4.2 Students will understand the uses and functions of Radio Frequency Identification (RFID) in logistics.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain the 4 different parts to an RFID system. • Explain how a RFID system can increase visibility in a warehouse. • Explain how RFID can increase efficiency in a perpetual inventory system. 	KS - BAPE04.01.01 KS - BAPE04.01.02	N/A	SC.12.2.3.c	Alignment presumes that students will recognize light as a wave used to read bar codes (NE: SC.12.2.3.c).



<p>Benchmark 4.3 Students will understand the uses and functions of Global Positioning Systems (GPS) in logistics.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain how triangulation works. • Explain how GPS increases visibility in the supply chain. 	<p>KS - BAPE04.01.01 KS - BAPE04.01.02</p>	<p>N/A</p>	<p>MA.12.2.2.a</p>	<p>Alignment presumes that students will use geometric figures (e.g., triangulation) when explaining GPS logistics (NE: MA.12.2.2.a).</p>
<p>Benchmark 4.4 Students will understand the uses and functions of Geographical Information Systems (GIS) in logistics.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explain how GIS works. • Explain how GIS can increase efficiency in transportation. 	<p>KS - BAPE04.01.01 KS - BAPE04.01.02</p>	<p>N/A</p>	<p>N/A</p>	
<p>Benchmark 4.5 Students will understand the uses and functions of alternative logistics technologies.</p> <p><u>Sample performance indicators:</u></p> <ul style="list-style-type: none"> • Explore new emerging logistics technologies. • Explain how radar works. 	<p>KS - BAPE04.01.01 KS - BAPE04.01.02</p>	<p>N/A</p>	<p>N/A</p>	

Reference Standards Sources

- KS = Career Clusters Knowledge and Skills Statements. Revised 2008. National Career and Technical Education Foundation, Silver Spring, MD. www.careerclusters.org.
- EPTT: Energy, Power, and Transportation Technology.



Other Information

Suggestions for innovative teaching and learning

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strategies:	
Related assessments:	<ul style="list-style-type: none">•
Extended learning opportunities:	<ul style="list-style-type: none">•