

Concepts of Distribution and Logistics Technology

PEIMS Code: N1303800

Abbreviation: DISTLOG

Grade Level(s): 10-12

Award of Credit: 1.0

State Approved Innovative Course

- Districts must have local board approval to implement innovative courses.
- In accordance with Texas Administrative Code (TAC) §74.27, school districts must provide instruction in all essential knowledge and skills identified in this innovative course.
- Innovative courses may only satisfy elective credit toward graduation requirements.
- Please refer to [TAC §74.13](#) for guidance on endorsements.

Course Description:

In *Concepts of Distribution and Logistics Technology*, students will gain knowledge and skills in safe application, design, and assessment of technologies used in the supply chain and logistics industries. The students will apply knowledge and skills in using standard and emerging technologies in the field of logistics. This course allows students to understand, apply, and simulate the new technologies of distribution and logistics. The *Concepts of Distribution and Logistics Technology* course will provide students with a broader basis for understanding the technology of managing, storing, shipping, and receiving different materials. These technologies will include data base tracking and delivering software, equipment, and services used in the field. The course will develop the students' knowledge of distribution, logistics, and the supply chain.

Essential Knowledge and Skills:

- (a) General Requirements. This course is recommended for students in grades 10 and 12. Students shall be awarded one credit for successful completion of the course.
- (b) Introduction.
 - (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Transportation, Distribution, and Logistics (TDL) Career Cluster focuses on careers in planning, management, and movement of people, materials, and goods by road, pipeline, air, rail and water and related professional support services such as transportation infrastructure planning and management, logistics services, mobile equipment and facility maintenance.

- (3) In Concepts of Distribution and Logistics Technology, students will gain knowledge and skills in safe application, design and assessment of technologies used in the supply chain and logistics industries. The students will apply knowledge and skills in using standard and emerging technologies in the field of logistics. This course allows students to understand, apply, and simulate the new technologies of distribution and logistics. The Concepts of Distribution and Logistics Technology course will provide students with a broader basis for understanding the technology of managing, storing, shipping, and receiving different materials. These technologies will include data base tracking and delivering software, equipment, and services used in the field. The course will develop the students' knowledge of distribution, logistics, and the supply chain.
 - (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
 - (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative example.
- (c) Knowledge and Skills.
- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) identify policies and procedures of distribution and logistics;
 - (B) research careers in distribution and logistics systems;
 - (C) identify all personal protection equipment required in the workplace;
 - (D) research certification opportunities;
 - (E) investigate response plans to emergency situations; and
 - (F) practice employers' expectations such as appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills.
 - (2) The student develops a professional portfolio in preparation to enter the workforce. The student is expected to:
 - (A) create a resume;
 - (B) explain what it means to maintain a positive social media account;
 - (C) write and present a 20-30 second elevator speech, including personal attributes and characteristics that employers look for in new hires;
 - (D) research industry-related websites and locate jobs postings online;
 - (E) apply for jobs online and using paper applications;
 - (F) prepare for an interview by researching an employer website, writing possible interview questions, and developing inquiries about the company;
 - (G) write and send a thank-you note or a video thank-you email; and
 - (H) identify and explain networking strategies and research networking opportunities such as professional organizations in the field.
 - (3) The student analyzes the structure of a typical supply chain flow including the distribution and logistics network. The student is expected to:

- (A) explain the flow of products/services from raw material to the customer;
 - (B) describe the flow of information and the importance of communication from customer to supplier and from supplier to customer;
 - (C) describe the flow of finances into the company from product sales as well as from the company to the customer in the form of returns;
 - (D) describe the flow of returns and how it differs from the flow of production; and
 - (E) identify the key components found in a distribution and logistics network.
- (4) The student researches and applies warehouse operational methods. The student is expected to:
- (A) research the pros and cons of the use of automated warehousing;
 - (B) describe the path of a product through a standard warehouse and an automated warehouse;
 - (C) research new ways to secure data used in the distribution and logistics network;
 - (D) prepare business forms used by suppliers to control routing in a distribution and logistics network; and
 - (E) develop a simple warehouse management system with spreadsheet and word processing software.
- (5) The student analyzes the functions of a supplier in distribution and logistics. The student is expected to:
- (A) differentiate between sourcing and strategic sourcing;
 - (B) explain the difference between traditional supplier relationship management and a strategic supplier alliance;
 - (C) research and explain the concept of Business to Business (B2B) commerce; and
 - (D) explain the concept of supplier co-location and research the benefits of co-locating with suppliers.
- (6) The student develops an understanding of the procurement process. The student is expected to:
- (A) explain the difference between procurement and purchasing;
 - (B) research the concept of Total Cost of Ownership (TCO) as it relates to procurement;
 - (C) evaluate the technologies that are used during the procurement process such as analysis software and the benefits that technology brings to procurement; and
 - (D) explain the six key objectives of the procurement process, including identifying customer needs, looking outside your market, prioritizing relationships, collecting and spending data, communicating what you are doing, and knowing your negotiating position.
- (7) The student researches and summarizes the manufacturing processes. The student is expected to:

- (A) analyze manufacturing layouts, including process layout, product layout, cellular layout, and fixed-position layout;
 - (B) compare the four manufacturing environments, including make-to-stock, make-to-order, assembly-to-order, and engineer-to-order;
 - (C) describe the concepts of just-in-time and lean manufacturing;
 - (D) analyze the pros and cons of production offshoring and outsourcing; and
 - (E) evaluate the benefits of technology in manufacturing.
- (8) The student evaluates product design. The student is expected to:
- (A) describe the benefits of collaborative product design versus traditional over-the-wall product design;
 - (B) describe the benefits achieved during the product design process;
 - (C) identify and explain the features of non-price-based product differentiation such as availability, durability, quality and reliability;
 - (D) explain the concept of reverse logistics and its benefits;
 - (E) explain the phases in the product lifecycle such as launch, growth, and maturity and identify the key features of each;
 - (F) research and explain the benefits that technology brings to product or service design; and
 - (G) identify the characteristics of a product and their relationship to customer value.
- (9) The student develops an inventory management system. The student is expected to:
- (A) explain how information can be used to replace physical inventory;
 - (B) define safety stock and safety lead time and explain how they can be used successfully;
 - (C) research the types of supply chain inventory, including cycle, safety stock, anticipation, and pipeline, and the use cases for each;
 - (D) explain the types of inventory costs, including capital, storage, risk, and service, and how those costs are calculated;
 - (E) explain the various inventory policies and controls such as stock keeping units, cycle counting, and alphabetical (ABC) inventory classification and explain how they are used; and
 - (F) develop and present an inventory management system for a company.
- (10) The student applies problem-solving and organizational skills to develop a transportation management system. The student is expected to:
- (A) research the pros and cons of the five primary modes of transportation such as rail, motor, air, water, and pipeline;
 - (B) explain what 'last mile deliveries' are and why consumers are part of the disruption which causes logistics companies to focus on improving the timeliness of direct-to-consumer deliveries;
 - (C) research and compare the types of motor carriers and their limitations;

- (D) compare third party logistics (3PLs) and fourth party logistics (4PLs);
 - (E) research the benefits of transportation management software systems;
 - (F) explain the benefits of technology for the transportation system; and
 - (G) research the benefits of a business partnering with a transportation company to move products from the manufacturing location to the store.
- (11) The student researches and analyzes the distribution network. The student is expected to:
- (A) describe the differences and primary uses of the warehouse classifications, including private, public, and contract;
 - (B) summarize the key warehouse processes, including receiving, put away, storage, picking, packing, and shipping as well as value-added warehousing;
 - (C) research and compare the various mechanized and automated systems for handling warehouse materials;
 - (D) analyze the benefits of technology in distribution including warehouse management systems;
 - (E) explain the concepts of cross-docking and break-bulk operations;
 - (F) explain the concept of inland ports and their importance to today's supply chains;
 - (G) discuss the five basic functions of packaging, including protection, containment, information, utility of use, promotion;
 - (H) explain the concept of free trade zones; and
 - (I) develop a distribution and logistics network for a chosen product.
- (12) The student investigates the customer's role in driving the requirements for distribution and logistics. The student is expected to:
- (A) explain the voice of the customer (VOC) procedure and how it can be used to increase sales and profitability;
 - (B) research and explain how customer needs drive market disruption;
 - (C) identify ways the wants and needs of customers can be discovered;
 - (D) explain how the customer relationship management strategy changes as customers move through the product life cycle;
 - (E) research and explain the benefits technology provides that enables logistics companies to meet customer requirements; and
 - (F) define customer satisfaction and the ways organizations ensure they meet customers' satisfaction.

Recommended Resources and Materials:

Material Handling Institute Website: Video Material

Material Handling Institute (n.d.) *Designing Robotics with the Workforce in Mind*

<https://videos.mhi.org/designing-robotics-with-the-workforce-in-mind>

Course Title

Material Handling Institute (n.d.) *The Emerging Risks of Blockchain Technology*

<https://videos.mhi.org/the-emerging-risks-of-blockchain-technology>

Material Handling Institute (n.d.) *Regulatory Challenges in Healthcare Logistics*

<https://videos.mhi.org/challenges-in-healthcare-logistics>

Material Handling Institute (n.d.) Your Guide to Overhead Lifting Solutions

<https://videos.mhi.org/your-guide-to-overhead-lifting-solutions>

Material Handling Institute: Printed Material

Material Handling Institute (n.d.) Material Handling Institute *Glossary*

<http://www.mhi.org/glossary?q=%22warehouse+management+system%22&pb=1&fq=&sort=score+desc>

Material Handling Institute (n.d.) Automated Storage and Retrieval Systems

<http://www.mhi.org/fundamentals/automated-storage?>

Material Handling Institute (n.d.) Fundamentals of Warehousing & Distribution

<http://www.mhi.org/cte/materials>

Recommended Course Activities:

- The student will develop a professional portfolio with a resume, understanding networking, and social media sites used for job searches and for candidate evaluation.
- The student will develop a presentation on how the lean system can improve a part of the distribution and logistics network.

Suggested methods for evaluating student outcomes:

- Classroom Observation
- Daily Q&A
- Daily Quizzes using Kahoot! or Turning Point
- Rubric on different activities
- Poster of some form of technology used in Distributions and Logistics
- Earn the Certified Logistics Associate Certification
- Exams

Teacher qualifications:

An assignment for this course is allowed with one of the following certificates.

- Technology Education: Grades 6-12.
- Trade and Industrial Education: Grades 6-12. This assignment requires appropriate work approval.
- Trade and Industrial Education: Grades 8-12. This assignment requires appropriate work approval.
- Vocational Trades and Industry. This assignment requires appropriate work approval.

