Indiana Department of Education
Academic Standards Content Framework

INTRODUCTION TO TRANSPORTATION

Introduction to Transportation is an introductory course designed to help students become familiar with fundamental principles in modes of land, sea, air, and space transportation, including basic mechanical skills and processes involved in transportation of people, cargo and goods. Students will gain and apply knowledge and skills in the safe application, design, production, and assessment of products, services, and systems as it relates to the transportation industries. Content of this course includes the study of how transportation impacts individuals, society, and the environment. This course allows students to reinforce, apply, and transfer their academic knowledge and skills to a variety of interesting and relevant transportation related activities, problems, and settings.

- DOE Code: 4798
- Recommended Grade Level: 10
- Recommended Prerequisites: None
- Credits: 2 semester course, 2 semesters required, 1 credit per semester, maximum of 2 credits
- Fulfills a Directed Elective or Elective requirement for all diploma types

Application of Content

Intensive laboratory applications are a component of this course and may be either school based or work based or a combination of the two. Work-based learning experiences should be in a closely related industry setting. Instructors shall have a standards-based training plan for students participating in work-based learning experiences.

Content Standards

Domain – History of Transportation

Core Standard 1 Students validate the historical, current, and future importance of transportation technology

Standards

ITT-1.1 Identify and describe different modes of transportation

ITT-1.2 Explore the history of transportation and technical progression

ITT-1.3 Describe technology as it is applied in the context of transportation

ITT-1.4 Identify and evaluate the impact of transportation on daily life

ITT-1.5 Identify major events in the history of the United States that impacted transportation

ITT-1.6 Investigate how historic events changed the course of technological advancement in different modes of transportation

ITT-1.7 Describe the emerging technologies in the transportation industry and how transportation will evolve

Domain – Transportation Technology

Core Standard 2 Students analyze technical components in a transportation system that must be considered when designing and using any form of transportation.

Standards

ITT-2.1 Examine basic vehicle structural and suspension principles as they relate to performance in different modes of transportation

ITT-2.2 Examine how a vehicle is controlled and guided in each of the modes of transportation

ITT-2.3 Identify support systems that are necessary for transportation systems to effectively work

ITT-2.4 Explain the interaction and operation of different internal components in various land, air, and sea vehicles

ITT-2.5 Explore how interrelated systems make the vehicle move through their different environments

Core Standard 3 Students evaluate basic operations and physical principles used in all forms of land, air, space, and water transportation.

Standards

ITT-3.1 Examine Basic Engine Operations of all modes of transportation

ITT-3.2 Differentiate between Basic Engine Classifications

ITT-3.3 Identify different types of power used to propel a vehicular system

ITT-3.4 Examine Basic Principles of Electricity

ITT-3.5 Explain the transfer of power from the source to actual movement

ITT-3.6 Interpret scientific principles in the design of vehicles for each mode of transportation

Domain – Transportation Design

Core Standard 4 Students choose appropriate technical, design and engineering processes used to create different modes of transportation.

Standards

ITT-4.1 Identify appropriate materials used in designing transportation systems

ITT-4.2 Describe the engineering involved in designing the parts of a transportation system

ITT-4.3 Identify the use of standardized parts in the transportation systems

ITT-4.4 Use different measurement methods using a variety of tools

ITT-4.5 Examine how automotive systems help minimize emissions, control engine temperature, and keep occupants safe

ITT-4.6 Compare how mechanical, fluid, and alternative systems work as related to systems in a transportation vehicle

ITT-4.7 Identify and apply math and science principles as related to the appropriate transportation system

ITT-4.8 Examine safety features of a vehicular system

Domain – Career Exploration

Core Standard 5 Students integrate skills and behaviors required for self-sufficiency and management of their personal and professional lives.

Standards

ITT-5.1 Evaluate employment and career pathway opportunities related to established career interest(s) in the field of transportation

ITT-5.2 Evaluate resources that keep workers current in the career field

ITT-5.3 Describe the emerging transportation-related jobs and industry needs

ITT-5.4 Demonstrate skills and attitudes needed for lifelong learning

Domain – Working Safe

Core Standard 6 Students design workplace prodecures based on established regulations to promote a safe working environment.

Standards

- ITT-6.1 Demonstrate appropriate tool safety and shop operations that are common across all the Transportation careers
- ITT-6.2 Identify state and national safety regulations for working in a transportation facility
- ITT-6.3 Identify the function and application of tools, equipment, and technologies used in transportation systems
- ITT-6.4 Practice the proper storage of tools
- ITT-6.5 Practice appropriate shop/lab upkeep and maintenance duties
- ITT-6.6 Practice safety procedures for handling and disposal of hazardous materials
- ITT-6.7 Practice safety procedures in cases of emergency
- ITT-6.8 Choose the appropriate tools to use on particulars systems

Domain – Transportation and Society

Core Standard 7 Students analyze the effects transportation has on our world to determine what is the most efficient and effective vehicles for moving people and goods.

Standards

- ITT-7.1 Examine the possible ways that natural resources could be used to conserve fuel and energy use in various vehicles
- ITT-7.2 Analyze the effects transportation has on the environment by both vehicular and support views
- ITT-7.3 Differentiate alternate fuel options for all modes of transportation
- ITT-7.4 Identify and describe how mass transportation affects society and the environment
- ITT-7.5 Appraise the effect of the built support systems for transportation on the environment

Domain – The Science of Transportation

Core Standard 8 Students integrate science and math concepts used in vehicles in different modes of transportation to understand the relationships of technology development.

Standards

- ITT-8.1 Identify and describe Newton's laws of motion as they pertain to each mode of transportation
- ITT-8.2 Apply and adapt the basic principles and forces of flight
- ITT-8.3 Apply and adapt Archimedes' principle as it pertains to water transportation
- ITT-8.4 Apply and adapt the propulsion as it relates to movement of a vehicle
- ITT-8.5 Investigate how aerodynamics affects the vehicles in each modes of transportation
- ITT-8.6 Explain Bernoulli's principle in transportation modes
- ITT-8.7 Identify and describe energy conversion within each transportation system
- ITT-8.8 Distinguish the different mathematical principles involved in a transportation system such as mass, volume, horsepower, center of gravity, work and power

Career and Technical Student Organizations

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in a Career and Technical Student Organization, such as the **Technology Student Association (TSA).**