

**I. COURSE DESCRIPTION:**

- A. Department Information:  
Division: Technical  
Department: Automotive  
Course ID: ENVT 109  
Course Title: Transportation of Hazardous Materials  
Units: 3  
Lecture: 3 Hours  
Laboratory: None  
Prerequisite: None
- B. Catalog Description:  
Examination of hazardous materials, packaging requirements, and shipping regulations as they apply to the Department of Transportation (DOT), International Air Transport Association (IATA), and the International Maritime Organization (IMO). Focus will be on how to complete shipping papers, select and apply labels and markings, along with proper placarding and loading of transport vehicles.
- C. Schedule Description:  
Examination of hazardous materials, packaging requirements, and shipping regulations.

**II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One**

**III. EXPECTED OUTCOMES FOR STUDENTS:**

Upon completion of this course, students will be able to:

- A. Identify the different classes of hazardous materials.  
B. Explain the three packaging groups.  
C. Determine the correct packaging requirements for the hazardous material being prepared for shipment using the Material Safety Data Sheet (MSDS) and the 49 Code of Federal Regulations (CFR).  
D. Evaluate the information provided by the Material Safety Data Sheet and select the proper shipping name that describes the hazardous material being shipped.

**IV. COURSE CONTENT:**

- A. Introduction to Hazardous Material Transportation  
1. History  
2. Definitions
- B. Laws and Regulations  
1. 49 Code of Federal Regulations (CFR)  
2. 40 Code of Federal Regulations (CFR)  
3. Title 22 California Code of Regulations (CCR)
- C. Hazard Classes  
1. Explosives  
2. Gases  
3. Flammable liquids  
4. Flammable solids  
5. Oxidizers  
6. Poisons  
7. Radioactive  
8. Corrosives  
9. Miscellaneous
- D. Packing Groups  
1. Packing Group I  
2. Packing Group II

- 3. Packing Group III
- E. Hazard Types
  - 1. Hazardous materials
  - 2. Hazardous substances
  - 3. Marine pollutants
- F. Shipping Papers
  - 1. Description of hazardous materials
  - 2. Technical names
  - 3. Shippers certification
  - 4. Hazardous Wastes Manifest
- G. Marking
  - 1. General marking requirements (non-bulk)
  - 2. General marking requirements (bulk)
  - 3. Prohibited markings
  - 4. Authorized abbreviations
  - 5. Liquid hazardous materials
  - 6. Poisonous hazardous materials
  - 7. Explosive hazardous materials
  - 8. Marine pollutants
- H. Labels
  - 1. Requirements
  - 2. Mixed and consolidated packaging
  - 3. Authorized label modifications
  - 4. Placement of labels
- I. Training
  - 1. Responsibility
  - 2. Requirements
- J. Part 172.101
  - 1. Hazardous materials table
  - 2. Appendix A, Hazardous Substances
  - 3. Appendix B, Marine Pollutants
- K. Packaging
  - 1. Inner packaging
  - 2. Outer packaging
  - 3. Composite packaging
  - 4. Non-bulk packaging
- L. International Air Transport Association (IATA)
  - 1. Requirements
  - 2. Specifications
- M. International Maritime Organization (IMO)
  - 1. Requirements
  - 2. Specifications
  - 3. Materials classification

**V. METHODS OF INSTRUCTION:**

- A. Lectures and discussions between the instructor and students will require problem solving by students on proper handling, packaging, and shipping of specific hazardous materials.
- B. Sample problems and situations dealing with the shipping of hazardous materials will require students to evaluate and make decisions using the Material Safety Data Sheets provided.

**VI. TYPICAL ASSIGNMENTS:**

- A. Read assigned lessons and complete weekly homework, which requires research in order to complete each assignment.  
Sample Assignments:
  - 1. Write a two-page paper on how you would ship an environmentally hazardous substance. Explain how you determined the substance was hazardous. Also,

explain why you selected the packaging and mode of transportation required to safely transport the material to its destination.

2. Explain how you would determine a material was a Marine Pollutant. Then, explain how you would package and ship the material. List all documentation used by you to make your decision.

Typical Questions:

- a) What does the "X" stand for in the container certification 4G/X25/S/99?
- b) What is a marine pollutant?

- B. Term Paper – Students will be given a list of five materials that may or may not be hazardous. Students will be required to perform research on each material explaining every step they used in determining the status of the material. This will require students to obtain Material Safety Data Sheets for each material. A detailed explanation will be required indicating why they chose a specific packaging material and mode of transportation for each material. At least one material will be non-hazardous and one forbidden (unable to ship under any circumstances).

**VII. EVALUATION(S):**

- A. Methods of Evaluation:

1. Graded assignments/exercises
2. Midterm/final exam/term project

Typical Questions:

- a) Explain the difference between a hazardous material and hazardous substance.
- b) For how many days, months or years is a fiberboard carton certification valid?

- B. Frequency of Evaluations:

1. Ten (10) exercises
2. Two (2) written assignments
3. One (1) midterm
4. One (1) final and term project

**VIII. TYPICAL TEXT(S):**

49 Code of Federal Regulations (49CFR), The Government Printing Office, Superintendent of Documents, New Orders, 2001, P.O. Box 371954, Pittsburgh, PA 15250-7954

**IX. OTHER SUPPLIES REQUIRED OF STUDENTS:**

None