

**I. CATALOG DESCRIPTION**

- A. Department Information:  
Division: Technical  
Department: Transportation  
Course ID: RAIL 053  
Course Title: Railroad Safety, Quality and Environment  
Units: 3  
Lecture: 3 Hours  
Prerequisite: None
- B. Catalog Description:  
This course covers the importance of safety, quality, and environmental awareness to the railroad industry and emphasizes the tools and techniques for improving these conditions on the job.
- C. Schedule Description:  
This course examines the importance of safety, quality, and environmental awareness in the railroad industry's workplace. Emphasis is placed on the concepts, tools, and techniques for continuous improvements of these areas.

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

**III. EXPECTED OUTCOMES FOR STUDENTS:**

Upon completion of this course, the student will be able to:

- A. Define *Quality* in terms of business outcomes and overall customer satisfaction.
- B. Examine the need for and list the benefits of *Quality* processes in the railroad industry.
- C. List and explain the basic principles of *Quality*.
- D. Evaluate the basic process and structures of a program to improve *Quality*.
- E. Apply the principles and processes of *Quality* improvement to real-life railroad problems.
- F. Assess both the business and human needs for safety and health management in the industry.
- G. List and explain the basic principles of *Safety*.
- H. Distinguish the critical elements of a successful safety/health problem.
- I. Consider the importance of corporate commitment to any safety endeavor.
- J. List and describe most common injuries and safety hazards.
- K. Identify current trends and issues in safety and health management in the railroad industry.
- L. Analyze both business and human needs for environmental awareness in the industry.
- M. List and explain the basic principles of environmental awareness.
- N. Appraise the critical elements of a successful environmental awareness program.
- O. Explain the importance of corporate commitment to environmental awareness.
- P. Evaluate railroads' impacts (positive and negative) on the environment.
- Q. Identify current trends and issues in environmental awareness in the railroad industry.
- R. Categorize the basic principles of hazardous materials handling.

**IV. CONTENT: Quality control Aspects of the Railroads**

- A. Introduction to Railroad Safety, Quality & Environment
  1. Definition and discussion of *Safety, Quality and Environment (SQE)*
  2. Definition of the term *Paradigm*
  3. Importance of thinking about issues in a variety of ways
  4. Goals, similarities and differences of programs to improve SQE
  5. Principles and techniques common to improving SQE
  6. Personal benefits of efforts to improve SQE
  7. Trends in market share for railroads and trucks
  8. Railroad customers' top wishes and how these wishes relate to improved SQE

9. The relationship between personal and industry benefits from improved SQE
- B. The Process of Serving the Customer
  1. Aspects of service important to many customers
  2. Definition of *internal* and *external* customers
  3. Railroad's responsibility in solving problems
  4. Priority of customer service in railroad operations
  5. Meaning and benefits of viewing *Work as a Process*
  6. Flow-charting steps in a simple work process
  7. Definition and benefits of the concepts: *Continuous Improvement, Error-free Attitude, Prevention Rather than Correction, and Adding Value*
- C. Problem Solving
  1. How teams work most effectively to solve problems
  2. Advantages and disadvantages of the team problem solving
  3. Steps in a general problem solving process
  4. Brainstorming and the application of techniques to solving a simple problem
  5. Discussion of the concepts and techniques related to problem solving; these include brainstorming, categorization, data gathering, data displaying, cause and effect analysis, force field analysis, and cost/benefit analysis
  6. Importance of implementation planning
- D. Improving Railroad Quality
  1. Commitment in the *Quality* improvement program
  2. How *Quality* fits within the corporate structure
  3. Role of education in the *Quality* process
  4. Importance of measurement, corrective action, and involvement in the *Quality* process
  5. Application of the principles of *Quality*
- E. Developing Quality Improvement Programs
  1. Development of the *Quality* movement
  2. What *Quality* means
  3. How lapses in *Quality* affect safety and the environment
  4. Need for improved railroad *Quality*
  5. Application of *Quality* principles to railroad situations
- F. The Importance of the Environment
  1. Beginning of widespread public environmental awareness
  2. Trends and effects of world population growth
  3. Importance of coastal areas in water pollution
  4. Sources of water pollution
  5. Causes and effects of ozone depletion, the *Greenhouse Effect*, and endangerment to living creatures
  6. Importance of environmental awareness in the railroad industry
- G. The Costs of Environmental Compliance
  1. Major environmental contaminants from operations
  2. Environmental responsibilities as landowners
  3. Signs of property contamination
  4. Criteria for qualifying property lessees (renters)
  5. Environmental criteria for purchasing property
  6. Responsibilities to disclose suspected contamination
  7. Types of violations
- H. Railroads, the Environment, and the Law
  1. Effects railroads have on fuel efficiency, emissions, land use, hazardous materials transportation safety, general safety, tax support, derailment contamination, and land contamination from past practices
  2. Major environmental legislation affecting railroads
  3. Regulatory agency enforcement steps
  4. Categories of costs to railroad for compliance/non-compliance of environmental laws
  5. R's of environmental awareness
- I. Hazardous Materials Handling

1. Documentation required for hazardous materials
  2. How transportation employees should prevent, recognize, and respond to releases of hazardous materials
  3. Characteristics of suspected pollution on the railroad
  4. Waste management and proper disposal
  5. Civil and criminal liability for noncompliance with regulations
  6. Waste water treatment facilities at railroad locations
  7. Railroad operation that may produce air emissions and the controls to which they must conform
- J. Protecting the Environment
1. Objective of environmental protection programs
  2. Trends in environmental awareness
  3. Model communication, information, and training programs related to implementation of awareness programs
- K. Safety, You and Others
1. Opposing forces that impact worker health and safety
  2. Trends in safety statistics between 1900 and the present
  3. Comparison of safety in railroading to other industries
  4. Potential hazards of railroading
  5. Personal and legal effects of workplace accidents
  6. Business case for safety in the workplace
  7. How worker attitudes affect safety in the workplace
  8. Roles and responsibilities of federal agencies responsible for regulating worker safety, including OSHA, DOT, EPA, FRA, and the NTSB
  9. Employer obligation for workplace safety
- L. Back to Basics
1. Basic safety principles
  2. Effects of personal values on how workers do their jobs
  3. Identification of multiple root causes when determining causes for accident and injuries
  4. How safety principles reflect many of the underlying principles of *Quality* and *Environmental Awareness*
  5. Basic accident analysis procedures
  6. Accident prevention
- M. Safety Principles Again
1. Why all accidents should be preventable
  2. Compare *Quality*, *Environmental Awareness*, and *Safety* principles
  3. Components of a successful safety program
  4. Role of training, evaluation, and safety-first attitudes
  5. Development and content of policies and Safety Policies
  6. Policies and the organization's culture and purpose
- N. Safety Programs from Soup to Nuts
1. Definition of safety rules
  2. Traditional safety rules and their purpose
  3. Modern approaches to safety rules
  4. Role of training and its relation to safety rules
  5. Application of safety rules
  6. Components of a successful safety program
  7. Railroad operating rules and their purpose
  8. Controls against hazards
- O. Be Prepared
1. Purpose and contents of First Aid and CPR courses, emergency preparedness programs, wellness programs, ergonomic programs, personal protective equipment, recognition and incentive programs, and safety committees
  2. Behaviors that promote safety in the workplace
  3. Dangers of complacency in the railroad workplace and how to overcome such complacency

**V. METHODS OF INSTRUCTION:**

- A. Lecture
- B. Discussion
- C. Video
- D. Demonstration

**VI. TYPICAL ASSIGNMENTS:**

- A. A written report will be prepared and turned in to the instructor during the 15<sup>th</sup> class session. Cover and bibliography pages are additional and required. Topic to be chosen within the scope of the course objectives. Student must provide a three-sentence, hand written description of the topic for approval by the instructor before the 4<sup>th</sup> class session. At least two different references will be cited in the report and appropriately documented. An example of a written report is: "Write a report analyzing two problems related to business processes."
- B. An oral report will be presented to the class covering the same topic. The oral report will utilize between 10 and 15 minutes of class time. At least one handout will be provided as part of the oral presentation.
- C. Reading assignments from a learning supplement or information sheet. An example of a reading assignment is: "Read an article in a newspaper, periodical or the division program that focuses on some event that is obviously the result of poor quality or a defect of some kind."
- D. Group assignments or discussion projects. An example of a group assignment is: "You are the members of a Safety Quality Improvement Team. Your team was asked to provide three issues or concerns which need to be addressed at your location which may have potential adverse impact to a safe working environment."
- E. Video learning journal to record and process information gathered from in-class videos. A learning journal will be prepared by each student for a certain number of videos of their choice. This learning journal will be legibly hand written and have three sections: 1.) The key points. 2.) Writer's personal reactions (attitude) to the key points. (These should include personal opinion, judgments, thoughts and feelings.) 3.) A description of what the writer learned. (That is, brand new information received.)

**VII. EVALUATION(S):**

- A. Methods of Evaluation:
  - 1. Quizzes, Tests, or Examinations
  - 2. Assignment & Homework
  - 3. Individual Report
  - 4. Video Learning Journal
- B. Frequency of Evaluation:
  - 1. Weekly Quizzes, Tests, and/or Examinations
  - 2. Daily Assignment & Homework
  - 3. Individual Report
  - 4. Video Learning Journal weekly
- C. Typical Questions:
  - 1. List at least three components of a typical wellness program.
  - 2. Why must safety processes be flexible to be effective?
  - 3. What are the effects of population growth on the environment?

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

Armstrong, J. H., The Railroad – What It Is, What It Does., Fourth Edition, Omaha: Simmons-Boardman Publishing Co., 1998

- IX. OTHER SUPPLIES REQUIRED OF STUDENTS:** Students may be required to obtain safety shoes and safety glasses for use during field trips.