

Mercer County Community College

Arts, Communication and Technology Division

UTI 101

INTRODUCTION TO THE ENERGY UTILITY INDUSTRY

COURSE DESCRIPTION:

To provide participants with an overview of the energy utility industry and occupational opportunities, including but not limited to history of providing reliable service, regulatory influences, electric/gas energy flow and basic terminology, typical conditions for employment, and career opportunities.

Text: **References & Textbooks:**

“The Lineman’ and Cableman’s Field Manual” By T.M. Shoemaker & J.E. Mack,
McGraw Hill Copyright 2000 (ISBN 0-07-135470-0)

Handout & Reference Guides

Prerequisites: ENG101, MAT115

Credits: 3 Lecture Hours: 2 Studio/Lab Hours 2

<p>Food and drink are strictly prohibited in classrooms as per health and safety laws. Students may not bring in chemicals or cleaning fluids without the appropriate MSD sheets.</p>

Course Coordinator: Dominick DeFino

Revised: 12/15/09

A.A.S. Degree – Utility Technology

Course Objectives:

- ❑ Indicate the rationale for historical formation & continued regulation of energy delivery utilities while production & exploration has been deregulated.
- ❑ Describe the regulatory influences from State & Federal agencies effecting energy utilities in the areas of;
 - Regulation/Deregulation
 - Price Controls/Rates
 - Reliability/Quality of Service
 - Safety & Environmental
- ❑ Explain the process of producing electrical energy in fossil & nuclear generating facilities, which provide approximately 90 percent of the energy to regional power grids/pools.
- ❑ Identify the electrical energy delivery system process and functions of each step used to provide customers with reliable energy, including typical voltage levels and construction:
 - Switching Stations
 - PJM Interconnections
 - Transmission
 - Subtransmission
 - Substations
 - Distribution
 - Secondary/Service
- ❑ Explain the general safety role of employees for the protection of themselves, co-workers and the general public, including individual responsibilities and personal protective equipment compliance.
- ❑ Identify the gas energy delivery system process and functions of each step used to provide customers with reliable energy, including typical pressure levels and construction:
- ❑ Participate in discussion, demonstrations and practical exercises that emphasizing the energy utility career opportunities and working conditions for each occupational group, including but not limited to;
 - Entry Level Requirements
 - General Conditions Maintaining Employment
 - Environmental Working Conditions
 - Potential – Fears, Phobias & Obstacles
 - Projected Pay Ranges & Promotional Opportunities
 - Role of Represented Employees

Evaluation Procedure:

Grading Criteria for Participants

The participants will be individual evaluated on the course content utilizing the following criteria:

- Attendance - Mandatory
- Average of Quizzes = 30 % of Total Grade
- Final Examination = 70 % of Total Grade

Course/Instructor Evaluation

The course and instructor evaluation will consist of the following:

- End of Course Reaction Survey which will ask the participant opinion of the course based on within the objectives and outline
- Overall performance of as indicated by participants completion of quizzes, practical & laboratory exercises and final exam
- Instructor observations by PSE&G – Technical Training team to ensure consistence of instructional quality

Topical Outline:

- I. Introduction & Orientation Lecture/Discussion - 3 hours
 - a. **Utility Technology** Program Overview
 - i. Program Scope
 - ii. Program Schedule
 - iii. Business Sector Career Opportunities (Generic)
 - iv. Program Schedule
 - b. Course Objectives
 - c. Schedule (Lecture/Discussion & Laboratory Exercises)
 - d. Evaluation System & Grading Criteria

- II. History of the Utility Industry Lecture/Discussion - 3 hours
 - a. What is a Utility?
 - b. Why Utilities?
 - c. Formation of Utilities
 - d. Types
 - i. Investor Owned
 - ii. Authorities
 - iii. Governmental
 - iv. Cooperative
 - e. Utility Applications
 - i. Electric
 - ii. Gas
 - iii. Water
 - iv. Telephone
 - v. Waste Collection
 - vi. CATV

- III. Regulation of Utilities Lecture/Discussion - 3 hours
 - a. What is Regulation & Deregulation?
 - b. Why Regulate Utilities?

Course: “Introduction to the Energy Utility Industry” ~ Topical Outline:

- IV. Scope of Regulation
 - a. Cost to Customers
 - b. Reliability/Quality of Service
 - c. Safety of General Public

- V. Regulatory Agencies Lecture/Discussion - 3 hours
 - a. State BPU
 - b. DOT
 - c. EPA
 - d. OSHA
 - e. NEC
 - f. NESC
 - g. NRC
 - h. RTO/PJM
 - i. Others

- VI. General Safety *Lecture/Discussion – 3 hours*
 - a. Responsibilities
 - i. Personal
 - ii. General Public
 - b. Requirement
 - i. Legal
 - ii. Companies
 - c. Elements & Components (Overview)
 - d. Typical Personal Protective Equipment (PPE)
 - i. Identification
 - ii. Inspection
 - iii. Rational
 - iv. Proper wearing

- VII. Energy System – Electric System Overview *Lecture/Discussion - 3 hours*
 - a. Production
 - b. Transmission (RTO – PJM & Interconnections)
 - c. Subtransmission
 - d. Distribution
 - e. Secondary/Service

- VIII. Tour of Electric Facilities Lecture/Field Trip - 3 hours
(Application of Basic PPE)
 - a. Transmission
 - b. Switching Station
 - c. Subtransmission
 - d. Substation

- IX. Distribution Energy System – Gas System Overview *Lecture/Discussion – 3 hours*
 - a. Suppliers
 - b. Transmission (GSOC & Interconnections)
 - c. Regulation & Metering
 - d. Distribution

- e. Services

Course: “Introduction to the Energy Utility Industry” ~ Topical Outline:

- X. Tour of Gas Facilities *Lecture/Field Trip – 3 hours
(Application of Basic PPE)*
 - a. Transmission
 - b. Regulation & Metering
 - c. Distribution
 - d. Services

- XI. Energy Utility Career Opportunities – Employment Conditions *Lecture/Discussion – 3 hours*
 - a. Work Environment
 - b. Criteria for Employment
 - c. Criteria for Maintaining Employment
 - d. Promotional Opportunities
 - e. Union Shop

- XII. Energy Utility Career Opportunities – Electric *Lecture/Discussion - 3 hours*
 - a. Positions & Pay Ranges
 - b. Work Environment
 - c. Hands-on Exercise with Electric Opportunities

- XIII. Energy Utility Career Opportunities – Gas *Lecture/Discussion - 3 hours*
 - a. Positions & Pay Ranges
 - b. Work Environment
 - c. Hands-on Exercise with Gas Opportunities

- XIV. Energy Utility Career Opportunities – Appliance Service & Customer Service *Lecture/Discussion - 3 hours*
 - a. Positions & Pay Ranges
 - b. Work Environment
 - c. Hands-on Exercise Other Areas

- XV. Final Exam *Lecture/Discussion - 3 hours*
 - a. Complete Written Final Exam
 - b. Review Final Exam
 - c. Calculate Final Course Grades
 - d. Complete Course Evaluation