

Fond du Lac Tribal and Community College  
**COURSE OUTLINE**

**I. Catalog Information**

A. Title of Course: Introduction to Electric Utilities      B. Course Designator: EUT 1001

C. Number of Credits: Lecture 3 Lab \_\_\_\_\_      D. Control Number: 40

E. Catalog/Course description:

Students will learn the history, terminology, concepts, business structures, governmental regulations, technologies, and future of the electric power utility industry. Activities will include Internet and library research, class discussions, and tours of electric utility sites. Students will learn how electricity affects their lives and culture. The technical skills needed by electric utilities will be discussed.

F. Course prerequisites:  
Concurrent Registration in  
CSCI 1001 Computer Literacy  
ENGL 1001 College Writing or consent of instructor

G. Date Approved: \_\_\_\_\_  
Date Revised: 12/02/09

**II. Course Materials** (Recommended course materials and resources. List all that apply, e.g. textbooks, workbooks, study guides, lab manuals, videos, guest lecturers)

Texts: Electrifying America: Social Meanings of a New Technology -David E. Nye

Other texts to be determined yearly depending on content.

Students will be expected to do Internet and library research, and to write up their findings into research papers. Tours of electric utility sites will be conducted when and where.

**III. Learning Goals, Outcomes, and Assessment** Minimum of one goal and two learning outcomes in each competency. *If your course does not meet one of the Competencies Across the Curriculum, please justify your rationale.* Minimum of two assessment measures for each learning outcome. Add other goals and outcomes as needed. If this course is part of the Minnesota Transfer Curriculum (MnTC), attach the MnTC goals, outcomes, and your assessment measures to this form; if possible, use them to complete the information below.

A. Information Literacy (the ability to use print and/or non-print tools effectively for the discovery, acquisition, and evaluation of information as well as core computer tools for the manipulation and presentation of information.)

1. Learning Goals:

Goal I. Students will be knowledgeable in the Electric Utility Industry

2. Learning Outcomes and Assessments:

Outcome I-1. The student will demonstrate competency in reading technical text.

Assessment: Chapter homework problems will be submitted.

Outcome I-2. The student will be knowledgeable with the D2L platform.

Assessment: The student will access the class information and receive grading info from D2L.

B. Ability to Communicate (the ability to listen, read, comprehend, and/or deliver information in a variety of formats.)

1. Learning Goals:

Goal I. The student will demonstrate the application of Electric Utility industry structure.

2. Learning Outcomes and Assessments:

Outcome I-1. The student will complete and submit a systems report on The Utility Industry.

Assessment: The reports will be graded.

Outcome I-2. The student will participate in verbal report sessions in class.

Assessment: This will be demonstrated via class participation in class session.

C. Problem Solving (the ability to conceptualize, apply, analyze, synthesize, and/or evaluate information to formulate and solve problems.)

1. Learning Goals:

Goal I. The student will demonstrate the ability to recognize problems in the Electric Utility Industry.

2. Learning Outcomes and Assessments:

Outcome I-1. The student will demonstrate the ability to propose solutions to problems in the Electric Utilities forecasts.

Assessment: Reports will have a problem content involved with a success outcome requiring successful problem solving techniques to be employed.

Outcome I-2. The student will demonstrate the ability to recognize and propose solutions to electrical problems.

Assessment: Tests and quizzes.

D. Culture (knowledge of Anishinaabe traditions and culture, knowledge of one's own traditions and culture, knowledge of others' traditions and cultures, and/or respect for global diversity.)

1. Learning Goals:

Goal I. The student will become aware of traditions and standards of the Electric Utility Industry

2. Learning Outcomes and Assessments:

Outcome I-1. The student will be aware of traditional problem solving methods and there history.

Assessment: Tests and Quizzes.

Outcome I-2. The student will be exposed the safety culture developed in the electrical trades.

Assessment: Class review and test questions.

Documentation for MnTC - None

#### **IV. Course Content** (Outline the major topics covered in this course.)

This course is intended to acquaint the student with the history, the business structures, the governmental regulations, the technologies, and the future of the electric power utility industry. Students will do Internet research, library research, and report writing to complete the course requirements. Tours of area electric utilities and other electric technology sites will

be a component of the course. In addition to learning about how electric power permeates our lives and culture, students will learn about the types of careers and professional requirements needed in the future by electric utilities. Students will be expected to write a research report related to their interests in electric utilities, as a course assignment.

1. History
  - a. Discovery of the physics of electricity and magnetism
    1. Franklin
    2. Oersted
    3. Faraday
    4. Maxwell
    5. Hertz and Marconi
  - b. Electrification of the USA and of the world
    1. European electric industries-"the second industrial revolution"
    2. Edison
    3. Westinghouse
    4. Tesla
    5. Electric train systems
    6. Hydroelectric projects: Niagra Falls, Thompson Hydro, etc.
  - c. Rise of the modern electric utility
2. Projects and Organizations: 1900 to 1970
  1. Major hydroelectric projects in the USA
  2. Large coal-fired plants and electric transmission and distribution systems
  3. The rise of electric utilities as regulated monopolies
  4. Rural Electric Association and Federal initiatives
  5. Nuclear power
  6. Federal, State, and municipal regulatory bodies and systems
3. Technical Systems
  1. Power generation technologies: coal, hydro, petroleum, nuclear
  2. Transmission systems: AC & DC transmission lines, technologies, line loss
  3. Distribution systems: technologies, causes of interruptions, insuring reliability
  4. Cogeneration: electric power and heat
  5. Customer interface: connections to the home & business, wiring codes & requirements, power consumption of typical products & tools
  6. Environmental impacts: hydroelectric dams, air emissions, coal mining, nuclear power risks
4. Business Structures and Issues
  - a. Customer needs:
    1. Promoting electric products and power consumption
    2. Promoting electric power conservation and load leveling
    3. Demand-side management
    4. Electric rates paid by groups of customers
  - b. Typical electric utility business structures
    1. Cooperatives
    2. Regulated monopolies
    3. Types of jobs and careers
    4. Economic importance of the industry
  - c. Regulatory issues

1. Making rates
  2. Demand-side management
  3. Cogeneration
5. Future of the Industry
- a. Deregulation of monopolies?
  - b. Sustainable economic practices and environmental impacts
    1. Renewable energy and alternative energy sources
    2. Energy sources and politics
  - c. Distributed energy systems
  - d. New technologies to conserve energy
  - e. New technologies to produce energy
  - f. Off-grid systems
  - g. Electric power and you
    1. health risks?
    2. jobs and careers

(revised October 2009)