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Northeast Wisconsin Technical College

10-481-114 058530 Intro to Energy Management

Course Outcome Summary

Course Information

Description	10-481-114 INTRO TO ENERGY MANAGEMENT ...introduces the basic concepts of energy, utility systems and utility rate structures; defines the need for energy management as an integral part of society at all levels. The course will present the various opportunities available to energy management students.
Total Credits	3
Total Hours	54

Course History

Last Revision Date	4/1/2020
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Employability Skills

- Communicate Effectively
- Demonstrate Community and Global Accountability
- Demonstrate Personal Accountability
- Solve Problems Effectively
- Think Critically and Creatively
- Value Individual Differences and Abilities
- Work Cooperatively and Professionally

Program Outcomes

- TSA1 - Evaluate renewable, fossil and other energy resources in context of sustainability, environment, society and economics
- TSA2 - Evaluate building performance and energy use
- TSA3 - Recommend building/site solutions to optimize performance
- TSA4 - Install equipment and materials to optimize performance
- TSA5 - Service equipment and systems

Course Competencies

1. Describe energy and its different forms.

Assessment Strategies

by describing energy and its different forms.

Learning Objectives

- 1.a. Define energy
- 1.b. Discuss conservation of energy
- 1.c. Contrast energy and energy carrier
- 1.d. Discuss sources of fuel
- 1.e. Describe how 'energy' is produced
- 1.f. Describe how electricity is produced

Criteria

Your performance will be successful when:

you differentiate between kinetic and potential energy.
you identify the different forms of kinetic energy.
you identify the different forms of potential energy.
you describe the concept of conservation of energy
you list the basic forms of energy.

2. Explore the history of energy production and cost in the U.S. and Wisconsin since 1900

Assessment Strategies

by exploring the history of energy production and cost

Learning Objectives

- 2.a. Locate sources for energy information
- 2.b. Review energy production and cost
- 2.c. Summarize energy sources
- 2.d. Recognize social and environmental impacts of energy sources
- 2.e. Discuss trends in energy use and production

Criteria

Your performance will be successful when:

you identify organizations and resources that publish energy data
you list major energy production sources
you compare and contrast energy sources
you create graphs and charts showing energy production and cost

3. Define units for measuring energy and convert between them

Assessment Strategies

by defining units for measuring energy and convert between them.

4. Explain how energy is billed by utilities

Assessment Strategies

by explaining how energy is billed by utilities

Learning Objectives

- 4.a. Define and compare energy and power
- 4.b. Describe how residential and commercial customers are billed for electric and natural gas consumption
- 4.c. Analyze simple utility bills

Criteria

Your performance will be successful when:

you distinguish between energy and power
you study a typical utility rate tariff
you explain the hourly, daily and seasonal patterns of energy use
you analyze simple utility bills

5. Identify how and where energy is used in buildings

Assessment Strategies

by identifying how and where energy is used in buildings

Learning Objectives

- 5.a. Enumerate the types of energy used in buildings
- 5.b. List the equipment that uses energy

Criteria

Your performance will be successful when:

you list the major energy end uses in buildings
you match the energy end uses with equipment in the building
you create graphs of energy end uses
you explain how energy use varies by building type

6. Examine the social and environmental impacts of energy production and consumption

Assessment Strategies

by examining the social and environmental impacts of energy production and consumption

Learning Objectives

- 6.a. Summarize the advantages and disadvantages of energy management
- 6.b. Describe climate change and its implications
- 6.c. Define sustainability applied to energy
- 6.d. Identify federal and state energy programs
- 6.e. Describe current federal and state energy legislation

Criteria

Your performance will be successful when:

you state the advantages and disadvantages of energy management
you characterize the concept of climate change and its implications
you define sustainability applied to energy
you describe federal and state energy programs
you identify current federal and state energy legislation

7. Determine Codes and Standards applicable to energy use in buildings

Assessment Strategies

by determining Codes and Standards applicable to energy use and buildings

Learning Objectives

- 7.a. Identify sources for Codes and Standards
- 7.b. Examine Codes and Standards
- 7.c. Apply Codes and Standards to sample buildings
- 7.d. Explore Energy Star, Leadership in Energy and Environmental Design and other sustainability standards for energy components

Criteria

Your performance will be successful when:

you list state and federal Codes and Standards
you describe the energy aspects of Energy Star and Leadership in Energy and Environmental Design standards
you state the energy units of Codes and Standards
you calculate energy use for sample buildings based on Codes and Standards

8. Describe the energy auditing process

Assessment Strategies

by describing the energy auditing process

Learning Objectives

- 8.a. Describe the various types of energy audits
- 8.b. List the types of data and sources for information necessary to conduct an energy audit

8.c. Summarize the steps in conducting an energy audit

Criteria

Your performance will be successful when:

you describe the types of energy audits

you list the data required and sources for information necessary to conduct an energy audit

you summarize the steps in conducting an energy audit

9. Create an outline of an effective energy management program

Assessment Strategies

by creating an outline of an effective energy management program

Learning Objectives

9.a. Define an effective energy management program

9.b. Identify energy management measures for building energy end uses

9.c. Identify associated budget items necessary for an effective energy management program

9.d. Describe components of an effective energy management program

Criteria

Your performance will be successful when:

your outline describes the energy end uses and associated energy management technologies

your outline describes the energy savings qualitatively

your outline includes an estimated budget for implementing the program

10. Investigate monitoring techniques used to measure and monitor energy use in buildings

Assessment Strategies

by investigating monitoring techniques used to measure and monitor energy use in buildings.

Learning Objectives

10.a. Describe technologies used to measure energy use

10.b. Compare how different types of energy are monitored and measured

Criteria

Your performance will be successful when:

you describe equipment that can be used to monitor electrical, heating, cooling and lighting energy use

you explain how an automated building energy management system works

11. Explore career and educational opportunities for energy management professionals

Assessment Strategies

by exploring career and educational opportunities for energy management professionals

Learning Objectives

11.a. Identify careers for energy management professionals

11.b. Identify educational programs for energy management professionals

11.c. List certifications available to energy management professionals

Criteria

Your performance will be successful when:

you identify sources for education and career information for energy management professionals

you describe a variety of available career paths and requirements for advancing

you explore available educational programs and the requirements for entry

you interview at least one energy management professional

you describe the available certifications