COURSE OUTLINE: CCM104 - ENERGY AUDIT

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Course Code: Title	CCM104: ENERGY AUDIT AND CLIMATE CHANGE
Program Number: Name	5250: CLIMATE CHANGE MIT.
Department:	NATURAL RESOURCES PRG
Academic Year:	2024-2025
Course Description:	Students will gain an understanding of the fundamentals of energy audits and the effects of energy usage on climate change. The course covers building systems including HVAC and other mechanical and electrical components as well as measuring and monitoring building performance. Students will also explore the integration of renewable energy technologies in buildings. Emphasis will be placed on the practical application of energy efficiency measures (EEM`s) in an effort to mitigate climate change.
Total Credits:	3
Hours/Week:	3
Total Hours:	42
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**5250 - CLIMATE CHANGE MIT.** VLO 5 Assess potential environmental threats to human health and natural systems due to climate change and propose adaptive strategies to address them. VLO 9 Evaluate and apply quantification methods for the purpose of compiling a Greenhouse Gas inventory.
Essential Employability Skills (EES) addressed in this course:	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Other Course Evaluation & Assessment Requirements:	Academic success is directly linked to attendance. Missing more than 1/3 of the course hours in a semester shall result in a F Grade for this course.

Books and Required Resources:

Energy Efficiency and Management for Engineers by Mehmet Kanoglu, Yunus A. Cengel
Publisher: McGraw-Hill Education Edition: 1st
ISBN: 9781260459098
Contact Professor for access through Sault College library.

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
1. Understanding Energy Audits	1.1 Explain the concept and types of energy audits, and their benefits. 1.2 Discuss the role of energy audits in reducing greenhouse gas emissions. 1.3 Outline the steps and methodologies for conducting comprehensive energy audits. 1.4 Discuss the importance of accuracy and standard operating conditions in energy auditing.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Energy consumption, efficiency and climate change	2.1 Interpret and analyze energy consumption data to identify high energy use areas. 2.2 Differentiate between various energy sources and assess their environmental impacts. 2.3 Identify and evaluate common energy efficiency measures in buildings 2.4 Discuss the role of proper monitoring, maintenance and operation in sustaining energy efficiency.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Building Systems and Heat Loss	3.1 Define the building envelope and its components, emphasizing thermal resistance. 3.2 Identify and quantify common areas of heat loss and energy use in buildings. 3.3 Discuss strategies to reduce heat loss and improve thermal performance. 3.4 Evaluate different mechanical and electrical building strategies that can improve and enhance energy performance.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Heating, ventilation, and air conditioning (HVAC) systems	4.1 Identify and explain the main components and functions of HVAC systems. 4.2 Analyze the efficiency and performance of different HVAC systems. 4.3 Identify opportunities for improving HVAC system efficiency and reducing energy consumption. 4.4 Discuss the process and benefits of implementing HVAC system upgrades.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Energy Efficiency Measures	5.1 Identify and explain different energy efficiency measures and renewable energy technologies and their applications. 5.2 Assess the feasibility and potential of energy efficiency measures in buildings.

	5.3 Evaluate the costs, benefits, and environmental impacts of different renewable energies and energy efficiency measures

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Field Work Assignments / Project	25%
Personal Reflection	5%
Quizzes	20%
Test #1	25%
Test #2	25%

Date: August 26, 2024

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.