SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: SCI 1XX SCI-105 Department: Engineering and Physics Sciences Department

Course Title: Science of Sustainable Energy and Global Warming Semester: Spring Year: 2023

Course Objective	Competencies
1. Introduction to history of modern energy use, Energy crisis, climate change and global warming. Identify the basics of science principles and physic concepts.	**The students will be able to:** 1. Classify the historical details of the evolution of energy production. 2. Recognize the difference between climate change and global warming by examining resent world events and relate them to climate change or global warming. 3. Calculate their carbon footprint and identify ways they can lower their carbon footprint. 4. Examine the energy crisis by reading technical articles and discussing the main issues within a specific country or continent.
2. Introduction to Renewable Energy. Define and categorize the different types of renewable energy.	1. Define efficiency in terms of useable energy vs. wasted energy in an energy-using device. 2. Identify the Energy sources that are Renewable through

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	reading technical articles and websites.
3. Introduction to Solar Energy. Identify the main concepts in solar energy.	1. Explain the basic concepts of solar cells and what they are used for. 2. Explore the basic concepts of Electric Energy by using solar cells. 3. Measure the voltage ,current and resistance produced directly by a solar panel 4. Interpret the data given from solar panel displays
4. Evaluate Electric Energy and the main physics principles and laws involved in electrical energy.	1. Identify the basic concepts of Electric Energy by using solar, wind, water, hydrogen and fuel cell turbines or panels. 2. Measure voltage of solar panels, wind turbines, hydroelectric turbines and fuel cells. 3. Understand the growing field of electric cars.
5. Explore Wind Energy's basic science principles.	1. Define the basic concepts of wind energy 2. Describe the different types of wind turbines. 3. Calculate how wind turbines turn the wind energy into electrical energy.

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	4. Measure voltage, current and resistance output as wind turbine speed is changed.
6. Introduction to Fuel cells	1. Understand the basic concepts of fuel cells by identifying the basic parts of a fuel cell and describe how each part works. 2. Demonstrate how fuel cells work and the different types of fuel cells and what they are used for through multiple choice quizzes and preforming virtual hands on experiments.