

SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: PHYS 160 Department: Physics Department

Course Title: Physics of Green Energy Semester: Spring Year: 2010

Course Objective	Competencies
<p>1. Introduction to history of modern energy use, Energy crisis, carbon emissions, pollution, Energy de-regulation and global warming</p> <p>2. Introduction to Solar Energy</p> <p>3. Introduction to Chemical Energy</p> <p>4.0 Introduction to Magnetic Energy</p>	<p>The students will be able to:</p> <p>1. describe in writing the historical details of the evolution of energy production.</p> <p>2. define efficiency in terms of useable energy vs. wasted energy in an energy-using device</p> <p>1. understand the basic concepts of solar cells and what they are used for.</p> <p>2. understand the basic concepts of Electric Energy by using solar cells.</p> <p>3. measure the voltage ,current and resistance produced directly by a solar panel</p> <p>4. understand the data given from solar panel displays</p> <p>1. understand the basic concepts of chemical energy by using batteries.</p> <p>2. understand the basic battery types, uses and limitations for energy</p> <p>3. measure voltage of a battery.</p> <p>1. understand the basic concepts of electromagnetic induction and generators</p>

Course Objective	Competencies
5. Introduction to Wind Energy	<ol style="list-style-type: none"> 2. understand the components of a ac/dc generator 3. relate generators both small and large. 1. understand the basic concepts of wind energy 2. understand what wind turbines. 3. understand the how wind turbines turn the wind energy into electrical energy. 4. be able to measure voltage, current and resistance output as wind turbine speed is changed.
6. Introduction to Hydro-Electric Energy	<ol style="list-style-type: none"> 1. understand the basic concepts of water energy 2. understand the basic concepts of hydro-electric turbines 3. understand the basic concepts of Electric Energy by using ocean and wave energy conversion. 4. understand tide level energy conversion
7. Introduction to Geo-Thermal Energy	<ol style="list-style-type: none"> 1. understand the basic concepts of Geo-Thermal energy 2. explain the concepts of geo-thermal steam turbines.
8 Introduction to Electric Energy	<ol style="list-style-type: none"> 1. understand 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, hydro-electric turbines and fuel cells.
9. Introduction to Hydrogen Energy	<ol style="list-style-type: none"> 1. understand the basic concepts of hydrogen energy and hydrogen powered vehicles.
10. Introduction to Fuel cells	<ol style="list-style-type: none"> 1. understand the basic concepts of fuel cells, 2. understand how they work and the different types of fuel cells and what they are used for.
11. Introduction to Nuclear Energy	<ol style="list-style-type: none"> 1. understand the basic concepts of Nuclear energy

Course Objective	Competencies
	2. understand how nuclear power plants operate, how radioactive decay occurs and emissions of radioactive particles/photons 3. understand fission and fusion.