

# COURSE SYLLABUS

<b>Course Title:</b>	Applied Renewable Energy for Businesses & Residences	<b>Date submitted:</b>	3/1/18 (AAC: 18-09)	
<b>Department:</b>	Business and Technology			
<b>Curriculum:</b>	AAS Degree in Energy Management			
<b>Course Descriptors:</b> Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system.	<b>Course Code:</b> (eg. ACC 101)	<b>NRG*130</b>		
	<b>Course Type:</b>	<b>X</b>		
	A: Clinical B: Lab D: Distance Learning I: Individual/Independent L: Lecture N: Internship M: Seminar P: Practicum U: Studio X: Combined Lecture/Lab Y: Combined Lecture/ Clinical/Lab Z: Combined Lecture/Studio			
	<b>Elective Type:</b>	<b>G</b>		
	AH: Art History E: English FA: Fine Arts G: General HI: History HU: Humanities LA: Liberal Arts FL: Foreign Language M: Math S: Science SS: Social Science			
	<b>Credit Hours:</b>	<b>3</b>		
	<b>Developmental:</b> (yes/no)	<b>No</b>		
	<b>Contact Hours:</b>	Lecture:	1.5	
		Clinical:	0	
		Lab:	1.5	
	Studio:	0		
	Other:	0		
	TOTAL:	3		
<b>Class Maximum:</b>	24			
<b>Semesters Offered:</b>	Fa			
<b>Prerequisites:</b>				
Placement into Intermediate Algebra (MAT*137) and Composition (ENG*101), and C-/better in Introductory Physics (PHY*110) AND Spreadsheet Applications (CSA*135).				
<b>Corequisites:</b>				
None				
<b>Other Requirements:</b>				
None				
<b>Catalog Course Description:</b>	Focuses on the practical application of renewable energy technologies. Topics include energy and resource conservation and project siting, economics, financing, renewable energy and tax credits, technical and engineering aspects, regulatory issues, energy storage, monitoring and verification. Students study the advantages, limitations and potential of various energy sources. Wind, solar, small-scale hydro, ground-source heat pumps, combined heat and power, biofuels, fuel cells, and other technologies are examined. Students will learn the strategies and cost/benefit analyses employed by energy analysts to meet demand with clean energy production. Students will also complete their own study and proposal for a renewable energy project.			
<b>Topical Outline:</b> List course content in outline format.	<ul style="list-style-type: none"> <li>• Energy Sources and Environmental Effects</li> <li>• Electrical Fundamentals</li> <li>• Solar Photovoltaics                         <ul style="list-style-type: none"> <li>○ Solar Power Systems - Electrical</li> </ul> </li> </ul>			

	<ul style="list-style-type: none"> <li>○ Solar Power Systems - Thermal</li> <li>○ Solar Tracking</li> <li>● Midterm</li> <li>● Financing Renewable Energy Projects, guest speaker             <ul style="list-style-type: none"> <li>○ Charge Controllers</li> <li>○ Inverters</li> </ul> </li> <li>● Wind Power Fundamentals             <ul style="list-style-type: none"> <li>○ Wind Power Systems</li> <li>○ Wind Turbine Control</li> </ul> </li> <li>● Biomass Technologies</li> <li>● Geothermal Power Generation</li> <li>● Midterm</li> <li>● Hydropower</li> <li>● Fuel Cells</li> <li>● CT Renewable Energy Projects, guest speaker</li> <li>● Generators</li> <li>● Connecting to The Grid</li> <li>● The Big Picture, Putting It All Together</li> </ul>
<p><b>Outcomes:</b> Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.</p>	<p><b>Upon successful completion of this course, the student will be able to do the following:</b></p> <ol style="list-style-type: none"> <li>1. demonstrate an ability to use critical thinking and problem solving skills to evaluate business energy use and how and when to apply renewable energy solutions</li> <li>2. demonstrate an understanding of, and assess the obstacles associated with implementation of renewable energy systems</li> <li>3. evaluate the advantages, limitations and potential of various clean energy sources for buildings and businesses</li> <li>4. demonstrate an understanding and familiarity with engineering and financial aspects of projects</li> <li>5. demonstrate an understanding and familiarity with the regulatory aspects of renewable energy projects</li> <li>6. demonstrate an understanding and familiarity with the State policies, financing and utility-led programs in CT</li> <li>7. produce a clean energy project proposal for a business, residence or nonprofit</li> </ol>
	<p><b>PROGRAM:</b> <i>(Numbering reflects Program Outcomes as they appear in the college catalog)</i></p> <ol style="list-style-type: none"> <li>5. develop and evaluate inferences and predictions that are based on collected data</li> <li>7. demonstrate an ability to use problem-solving techniques &amp; mathematics to transform concepts into energy related projects</li> </ol>
	<p><b>GENERAL EDUCATION:</b> N/A</p>

<p><b>Evaluation:</b> List how the above outcomes will be assessed.</p>	<p><b>Assessment will be based on the following criteria:</b></p> <p>Class Participation..... 15%</p> <p>Homework Assignments ..... 15%</p> <p>Project Presentation..... 15%</p> <p>Wiki contributions ..... 10%</p> <p>Chapter Quizzes ..... 10%</p> <p>Midterms (2)..... 20%</p> <p>Final Exam ..... <u>15%</u></p> <p style="text-align: right;">100%</p>
<p><b>Instructional Resources:</b></p> <p>List library (e.g. books, journals, on-line resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.</p>	<p><b>Required:</b> Smartboard</p> <p><b>Desired:</b></p>
<p><b>Textbook(s)</b></p>	<p>Renewable Energy Systems, David Buchla, Thomas Kissell and Thomas Floyd, Pearson, 2015, ISBN: 978-0-13-262251-6. Hardcopy available in the bookstore, eBook available at <a href="http://www.mypearsonstore.com/bookstore/renewable-energy-systemssubscription-9780133082012?xid=PSED">http://www.mypearsonstore.com/bookstore/renewable-energy-systemssubscription-9780133082012?xid=PSED</a></p> <p>Integration of Renewable Sources of Energy, 2nd Edition, Felix A Farret and M. Godoy Simoes, Wiley, 2018, ISBN: 978-1-11-913737-5, available in the library, intended for reference only.</p> <p>Class Handouts &amp; Tutorials</p> <p>Online readings of OER's.</p>