

COURSE SYLLABUS

Course Title:	Energy Control Strategies	Date submitted:	December 2017 (AAC:17-67)	
Department:	Business & Technology			
Curriculum:	Energy Management Program			
Course Descriptors: Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system.	Course Code: (eg. ACC 101)	NRG*124	Prerequisites: C- or better in Commercial HVAC Systems & Analysis (NRG*122) and Energy Efficiency Methods (NRG*123)	
	Course Type:	X/D		
	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			
	Elective Type:	G	Corequisites: Spreadsheet Applications (CSA*135) or permission of Program Coordinator	
	AH: Art History E: English FA: Fine Arts FL: Foreign Language G: General HI: History HU: Humanities LAS: Liberal Arts & Sciences M: Math S: Science SS: Social Science			
	Credit Hours:	3		
	Developmental: (yes/no)	No		
	Lecture:	2		
	Clinical:	0		
	Lab:	2		
Studio:	0			
Other:	0			
TOTAL:	4			
Class Maximum:	24	Other Requirements: None		
Semesters Offered:	Sp			
Catalog Course Description:	An introduction to basic control theory as it relates to building HVAC systems. Integration of various HVAC concepts and control systems facilitates the completion of an energy savings calculation project. Topics include building system control theory and devices, including electric, pneumatic, and digital controls. An emphasis is placed on identifying and understanding control strategies to estimate energy savings. Hands on labs reinforce device identification. Students complete an energy efficiency controls calculation project.			
Topical Outline: List course content in outline format.	<ol style="list-style-type: none"> 1. Systems theory 2. Building system control theory and devices <ul style="list-style-type: none"> o Electric o Pneumatic o Digital controls 3. Identifying and understanding control strategies to estimate energy savings 4. Hands on labs to reinforce device identification 5. Student energy efficiency controls calculation project 			
Outcomes:	Upon successful completion of this course, the student will be able to:			

<p>Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.</p>	<p>demonstrate an accurate understanding of-</p> <ul style="list-style-type: none"> • basic control theory • how various HVAC components fit together in a system • the most common control strategies used in HVAC • how control sequences affect energy savings through their own analyses • the use of energy calculations, actually using them to problem solve • the design and creation of a small working HVAC controls system • the manipulation of the campus energy management system, in cooperation with the campus Facilities Department <hr/> <p>PROGRAM: <i>(Numbering reflects Program Outcomes as they appear in the college catalog)</i></p> <ol style="list-style-type: none"> 1. evaluate energy use patterns of residential and commercial buildings 2. recommend energy efficiency and renewable energy solutions for high energy consuming buildings 3. demonstrate an understanding of the interaction between energy consuming building systems and based on that understanding make energy consumption recommendations 4. produce energy evaluation technical reports and make presentations leading to project implementation 5. develop and evaluate inferences and predictions that are based on collected data 6. read and analyze building blue prints including floor, mechanical, and electrical 7. use problem-solving techniques & mathematics to transform concepts into energy related projects <hr/> <p>GENERAL EDUCATION: <i>(Numbering reflects General Education Outcomes as they appear in the college catalog)</i></p> <p>7. Quantitative Reasoning -Students will learn to recognize, understand, and use the quantitative elements they encounter in various aspects of their lives. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.</p> <p>Demonstrates: Interprets numerical information and applies sufficient laws of logic and mathematics to solve problems using numbers, symbols, graphs and/or descriptions.</p> <p>Does Not Demonstrate: Misinterprets numerical information or insufficiently applies laws of logic and mathematics to solve problems using numbers, symbols, graphs and/or descriptions.</p>
<p>Evaluation: List how the above outcomes will be assessed.</p>	<p>Assessment will be based on the following criteria:</p> <p>Homework Midterm Final exam Project</p>
<p>Instructional Resources:</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>Required: Coordination with campus Facilities Department</p> <p>Desired: None</p>
<p>Textbook(s)</p>	<p>Fundamentals of HVAC Control Systems (IP Edition), Montgomery & McDowall, ISBN 978-0-08-055233-0</p>