

COURSE SYLLABUS

Course Title:	Environmental Systems		Date submitted:	Fall 2015 (AAC: 15-69)	
Department:	Business & Technology Department				
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)	ARC*240	Prerequisites:		
	Course Type:	X/D	Placement into Composition (ENG*101) AND placement into Introductory Algebra (MAT*094)		
	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			
	AH: Art History E: English FA: Fine Arts G: General HI: History HU: Humanities LAS: Liberal Arts & Sciences FL: Foreign Language M: Math S: Science SS: Social Science				
	Credit Hours:	3	Corequisites:		
	Developmental: (yes/no)	No	None		
	Lecture:	2			
	Clinical:	0			
	Lab:	2			
Studio:	0				
Contact Hours:	Other: 0				
	TOTAL: 4	Other Requirements:			
Class Maximum:	24	None			
Semesters Offered:	Sp				
Catalog Course Description:	Imparts knowledge of the interior environment of structures large and small. The interrelationship of energy, climate, site, and architectural design are studied. Conservation of nonrenewable energy sources is an intrinsic theme. A study of the design factors in heating, cooling, plumbing, fire protection and electrical systems is included.				
Topical Outline: List course content in outline format.	<p>PART I – DESIGN CONTEXT</p> <p>Chapter 1: Design Process</p> <p>Chapter 2: Environmental Resources</p> <p>Chapter 3: Sites and Resources</p> <p>Chapter 4: Comfort and Design Strategies</p> <p>Chapter 5: Indoor Air Quality</p> <p>PART II – THERMAL CONTROL</p> <p>Chapter 6: Solar Geometry and Shading Devices</p> <p>Chapter 7: Heat Flow</p> <p>Chapter 8: Designing for Heating and Cooling</p> <p>Chapter 9: HVAC for Smaller Buildings</p>				

	<p>Chapter 10: Larger Building HVAC Systems</p> <p>PART III – ILLUMINATION Chapter 11: Lighting Fundamentals Chapter 12: Light Sources Chapter 13: Lighting Design Process Chapter 14: Daylighting Design Chapter 15: Electric Lighting Design Chapter 16: Electric Lighting Applications</p> <p>PART IV – ACOUSTICS Chapter 17: Fundamentals of Architectural Acoustics Chapter 18: Sound in Enclosed Spaces Chapter 19: Building Noise Control</p> <p>PART V – WATER AND WASTE Chapter 20: Water Resources Chapter 21: Water Supply Chapter 22: Liquid Waste Chapter 23: Solid Waste</p> <p>PART VI – FIRE PROTECTION Chapter 24: Fire Protection</p> <p>PART VII – ELECTRICITY Chapter 25: Principles of Electricity Chapter 26: Electrical Systems and Materials: Service and Utilization Chapter 27: Electrical Systems and Materials: Wiring and Raceways Chapter 28: Electric Wiring Design Chapter 29: Photovoltaic Systems</p> <p>PART VIII – SIGNAL EQUIPMENT Chapter 30: Signal Systems</p> <p>PART IX – TRANSPORTATION Chapter 31: Vertical Transportation: Passenger Elevators Chapter 32: Vertical Transportation: Special Topics Chapter 33: Moving Stairways and Walks</p>
<p>Outcomes: Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.</p>	<p>Upon successful completion of this course, the student will be able to do the following:</p> <ul style="list-style-type: none"> • appraise the interior environment of structures large and small and the interrelationship of energy, climate, site and architectural design • examine sustainable design concepts and non-renewable energy sources • evaluate the design factors for heating, cooling, plumbing, vertical transportation and fire protection <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

	<p>plans</p> <p>7. use problem-solving techniques & mathematics to transform concepts into energy related projects</p>
	<p>GENERAL EDUCATION: <i>(Numbering reflects General Education Outcomes as they appear in the college catalog)</i></p> <p>2. Critical Analysis/ Logical Thinking - Students will be able to organize, interpret, and evaluate evidence and ideas within and across disciplines; draw reasoned inferences and defensible conclusions; and solve problems and make decisions based on analytical processes.</p> <p>Demonstrates: Identifies the issue(s); formulates an argument; explains and analyzes relationships clearly; draws reasonable inferences and conclusions that are logical and defensible; provides support by evaluating credible sources of evidence necessary to justify conclusions.</p> <p>Does Not Demonstrate: Identifies few or no issues; formulates an argument without significant focus; provides an unclear explanation of analysis and relationships; drawing few reasonable inferences and conclusions that are illogical and indefensible; provides little to no support using credible sources of evidence necessary to justify conclusions.</p>
<p>Evaluation: List how the above outcomes will be assessed.</p>	<p>Assessment will be based on the following criteria:</p> <p>Tests Assignments (3) Final Exam 3 Class participation: Class discussions Case studies presentations</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: None</p> <p>Desired: None</p>
<p>Textbook(s)</p>	<p>Required Text: Stein, Reynolds, Grondzik, Kwok: Mechanical and Electrical Equipment for Buildings, 11th Edition</p>