COURSE SYLLABUS

Tunxis Community College

Education That Works For a Lifetime

Course Title:	Energy Efficiency Methods	Date submitted:	May 2020 (AAC: 20-17)
Department:	STEAM		
Curriculum:	Tech Studies: Energy Management Option		

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 123
Course Type:	L/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

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

Credit Hours:	3
Developmental: (yes/no)	No
Contact Hours: Lecture:	3
Clinical:	0
Lab:	0
Studio	0
Other:	0
TOTAL:	3
Class Maximum:	24
Semesters Offered:	Sp/F

Prerequisites:

C- or better in NRG 101 – Introduction to Energy

Corequisites:

None

Other Requirements:

None

Catalog Course Description:

A systems approach is used to analyze the input, output, and efficiency of commonplace energy conversion devices. Included are motors, fans, pumps, heat engines, domestic hot water heaters, furnaces, boilers, refrigeration devices, and heat pumps. In so doing students (1) become fluent in the use of the many different units used to denote and measure energy/power (2) learn what quantities need to be measured to determine energy/power in different systems (3) determine the energy/cost savings associated with different efficiency improvement strategies.

Topical Outline: List course content in outline format.	• Intro, Units, Scientific Notation, Significant Figures • Mechanical Systems • Mechanical Systems, Motors • Fluid Systems, Fan Tables • Electrical Systems • Induction, 3-Phase Power, Power Factor • Thermal Systems • Thermodynamics, Heat Engines, Combustion • HVAC Efficiency, Heat Pumps • Understanding of Energy Bills • Valuation of Savings Resulting from Energy projects • Understanding of Financial Metrics
Outcomes: Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.	Upon successful completion of this course, the student will be able to do the following: • Comprehend the various units of measure for energy and associated efficiencies. • Understand the elements of electric and natural gas utility rate tariffs and their impact on selection technologies for energy savings. • Demonstrate the understanding of the basic concepts of thermodynamics. • Evaluate the energy savings generated by implementing efficient electrical and mechanical building technologies and their impact on the performance of the building as a whole. • Determine the cost savings associated with the different efficiency improvement strategies. • Analyze energy projects utilizing metrics to influence a potential decision maker to implement developed projects • Utilizing skills learned in class, produce a detailed energy analysis utilizing spreadsheets and granular environmental data available in the public domain.
	TECH STUDIES PROGRAM, ENERGY OPTION: *(Numbering reflects Program Outcomes as they appear in the college catalog)* 2. utilize the tools, materials, techniques, and technical processes of engineering and technology when solving technical problems 6. identify energy conversion processes and their relation to engineering and technology **ENERGY CERTIFICATE:** 3 perform energy analysis on potential conservation measures in commercial/industrial settings, and incorporate both conceptual and technical understanding in their project reports 4 demonstrate an increased proficiency with spreadsheets, charts, and graphs in Excel 5 practice technical writing and oral skills and will create technical documents
	GENERAL EDUCATION: *(Numbering reflects General Education Outcomes as they appear in the college catalog)* None

Evaluation: List how the above outcomes will be assessed.	Assessment will be based on the following criteria: Homework Projects Quizzes and Exams
Instructional Resources: 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.	Required: None Desired: None
Textbook(s)	Recommended, latest version of: • GUIDE TO ENERGY MANAGEMENT, 8th Edition, Capehart, Turner and Kennedy, published by The Fairmont Press, Inc., 2016. • www.fairmontpress.comHandbook of Formulae, Equations, & Conversion Factors for the Energy Professional, Author: Bryan. Kerwin and Kerwin, Publisher: JOB publications