MECHANICAL ENGINEERING PROGRAM

ABET COURSE SYLLABUS

ME 415 Energy Conversion (4 Units) Elective

Course Description: (2013-15 Catalog) Engineering aspects of energy sources, conversion and storage. Topics selected from fossil fuel systems, nuclear power, thermoelectric systems, thermionic converters, fuel cells, magnetohydrodynamic generators, and geothermal, tidal, wind and ocean temperature energy conversion systems. 4 lectures.

Prerequisite Courses: ME 302

Prerequisites by Topic: Thermodynamics I

Textbook: (and/or other required material) Renewable and Efficient Electric Power Systems, 2nd Edition, Gilbert S. Masters, Wiley Interscience, 2013.

References: None

Course Coordinator/Instructor: Andrew Kean, Associate Professor of ME

Course Learning Outcomes:

1. Reinforce fundamental concepts from Thermodynamics.

2. Establish a fundamental familiarity of energy sources and various energy conversion methods and systems. This fundamental familiarity will serve as a basis for further study, research, and/or work in energy systems in the context of global energy concerns.

3. Analyze the design and principles of operation of chosen energy systems.

4. Synthesize existing knowledge to evaluate future types of energy conversion technologies.

Relationship of Course to MECHANICAL ENGINEERING Program Outcomes:												
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*l*	*m*
H	**L**	**M**	**H**	**H**	**M**	**H**	**H**	**H**	**H**	**M**	**H**	**M**

Topics Covered: Specific topics vary depending on student interests, but generally include most of the following:
Electricity production and carbon dioxide emissions
Nuclear Power
Distributed Generation
Fuel Cells

	Wind Power Solar Power (thermal and photovoltaic) Biofuels	
Laboratory Projects:	None	
Class/Lab Schedule:	Four 50-minute lectures per week or Two 110-minute lectures per week	
Contribution of Course to Meeting the Professional Component:	(a) College-level mathematics and basic sciences:	0 credits
	(b) Engineering Topics:	4 credits
	Design:	0 credit
	(c) General Education:	0 credits
	(d) Other:	0 credits
Prepared by: Andrew Kean	**Date:** 9/11/13	