

MECHANICAL ENGINEERING PROGRAM

ABET COURSE SYLLABUS

ME 415 Energy Conversion (4 Units) Required for Energy Resources Concentration, Elective for all others

Course Description: (2019-20 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)	<u>Renewable and Efficient Electric Power Systems</u> , 2 nd Edition, Gilbert S. Masters, Wiley Interscience, 2013.
References:	None
Course Coordinator/Instructor:	Andrew Kean, Professor of ME
Course Learning Outcomes:	The student will be able to: <ol style="list-style-type: none">1. Apply thermodynamic concepts to a broad range of energy conversion technologies.2. Demonstrate familiarity with energy sources and various energy conversion methods and systems.3. Perform independent and group study, research, and/or work in energy systems in the context of global energy concerns.4. Analyze the design and principles of operation of chosen energy systems.5. Synthesize existing knowledge to evaluate future types of energy conversion technologies.
Relationship of Course to Mechanical Engineering Student Outcomes:	SO 1: Mastered (M) SO 2: SO 3: Mastered (M) SO 4: Mastered (M) SO 5: Mastered (M) SO 6: SO 7:

Topics Covered:	Specific topics vary depending on student interests, but generally include most of the following: Thermodynamics Review (3 lectures) Energy and climate concerns (3 lectures) Electric Power Fundamentals (3 lectures) Electric Power Industry (3 lectures) Nuclear Power (3 lectures) Distributed Generation (2 lectures) Fuel Cells (3 lectures) Wind Power (3 lectures) Solar Power (thermal and photovoltaic) (6 lectures)	
Laboratory Projects:	None	
Class/Lab Schedule:	Four 50-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 credits
	(c) General Education:	0 credits
	(d) Other:	0 credits
Prepared by: Andrew Kean	Date: 2/21/20	
