The Hashemite University
Faculty of Engineering
Course Syllabus
Department of Mechanical Engineering

Course title:	**Energy Conservation 3 (3,0, 0)**	**Course Number:**	110402562
Designation:	Elective	**Prerequisite(s):**	110402222
Instructor:	Dr. Ahmad ALMIGDADY	**Instructor's e-mail:**	ahmad.alqan@gmail.com
Office Hours:	{Mon, Wed} ➔ (12:30 - 14:00)		

Course Description (catalog): The course will begin with the fundamentals of energy and continue with the fundamentals of energy audit and how to write an energy audit report. An introduction to energy saving calculations will be followed by fundamentals of economic analysis. A description of the mechanical and electrical systems will be followed by the energy efficiency opportunities. Energy efficiency in buildings with an emphasis on passive and active solar energy use will be introduced.

Textbook(s) and/or Other Supplementary Materials:

i. Guide To Energy conservation _Management, B. L. Capehart, W. C. Turner, W. J. Kennedy, 4th edition, The Fairmont Press, Inc., 2003
ii. Lecture Notes prepared by the instructor

References:
Energy Management Handbook, W. C. Turner, The Fairmont Press, Inc., 2001

Major Topics Covered:

Topics	No. of Weeks	Contact hours*
The fundamentals of energy & The Energy Audit Process		
Economic Analysis and Economic Decisions for Energy Projects		
Energy Efficiency Opportunities in Buildings		
Lighting and Lighting Systems		
Boilers		
Heating and cooling		
Ventilation		
Distribution Systems in Heating and Cooling		
Electrical Systems		
Total	**15**	**45**

*Contact hours include lectures, quizzes and exams

Specific Outcomes of Instruction (Course Learning Outcomes):

After completing the course, the student will be able to:

1) Identify the properties and the state of a pure substance using thermodynamic tables and locate the substance state on the phase diagram. . These properties include: pressure, temperature, specific volume, internal energy, enthalpy, entropy, etc. **(a,e)**
2) Studying the behavior of ideal gases and use thermodynamic tables to determine their properties. **(a,e).**
3) Applying the first law of thermodynamics of thermodynamic to a closed system **(a,e).**
4) Application of first law of thermodynamic to a n open system "control volumes and control surfaces" **(a,e)**
5) Demonstrate the second law of thermodynamics and the concept of entropy **(a,e)**

Student Outcomes (SO) Addressed by the Course:

#	Outcome Description	Contribution
General Engineering Student Outcomes		
(a)	an ability to apply knowledge of mathematics, science, and engineering	H
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	H
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	
H=High, **M**= Medium, **L**=Low		

Grading Plan:	First Exam	(25 Points)	**Thursday November 3**
	Second Exam	(25 Points)	**Thursday December 8**
	Homework's	(10 points)	TBA
	Final Exam	(40 points)	TBA

General Notes: The home work assignment will include analyzing an integrated thermodynamic system that may contain various components like turbine, compressor, pump, expansion valve, heat exchangers, boiler, mixing chambers and/or piston-cylinder assembly

Prepared by: Dr. Ahmad ALM IGDADY **Date:** 18th January 2017