Hashemite University
College of Engineering
Department of Electrical Engineering
EE 561- Renewable Power Generation (3 Credit Hours/Dept. compulsory)

			Grading info				
Instructor	Dr : Issa Etier		Test 1	30%			
Email:	etier@hu.edu.jo		**Project**	30%			
Office:	Eng.3069		Final	40%		Location	online
Classes Info:	Sun, , Tue, , Thurs:9:00- 10:00 Sun, , Tue, , Thurs:11:00- 12:00						

Course

Course Number:	110409561
Prerequisite:	Power Systems (110409461) Converting the followings: - Basic knowledge of power systems Concepts. - Transformers. - Series impedance of transmission lines. - Capacitance of transmission lines. - Current and voltage relations on a transmission line. - The admittance model and network calculations. - The impedance model and network calculations.
Textbook:	Renewable and Efficient Electric power Systems, Second Edition, Wiley, 2013
Course Description:	This course provides the students with power and energy units, energy carriers, power and energy sources, renewable energy sources, solar spectrum, direct sun power. Major topics spans: photovoltaic Power (potential of solar radiation, pn-junction, pn junction solar cell under illumination , current voltage characteristics of solar cells, equivalent circuit of solar cell , technologies of solar cells, modules, photovoltaic system and Hybrid systems); Indirect sun power (wind power utilization , various wind energy systems, wind turbine generator technology, electrical power systems concepts and grid integration techniques).
Specific Outcomes of Instruction (Course Learning Outcomes):	Course learning outcomes articulated by the course syllabus are as follows: 1) Demonstrate general knowledge of Energy Definition, Energy demand and Energy unit (a) 2) Demonstrate general knowledge of the Energy conversion chain and Energy losses (a) 3) Understand the Green house Effect and Global worming (a) 4) Demonstrate general knowledge of Energy resources (a) 5) Demonstrate general knowledge of Photovoltaic's Fundamentals, Technology and Application (i) 6) Demonstrate general knowledge of Wind Energy system (i) 7) Consider the economic, environmental, social, political, ethical, health and safety impact of their final product, as well as study its manufacturability, and sustainability. (h, j) 8) Design and Simulation of a pv-system or subsystem to meet given specifications (f, g, h,j)
Important material	- Lecture notes - References - Internet resources

References:

1- Renewable Energy, Technology and Environment, Martin Kaltschmitt . Wolfgang StreicherAndreas Wiese,© Springer-Verlag Berlin Heidelberg 2007

2- Understanding Renewable Energy Systems, Volker Quaschning

Carl Hanser Verlag GmbH & Co KG, 2005

3-Principles of Energy Conversion, 2nd edition , by A. Culp, Jr. McGraw-Hill

4-Renewable Energy and climate change, 1st edition 2010, Volker Quaschning, © John Wiley & Sons Ltd Chichester

5- Renewable Energy Power for a sustainable Future, Gogfrey Boyle, Oxford

Major Topics Covered and Schedule in Weeks:

Topic	# Weeks	# Contact hours*
- **Energy Definition and unit** - **Energy conservation** - **Energy forms**	3	9
- **Fossil Energy Resources** - **Nuclear Energy Resources** - **Sustainable or Renewable Energy Resources**	3	9
- **Solar Thermal Energy Conversion** - **Concentrating Solar Thermal Power** - **Geothermal Power**	1	3
Photovoltaics Fundamentals, Technology and Application	4	12
- **Wind Energy Conversion**	2	6
Projects Discussion .	3	9
Total	**15**	**45**

Course Policy

- If you miss class, there won't be a makeup test, quiz, etc. and you WILL get a zero unless you have a valid excuse.
- Cheating and plagiarism are completely prohibited.
- If you miss more than 15% of classes you will autmoatically fail the class

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	
(f)	An understanding of professional and ethical responsibility	***M***
(g)	An ability to communicate effectively	***M***
(h)	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	***L***
(i)	a recognition of the need for, and an ability to engage in life-long learning	***L***
(j)	A knowledge of contemporary issues	***H***
(k)	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	

H=High, **M**= Medium, **L**=Low