

Undergraduate Handbook

Department of Alternative Energy Technology



Philadelphia University
Amman – Jordan

Last Updated: **September 2020**

Table of Contents

- **Contact Information**
- **Introduction**
- **Renewable Energy Engineering Department**
- **Faculty Members**
- **Renewable Energy Engineering Curriculum**
- **Renewable Energy Engineering Department facilities**
- **Student Advising**
- **Quality Assurance**
- **Honors and Awards**

Contact Information

**Department of Alternative Energy Technology
Philadelphia University**

P.O.Box: 1

Amman, 19392

Jordan

Tel: ++ 962 4799000x 2213

Important websites

- **Admission and Registration information**

<http://www.philadelphia.edu.jo/admissions>

<http://www.philadelphia.edu.jo/arabic/admission.asp>

- **Department of Renewable Energy Engineering**

<http://www.philadelphia.edu.jo/faculties/faculty-of-engineering/renewable-energy-engineering>

- **Deanship of Student affairs**

http://www.philadelphia.edu.jo/university/index.php?option=com_content&task=view&id=134&Itemid=144

Introduction

History

Philadelphia University was established in 1989 as a private, accredited university in Jordan. The faculty of Engineering was established in 1991, and has graduated more than 450 engineers, who are working inside Jordan and abroad. The faculty of Engineering comprises the following departments:

- Alternative Energy /technology
- Electrical Engineering
- Mechanical Engineering
- Communications and Electronics Engineering
- Mechatronics Engineering
- Architectural Engineering
- Civil Engineering
- Renewable Energy Engineering

The faculty of Engineering is housed in several buildings with a total area of 5400m², and has 37 specialized and highly equipped laboratories. The total number of engineering students is more than 1600 students.

Mission Statement

As a distinguished academic institution, Philadelphia University commits itself to becoming a full partner in the development of both Jordanian society and other societies at the regional and global levels. The role of science, technology, information and means of communication is becoming absolutely vital to the well-being of humanity. In the coming few years, this role is bound to become a decisive engine of growth. High-quality relevant education, supported by problem-oriented, inter-disciplinary and inter-institutional research, is the only means of leading any society to become an active and productive partner in human civilization.

The speed of globalization and the collapse of cultural and economic barriers require modern education, e-learning and interactive systems to be rooted in democratic interaction, human rights, complete freedom of thought and greater creativity by the younger sectors of society.

As the rapid development of knowledge, science and technology could widen the cultural divide between generations and society, modern approaches to education and lifelong interactive learning will be indispensable in alleviating the effects of this trend.

Carrying a revered name, with deep roots in history, of a major city of the Despoils on the King Road linking old civilizations, Philadelphia University is committed to moving forward, through the twin engines of quality and modernity, along the information highway. It hopes to make a strong bond between knowledge, learning and modern civilization.

The keynote here is proper, fast-developing and morally charged education. Young men and women are the vehicle that launches societies into a future propelled by quality education to prosperity and innovation. Philadelphia University and its sister institutions will be instrumental in bringing this about.

Alternative Energy Technology Department

Overview

Renewable energy technology is a bachelor program in renewable energy technology intended for post-secondary students interested in developing and sustaining resources and technologies that expand energy options for the world economy and the. It is created on the basis of fundamental and engineering sciences with a special focus, during late stages of the program, on the various alternative energy systems with an applied technical perspective including solar electrical as well as solar thermal energy technologies, wind energy, bio energy, geo energy, oil shale, and waste management. This is to meet the need of local, national and international market in the field of alternative energy technologies.

Vision:

To be a distinctive in the field of engineering study and scientific research in all areas of alternative energy technology in accordance with accredited standards nationally as well as internationally in addition to building collaboration bridges with local communities.

Mission

To graduate engineers equipped with theoretical as well as practical knowledge to install, operate and maintain alternative energy systems and to play a vital pioneering role in the area of alternative energy technology suitable for national, regional and global situation.

Faculty Members

The Alternative Energy Technology Department includes the following full time faculty members:

	Photo	Name	Rank	Website
1		Firas Obeidat	Assistant professor	
2		Wagah Faraman	Professor	
3		Mohamed Abu Naser	Assistant professor	
4		Afrah Alkhalilani	Assistant professor	
5		Nadia Badarneh	Lecturer	

Alternative Energy Technology Curricula

Overview

Due to limited supply of hydrocarbon fuel and the global warming problem, there is currently an increasing demand to apply alternative energy technologies. The aim of the Alternative energy technology department is to graduate qualified Engineers in Alternative energy technology systems such as the solar, wind, geothermal and biogas powers and others that will satisfy the need of local and regional market in this field. Students at Alternative energy technology department / Faculty of Engineering / Philadelphia university will be qualified to obtain B.S degree in Alternative Energy Technology. Students will study courses in electrical engineering, power conversion, mechanical engineering, and Alternative energy technologies and essentials.

The Alternative Energy technology curricula at Philadelphia University consist of 132 credit hours (Cr.Hs). Out of the 132 CHs, there are 27 CrHs that are university requirements, 27 CrHs that are faculty compulsory requirements, and 78 CHs that are department requirements. Grades at Philadelphia University are given in percentages (out of 100). A student is supposed to pass the courses with an accumulative grade point average of **60%** to graduate. A detailed grade description can be found at the admissions office website.

Program Educational Objectives

The program of alternative energy technologies targets concocting qualified engineers theoretically as well as practically in area of installing, operating and maintaining alternative energy systems. This can be gained by achieved the following objectives:

- Understand the various forms of conventional energy resources.
- Learn the present energy scenario and the need for energy conservation
- Explain the concept of various forms of renewable and alternative energy technologies.
- Outline and utilization of renewable energy sources for both domestics and industrial application
- Analyze the environmental aspects of alternative energy technology systems.

Alternative Energy Technology Curricula 2017-2018

Philadelphia University
Faculty of Engineering and Technology

Alternative Energy Technology Department
(2018-2019)
Total Credit Hours(132) Hrs.



Approved on Feb. 25th 2020

First: University Requirements (27) Cr.H.
A. First Field: University Compulsory Requirements: (15) Cr.H.

Course No.	Course Title	Cr.H.	Prerequisite
114101	Arabic Language Skills (1)	3	114099
111100	Military Science	3	---
130101	English Language Skills (1)	3	130099
130102	English Language Skills (2)	3	130101
111101	National Education	3	---
111000	Student Community Service	0	---

B. University Elective Courses (12) Cr.H.
The student studies 12 credit hours from the table below:

Course No.	Course Title	Cr.H.	Prerequisite
140111	Language Skills (1)	3	---
140112	Language Skills (2)	3	---
111133	Human Vision & Civilization (1)	3	---
420143	Legal Culture	3	---
430140	Human Rights	3	---
330111	Introduction to Project Management	3	---
731102	Social Networking Skills	3	---
910102	Health Education	3	---
780101	Connectivity&Communications Skills	3	---
610230	Entrepreneurship and Creativity	3	---
240152	Environmental Culture	3	---
111112	Introduction To Psychology	3	---

Notes:
All students must take level examinations in Arabic Language, English language and Computer skills. Student who fails to pass in any examinations (less than 50 %) must successfully pass the remedial course which He / She did not pass.

Codes used in Curriculum:

(610) Electrical Eng.	(620) Mechanical Eng.
(611) Renewable Energy Eng.	(615) Alternative Energy Technology
(630) Computer Eng.	(640) Mechanics Eng.
(650) Communications & Electronics Eng.	(660) Architectural Eng.
(670) Civil Eng.	

Second: Faculty Requirements: (27) Cr. Hr.

Course No.	Course Title	Cr.H.	Prerequisite
250101	Calculus (1)	3	---
250102	Calculus (2)	3	250101
211101	General Physics (1)	3	---
211102	General Physics (2)	3	211101
212101	General Chemistry (1)	3	---
660131	Manual Engineering Drawing	1	---
660132	Computer Engineering Drawing	1	660131
620171	Engineering Workshop (1)	1	660132
630263	Programming Language	3	---
640255	Engineering Skills	3	130102
610550	Entrepreneurship	3	640253

Third: Department Requirements (106) Cr.H.
A. Compulsory Requirements: (85) Cr.H.

Course No.	Course Title	Cr.H.	Prerequisite
615211	Principles of Electrical Circuits	2	211102
615212	Principles of Electronic Circuits	2	615211
615311	Sensors and measurements tools	2	615212
615312	Automatic Control Systems	2	615311
615313	Electrical Machines	2	615311
615314	Electrical Power System	2	615313
615221	Statics	2	211101+250102
615222	Dynamics	2	615221
615223	Fluid Mechanics	2	250102+615222
615224	Thermodynamics	2	211102+250102
615261	Fluid and Thermal Lab	2	615223+615224
615261	Heat transfer	2	615224
615322	Strength of Materials	2	615221
615331	Internal and External Combustion	2	615321
615332	Energy Conversion	2	615321
615333	Power Plant Station	2	615314

B. Compulsory Support Requirements: (15) Cr. Hr.

Course No.	Course Title	Cr.H.	Prerequisite
615341	Solar Thermal Energy	2	615321
615342	Photovoltaic Energy System	2	615321
615431	Energy Economics and Management	2	615332
615432	Traditional Energy Resources	3	615332
615433	Traditional Energy Constraints	2	615432
615462	Power System Simulation and Modeling Lab.	1	615342
615434	Environmental Pollution	2	615331
615441	Nuclear Energy	2	615432
615442	Oil Spill	2	615432
615463	Alternative Energy Workshop (1)	2	615341+615432+9
615444	Wind Energy	2	615224+615313
615464	Alternative Energy Workshop (2)	1	615444(*)
615445	Hydraulic and Geothermal Energy	2	615223+615321
615446	Bioenergy Systems and Waste Management	2	615432
615447	Energy Conservation and Saving	2	615332
615448	Other Renewable Energy Resources	2	Dipl. Approv
615481	Technology Project (1)	1	90 CHrs
615482	Technology Project (2)	2	615481
615480	Training	2	90 CHrs

مدرسة كلية الهندسة
16.09.2020

Alternative Energy Technology Course Description

Course No.	Course Title	Cr H.	Prerequisite	Course Description
615211	principles of Electric Circuits	2+ 1	Applied Physics (2)	Definitions, Basic Concepts; Charge, Current, Voltage, Power, Energy. Circuit Elements Kirchhoff's laws. Mesh and Nodal Circuit Analysis. Network Theorems (Thevenin, Norton, and superposition). Introduction to AC Circuits. Experimental work: DC current circuits, Kirchhoff's laws, networks theorems, power measurement
615313	Electric Machines	2+ 1	principles of Electric Circuits	Single phase and three phase Induction motors, Single phase and three phase Transformers. AC Generators. Three-Phase Synchronous Generators. AC Series Motor. Repulsion Motor. Experimental work: DC transformers, generators and motors. Single phase and three phase Synchronous motors and generators. AC Series Motors.
615311	Instrumentation and Measurement	2+ 1	Principles of electronic circuits	Applications of Electrical and Mechanical Sensors. Data Acquisition and Applications of Logic Controllers in Power Systems. Identify the Physical Information Needed to Control and Record Data. Methods of Calibration and Correction. Experiments on: Oscillations. Measurement of Ground Resistance. Data Acquisition. Signal Generators. Overlap and Isolation. Open and Closed-Circuit Systems. Speed feedback on system Performance. Frequency Response Measurements.
615312	Automatic Control Systems	2	Instrumentation and Measurement	Introduction to Feedback Systems. Review of System Equations. Block Diagram and Signal Flow Graphs. Time Response of Systems and Closed Loop Performance. Routh's Stability Criterion. The Root Locus Method. Frequency Methods. Compensation Techniques. Introduction to Sampled Control Systems. Computer Control Systems.
615212	Principles of electronic circuits	2+ 1	principles of Electric Circuits	Semiconductor Circuit Analysis. Full Wave and Half Wave Semiconductor Diodes Rectifiers. Zener Diodes, Clippers, Clampers. Bipolar Junction Transistor (BJT), Biasing Circuits. Common Emitter Amplifier.

				Common Collector Amplifier. Common Base Amplifier. Design of BJT Amplifier. Field Effect Transistor (FET): JFET & MOSFET. JFET Amplifiers. Design of JFET Amplifier. Introduction to OP-AMP & Its Applications. Experimentation on:
615221	Statics	2	Applied Physics (1)	Introduction to Mechanics of Rigid Bodies. Basic Principles in Forces and Vectors Analysis, forces Systems, Equivalent forces Systems, Static Equilibrium, Simple Structures Analysis, Friction, Geometric Properties, Centroids and Moments of Inertia.
615222	Dynamics	2	Statics	Kinematics of Particles. Rectilinear and Curvilinear Motion in Various Coordinate Systems. Kinetics of Particles. Newton's Second Law. Central Force Motion. Work-Energy Equation. Principle of Impulse and Momentum. Impact, Conservation of Energy and Momentum. Application to a System of Particles. Kinematics of Rigid Bodies. Relative Velocity and Acceleration. Instantaneous Center, Analysis in Terms of a Parameter. Plane Kinetics of Rigid Bodies with Application of Newton's Second Law. Energy and Impulse-Momentum. Vibrations.
615223	Fluid Mechanics	2	Calculus II	Hydrostatics, steady and unsteady flow, continuity equation, ideal uncompressed flow, one dimensional Euler's and Bernoulli's Equations. Energy equation, Momentum Principle. Dimensional Analysis, Introduction to Boundary Layer Theory. Flow in Conduits, Frictional and Minor Losses in Piping Systems.
615224	Thermodynamics	2	Fluid Mechanics	Thermodynamic Concepts and Definitions. Pure Substances. The First and second laws of thermodynamics. Control volumes and cycles analysis.
615261	Thermo fluids lab	1	Thermodynamics	Experimentation on topics covered in the courses of heat transfer and fluid mechanics.
615321	Heat transfer	2	Thermodynamics	Introduction to Modes of Heat Transfer; One-Dimensional Steady State Conduction, Unsteady State Thermal Conduction. Lumped Heat Capacity System. Convection Heat Transfer. Empirical and Practical Relations for Convection Heat Transfer. Free Convection

				Heat Transfer. Condensation and Evaporation. Introduction to Heat Exchangers. Introduction to Thermal Radiation.
615322	Strength of materials	2+ 1	Statics	The concept of Stresses and Strains. Stresses due to Axial Loading. Material Properties Obtained from Tensile Tests. Thermal Stresses. Elementary Theory of Torsion, Stresses in Beams Due to Bending, Shear and Combined Forces. Composite Beams, Combined Stresses. Deflection of Beams, Buckling of Columns.
615331	Internal and external combustion	2+ 1	Heat transfer	Steam power cycles. Types of internal combustion engines, spark ignition machines, Compression ignition engines, turbines and external compression engines, air pollution.
615314	Electrical power systems	2	Electrical machines	System representation, parts of power systems, generators, power transformers, transmission lines, failure analysis.
615332	Energy conversion	2	Electrical power systems	Energy forms, energy needs and energy available sources; such as Fossil Fuels, oil shale, hydrogen, hydroelectricity, biomass principles of nuclear energy, solar energy, wind, Geothermal, and Ocean. Conversion of chemical energy into thermal energy, conversion of thermal energy into mechanical and electrical energy using heat engines and electrical generators, energy conversion through fuel cells.
615431	Energy economics and management	2	Energy conversion	Principles of Energy Management. Energy Conservation. Energy Auditing and Analysis. Formulation of Energy Management Options. Economic Assessment and Conservation Technology of Energy. Energy Saving in Big Industries. Steam Generation. Electric and Distribution Energy Systems Management. Integral Planning for the Resources. Demand Management. Cogeneration. Total Power Schemes. Thermal Insulation. Energy Storage.
615432	Conventional energy problems and constraints	2	Energy conversion	Forms and availability of conventional energy, economic impacts of conventional energy sources, sustainability within conventional energy sources, transportation and distribution of conventional energy sources, environmental impacts of conventional energy.
615462	Modeling and	1	Conventional	Experimentation on simulation definition,

	simulation of energy systems lab.		energy problems and constraints	principles of physical systems; electrical, hydraulic, thermal, and mechanical. Simulation techniques using computers and simulation packages and their applications in conventional and alternative energy systems.
615333	Power plants	2	Electrical energy systems	Thermal cycles, steam generators, steam condensers, steam turbines. Load manipulation, economics of power plants.
615434	Energy environment impact	2	Internal and external combustion	Applications of Chemistry and Engineering Fundamentals to Understand Environmental Concepts Related to Human Activities. Mass and Energy Transfer. Environmental Chemistry for Water and Air Pollution. Pollution Management and Hazard Evaluation. Introduction to Chemical. Physical and Biological Related to Quality of Water. Air and Earth Environment. Parameters That Effect Energy Consumption and Building Utilization. Basic Resources and Utilization of Energy. Energy Conversions. Distribution and Utilization of Electricity and Heat. Environment Impact of Energy Technology.
615441	Nuclear Energy	2	Applied physics (2)	Introduction to nuclear energy and its use, environmental impact of nuclear energy, threats associated with the use of nuclear energy, measures and codes of nuclear energy utilization.
615442	Oil shale	2	Applied physics (2)	Introduction to oil shale, oil shale composition, types of oil shale, oil shale utilization methods, global potential of oil shale, ways of extraction, economic viability, environmental impact of oil shale utilization.
615341	Solar thermal energy	2	Heat transfer	Introduction to Solar Thermal Energy. Residential. Commercial and Industrial Applications. Solar Radiation. Heat Transfer. Plane and Concentrated Collectors. Water Heating Applications. Heating and Cooling the Buildings. Thermal Industrial Applications Water Desalination. Solar Thermal Energy System.
615342	Photovoltaics systems	2	Electrical power systems	Overview on functioning of the Photovoltaic principles. Stand alone and grid tied photovoltaic System. Cell as well as system efficiencies. Photovoltaic system components: Batteries, modules, charge

				controllers, power Factor. Power inverters.
615463	Alternative energy workshop (1)	1	Photovoltaic systems	PV modules installation of standalone and grid tied systems, balance of systems components, use of tools and test instruments for the installation of PV systems, PV system troubleshooting and maintenance procedures.
615464	Alternative energy workshop (2)	1	Solar thermal energy	Solar thermal energy systems installation, flat plate and concentrated solar thermal collectors, the application of water heating, space heating and cooling, thermal industrial processes, water desalination.
615444	Wind energy	2	Electrical machines	Historical Applications of Wind Energy. Basic Concepts of Wind Energy Converters. Physical Principles of Wind Energy Conversion. Types of wind turbines; vertical and horizontal axis turbines. Aerodynamics of Turbines. Using Computer Software for Wind Energy Analysis.
615446	Bioenergy and waste management	2	Conventional energy sources	Introduction to Biomass Energy. Bioenergy systems. Organic Materials (Plants etc.). Biomass Energy. Waste power. Transfer of Solid Material into gas, Gas collection Technologies. Burning and Digestion of Wet Wastes. Biomass as a Source of Renewable Energy.
615447	Rational use and conservation of energy	2	Energy conversion	Principles and techniques for rational use of energy, ways for energy consumption analysis, implementation of energy conservation measures; building insulation, double glazing windows, passive cooling systems.
615448	Other alternative and renewable energy systems	2	Department approval	Hydrogen and fuel cells, wasted heat, hydroelectric and wave energy, tidal energy.
615445	Hydro and geothermal energy	2	Thermodynamics	Introduction to Heat Transfer. Geothermal Resources. Heat Transfer Mechanisms. Different Heat Exchange Systems. Thermodynamics principles for Design and Control of Heating and Cooling Systems. Fluids and Fluid Flow. Hydraulic and Air System Implementations. Installation and Modeling of Principles of Performance. Function and Applications of Hydraulic and Air Component, Valves, Cylinders and

				Pumps. Linear and Circular Motion Control Circuits. Design Principles and Implementation in Hydraulic and Air Systems. Systems and Devices of Hydraulic Energy Generation. The Transfer and Control of Energy. Drawing and Installation of Circuit and Hydraulic Systems. Performance Improvements for the Systems in Industrial Processes.
615480	Field training	0	90 credit hours	The Student must Spend Eight Weeks after Completing 90 Credit Hours in the Industry (Inside or Outside Jordan) Under the Supervision of a faculty Member in the Department. The Student is Required to Submit Periodic Reports, Final Reports and Final Exam. This will be in a separate semester that is not synchronized with the study
650481	Technological project (1)	1	90 credit hours	The Student Must be Associated with one or more Faculty Members from the Department where a Project is Assigned to him. The Student will Study the Project, analyze it and Submit a Proposal for its Implementation in the Next Stage.
650482	Technological project (2)	2	Technological project (1)	The Student Carries Out the Project Suggested by the department Based on the Results Obtained from Engineering Project (1).
615251	Drawing and read of engineering plans	2	Engineering drawing by computer	Principles, methods, and techniques for engineering plans drawing and reading. Bodies representation on plane surfaces, symbols drawing details.
615351	Professional safety	3	Drawing and read of engineering plans	Role of worker in economic development. Administrational hierarchy. Industrial accents management. Protection and safety equipment. Understanding and preventing fires. Electrical shocks and their treatment. Storage of chemical materials. Jordanian work law. Jordanian social security law.
615352	Material science	3	Strength of materials	Metal structures and crystallization, Materials used in engineering applications, Plastic deformation on the macro and micro-structure levels. Material failure, Heat treatment processes, Phase diagrams, Heat treatment of steel.

Advisement Plan for Alternative Energy Technology Department

First Year							
First Semester				Second Semester			
Course No.	Course Title	Cr. H.	Prerequisite	Course No.	Course Title	Cr. H.	Prerequisite
114101	Arabic Language Skills (1)	3	114099	111101	National Education	3	----
130101	English Language Skills (1)	3	130099	130102	English Language Skills (2)	3	130101
250101	Calculus (1)	3	-----	250102	Calculus (2)	3	250101
211101	Applied Physics (1)	3	-----	----	Military sciences	3	----
620131	University elective	3	-----	211101	Applied Physics (2)	3	211101
660131	Engineering Drawing	1	-----	660131	Engineering Drawing by computer	1	660131
Total		16		Total		16	

Second Year							
First Semester				Second Semester			
Course No.	Course Title	Cr. H.	Prerequisite	Course No.	Course Title	Cr. H.	Prerequisite
615211	Electric Circuits	2+1	211102	615251	Drawing and reading of engineering plans	2	660132
640253	Engineering skills	3	130102	615212	Electronic circuits	2+1	615211
615221	Statics	2	211101	615313	Electrical Machines	2+1	615211
615223	Fluid mechanics	2	250102	615222	Dynamics	2	615221
620171	Engineering workshop (1)	1	660132	615224	Thermodynamics	2	615223
212101	General chemistry (1)	3	-----	615322	Strength of materials	2+1	615221
	University elective	3	-----	630263	Programing language	3	-----
Total			17	Total		18	

Third Year							
First Semester				Second Semester			
Course No.	Course Title	Cr. H.	Prerequisite	Course No.	Course Title	Cr. H.	Prerequisite
615311	Instrumentation and Measurement	2+1	615212	615312	Automatic control systems	2	615311
615314	Electrical power systems	2	615313	615331	Internal and external combustion	2+1	615321
615321	Heat transfer	2	615224	615332	Energy conversion	2	615314
615351	Professional safety	3	615251	615333	Power plants	2	615314
	University elective	3		615442	Oil shale	2	211102
615261	Thermo fluids lab	1	615224	615444	Wind energy	2	615313
				615341	Solar thermal energy	2	615321
				615352	Material science	3	615322
Total		16		Total		18	

Third Year			
Summer Semester			
Course No.	Course Title	Cr. H.	Prerequisite
615480	Engineering training	0	90 Cr. H.

Fourth Year							
First Semester				Second Semester			
Course No.	Course Title	Cr. H.	Prerequisite	Course No.	Course Title	Cr. H.	Prerequisite
615432	Conventional energy sources	3	615332	615447	Rational use and conservation of energy	2	615332
615433	Conventional energy problems and constraints	2	615332	615446	Bioenergy and waste management	2	615432
615434	Environmental pollution	2	615331	615448	Other renewable and alternative sources	2	
615342	Photovoltaics	2	615314	615462	Modeling and simulation of energy systems	1	615433
615445	Hydro and geothermal energy	2	615222	615464	Alternative energy workshop (2)	1	615342
615431	Energy economics and management	2	615332	610550	Engineering enterpenoring	3	640253+120 Cr Hrs
615463	Alternative energy workshop (1)	1	615341	615482	Technological project (2)	2	615481
615481	Technological project (1)	1	90 Cr Hrs		University elective	3	-----
Total		16		Total		15	

Department Facilities

Department Laboratories

The following laboratories are the corner stone of the department where students get exposed to the latest equipment used in the design, implementation and troubleshooting of modern Technology related to Alternative Energy Technology.

Solar Energy Lab (611526)

PV Modules installation of standalone and grid tied systems, balance of systems components, use of tools and test instruments for the installation of PV systems, PV system troubleshooting and maintenance procedures.

Solar thermal energy systems installation, flat plate and concentrated solar thermal collectors, the application of water heating, space heating and cooling, thermal industrial processes, water desalination

Wind Energy Lab (611536)

Study of the Conversion of Kinetic Wind Energy into Electrical Energy. Study of the Conversion of Kinetic Wind Energy into Electrical Energy. Determination of the Typical Parameters of The Aerogenerator (Short Circuit Current, Open-Circuit Voltage, Maximum Power), and I-V Curve. Study of Voltage, Current and Power in Function of Different Loads and the Influence of the Load Variation on the Aerogenerator. Study of the Power Generated by the Aerogenerator Depending on the Incident Angle of the Air. Study of The Aerogenerator Operation in Function of the Blade Configuration (Aerogenerator with 6, 3 Or 2 Blades), and the Optimum Number of Blades. Study of the Efficiency of a Wind Power Unit. Study of the Connection of Loads to Alternating Voltage of 220V. Study of the Inverter Connected to the Grid Simulator.

Technology Incubators

“Economic and social development cannot be achieved in the absence of initiative and creativity, or in the presence of fear of change”

His Majesty King Abdullah II

The Jordan Innovation Center (JIC) at Philadelphia University is a new type of Business Incubators to be launched in Jordan to provide support and development of new innovative technical and business ideas. It supports innovative projects in any discipline provided that it has a potential for commercial use.

A Business Incubator provides “a unique and highly flexible combination of business development processes, infrastructure and people, designed to nurture and grow new and small businesses by supporting them through the early stages of development and change.” (UKBI)

Business Incubators are a powerful economic development tool used extensively in Europe and the USA with around 4000 in existence worldwide today. The JIC at Philadelphia University intends to replicate this success within the Jordanian economy.

The Renewable Energy Engineering Department at Philadelphia University has direct interactions with the Business Incubator at the university.

Student Advising

The definition of academic advising is based on the interaction between the engineering student and his/her advisor until the required courses within his/her curricula is taken.

The student has to know the following:

- Each student in the Faculty of Engineering is assigned an academic advisor by the department. The advisor is responsible for advising what courses are chosen for registration. This should be performed at the beginning of every semester.
- The student has to take the following points into consideration regarding the registration process:
 - o Making sure that he/she passed the relevant prerequisite courses (refer to Computer Engineering Curricula)
 - o Following the sequence of registration steps shown in the study plan, which are as follows:
 - University requirements: compulsory courses and electives.
 - Faculty requirements: compulsory and electives.
 - Specialty requirements.
 - o Consulting the study plan during the registration process in respect of the number of credit hours a student can take per semester.
 - o As the academic advising process is not compulsory, the student can register for classes without taking the advisor's comments into consideration, but he/she will take full responsibility for this action and its consequences since this might delay his/her graduation.
- The student must understand that he/she has to register for a minimum of 12 credit hours and a maximum of 18 in regular semesters.
- The student has the right to withdraw (drop) from a course or more during a certain semester provided that he/she remains registered for at least 9 credit hours. This withdrawal (drop) must be approved by the course professor and the academic advisor. The withdrawal (drop) should take place during a specific period of time that is set by the Admission and Registration Department. There is a specific period within which the student can get a refund for the course fees, after this period the student will lose his/her right to get the refund.
- The student can add/drop courses only in accordance with the admission and registration office time table. The student is allowed to add/drop a limited number of courses as per the regulations set by the Admissions and Registration Department.

Quality Assurance

Philadelphia University was ranked the first leading all public and private universities in Jordan in the quality assurance measures set by of the Hussein Fund for Creativity and Excellence for the Faculties of Information Technology and Law. The university has set and demonstrated the highest quality assurance measures in teaching, management and research development that attracted the attention of domestic and foreign institutions.

In the Alternative Energy Technology Department, the highest measures of quality assurance are being adopted to raise the level of teaching standards, and implement clear measures for teaching, advising, senior project organization, testing and course assessment. This is put in a feedback system that helps the department hear the comments from the students and allow them to evaluate both courses and instructors. This of course increases the level and quality of teaching as well as information delivery.

Both, the mission of the department and its objectives stress on the implementation of the highest quality measures and regulations to provide the best learning experience to our students. (*See department mission in the Computer Engineering Department mission section*)

Honors and Awards

Philadelphia University and the Alternative Energy Technology Department promote and encourage students to excel in their studies through the introduction of various awards and honor lists that reflect the hard work of our students and encourage them to keep it up.

These awards are listed on the University Admission site (<http://www.philadelphia.edu.jo/admission.asp>). Also, an annual honor list is published and engraved on the entrance of the Faculty of Engineering that highlights the names of the honor students from each engineering discipline.