Undergraduate Handbook

Department of Alternative Energy Technology

Philadelphia University
Amman – Jordan

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Contact Information

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Important websites

- **Admission and Registration information**

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

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

- **Department of Alternative Energy Technology**

  https://www.philadelphia.edu.jo/faculties/faculty-of-engineering/alternative-energy-technology

- **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 its name was changes to the Faculty of Engineering and Technology in 2018 due to the inception of the Alternative Energy Technology Department in that year. The faculty of Engineering and Technology 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 and Technology is housed in several buildings with a total area of $5400m^2$, and has 38 specialized and highly equipped laboratories.

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

The Alternative Energy Technology Department at Philadelphia University started Accepting students in the academic year 2018/2019. The department has 5 faculty members with unique experience in various areas of alternative energy technology, including but not limited to solar PV, solar thermal, wind, nuclear, hydrogen, and biomass. Our faculty members graduated from globally ranked foreign institutions. The faculty to student ratio in the department is about 1:10, which will provide the students with more time to share with their respective faculty members to enhance the quality of learning. The department has 3 laboratories that are dedicated to exposing students to the latest technologies in the subjects taught. Each laboratory is supervised by a faculty member, and is run by an experienced engineer.

Vision:

To be distinctive in the field of teaching 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:

Alternative Energy Technology Program mission statement is:

1- Prepare Alternative Energy graduates for a career with a wide range of opportunities in design, development and, management.
2- Promote intellectual, ethical and technological aspects of the student.
3- Actively contribute, improve and sustain an environment of continuous learning with the professional ability for technological applications in local market taking in to account all possible technical, economic, and environmental constraints.

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Faculty Members

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

	Name	Rank	Website
1	Firas Obeidat	Assistant professor Department head	https://www.philadelphia.edu.jo/academics/fobeidat/
2	Jasim Ghaeb	Professor	https://www.philadelphia.edu.jo/academics/jghaeb/
3	Mohamed Abu Naser	Assistant professor	https://www.philadelphia.edu.jo/academics/mnaser/
4	Yara Haddad	Assistant professor	https://www.philadelphia.edu.jo/academics/yhaddad/
5	Nadia Badarneh	Lecturer	https://www.philadelphia.edu.jo/academics/nbadarneh/

Overview

Due to limited supply of hydrocarbon fuel and the global worming problem, there is currently an increasing demand to apply alternative energy technologies. The aim of the Alternative energy technology department is to graduate qualified technologists who are specialized in Alternative Energy 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 and Technology/ Philadelphia University will be qualified to obtain bachelor 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. Hrs). Out of the 132 Cr. Hrs, there are 27 Cr. Hrs that are university requirements, 27 Cr. Hrs that are faculty compulsory requirements, and 78 Cr. Hrs. 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 technologists 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 2021-2022

Philadelphia University
Faculty of Engineering and Technology

Alternative Energy Technology Department
(2021-2022)
Total Credit Hours (132) Hrs.

First: University Requirements (27) Cr.H.

A. First Field: University Compulsory Requirements: (18) Cr.H.

Course No.	Course Title	Cr.H.	Prerequisite
0111100	Military Science	3	---
0111101	National Education	3	---
0114103	Connectivity & Communications Skills (Arabic Language Skills1)	3	114099
0130107	Connectivity & Communications Skills (English Language Skills 1)	3	130099
0130108	Connectivity & Communications Skills (English Language Skills 2)	3	130107
0330103	Entrepreneurship and Creativity	1	---
0115102	Leadership and social responsibility	1	---
0170101	Life skills	1	---

B. University Elective Courses (9) Cr.H.

The student studies 9 credit hours from the table below:

Course No.	Course Title	Cr.Hr.	Prerequisite
0170102	Thinking Skills (1)	3	---
0111133	Human Vision & Civilization (1)	3	---
0140111	Language skills (1)	3	---
0140112	Language skills (2)	3	---
0670101	Development and the environment	3	---
0330111	Introduction to Project Management	3	---
0420140	Human legal	3	---
0420143	Legal culture	3	---
0320104	Economic culture	3	---
0750101	Digital culture	3	---
0750102	Data analysis skills	3	---
0910102	Healthy culture	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 Curriclum:

(610) Electrical Eng. (620) Mechanical Eng.
(611) Renewable Energy Eng. (615) Alternative Energy Technology
(630) Computer Eng. (640) Mechatronics 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	---
610263	Programming Language	3	---
640253	Engineering Skills	3	130108
610550	Engineering Entrepreneurship	3	640253

Third: Department Requirements (78) Cr.H.

A. Compulsory Requirements: (69) Cr.H.

Course No.	Course Title	Cr.H.		Prerequisite
615211	Principles of Electrical Circuits	2	1	211102
615212	Principles of Electronic Circuits	2	1	615211
615311	Sensors and measurements tools	2	1	615212
615312	Automatic Control Systems	2	-	615311
615313	Electrical Machines	2	1	615211
615314	Electrical Power System	2	-	615313
615225	Mechanics (Statics and Dynamics)	3	-	211101+250102
615226	ThermoFluid	3	-	250102+615225
615261	Fluid and Thermal Lab.	-	1	615226
615323	Heat transfer	3	-	615226
615322	Strength of Materials	2	1	615225
615331	Internal and External Combustion	2	1	615323
615334	Energy Storage and Conversion	3	-	615323
615333	Power Plant Station	2	-	615314

Course No.	Course Title	Cr.H.		
615343	Solar Thermal Energy	3	-	
615344	Photovoltaic Energy System	3	-	
615435	Energy Economics and Management	3	-	
615432	Traditional Energy Resources	3	-	
615462	Power System Simulation and Modeling Lab.	-	1	
615434	Environmental Pollution	2	-	
615436	Nuclear Energy	3	-	
615437	Oil Shale	3	-	
615463	Alternative Energy Workshop (1)	-	1	6
615443	Wind Energy	3	-	6
615464	Alternative Energy Workshop (2)	-	1	
615449	Other Renewable Energy Recourses	3	-	6
615481	Technology Project (1)	1	-	
615482	Technology Project (2)	2	-	
615480	Training	-	-	

B. Compulsory Support Requirements: (9) Cr. Hr.

Course No.	Course Title	Cr.H.	
615353	Reading and Drawing Sketches	3	-
615351	Occupational safety	3	-
615352	Materials Science	3	-

- ***concurrent***

Course No.	Course Title	Cr. Hrs.	Prerequisite	Course Description
615211	Principles of Electric Circuits	2+1	General 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:
615225	Mechanics (Statics+Dynamics)	3	General Physics (1) + Calculus (2)	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. 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.
615226	Fluids and Thermal Sciences	3	Mechanics + Calculus 2	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. Thermodynamic Concepts and Definitions. Pure Substances. The First and second laws of thermodynamics. Control volumes and cycles analysis.
615261	Fluids and Thermals lab	1	Thermodynamics	Experimentation on topics covered in the courses of heat transfer and fluid mechanics.

615323	Heat transfer	3	Fluids and Thermal Sciences	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	Mechanics	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.
615334	Energy conversion and storage	3	Heat transfer	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.
615435	Energy economics and management	3	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 sources	3	Energy conversion and storage	Forms and availability of conventional energy sources, like coal, oil, and gas. Economic and environmental impacts of conventional energy sources. Methods of extraction.
615462	Modeling and simulation of energy systems lab.	1	Photovoltaics	Experimentation on simulation definition, 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 power 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.
615436	Nuclear Energy	3	Conventional Energy Sources	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.
615437	Oil shale	3	Conventional Energy Sources	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.
615343	Solar thermal energy	3	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.
615344	Photovoltaics systems	3	Principles of Electronic Circuits	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+Solar thermal energy	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.
615464	Alternative energy workshop (2)	1	Wind energy	Different experiments related to wind energy systems
615443	Wind energy	3	Electrical machines +Fluid and thermal sciences	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.
615449	Other alternative and renewable energy systems	3	Heat Transfer + Fluid and Thermal Sciences	Hydrogen and fuel cells, wasted heat, hydroelectric and wave energy, tidal energy.
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).
615353	Drawing and reading of engineering sketches	3	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.

First Year							
First Semester				Second Semester			
Course No.	Course Title	Cr. H.	Prerequisite	Course No.	Course Title	Cr. H.	Prerequisite
114103	Communication and Contact Skills (Arabic Language)	3	114099	111101	National Education	3	----
130107	Communication and Contact Skills (English Language 1)	3	130099	130108	Communication and Contact Skills (English Language 2)	3	130107
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	------	111100	Military science	3	----
660131	Manual Engineering Drawing	1	------	660132	Computer Engineering Drawing	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	Principles of Electric Circuits	2+1	211102	615353	Drawing and reading of engineering sketches	3	660132
640253	Engineering skills	3	130108	615212	Principles of Electronic Circuits	2+1	615211
615221	Mechanics (Statics + Dynamics)	3	211101	615313	Electrical Machines	2+1	615211
330103	Entrepreneurship and Innovation	1	-----	615222	Leadership and Social Responsibility	1	115102
620171	Engineering workshop (1)	1	660132	615226	Fluids and Thermal sciences	3	615225 +250102
610263	Programming Language	3	-----	615322	Strength of materials	2+1	615221
	University elective	3	-----				
Total			**17**	**Total**		**16**	

Third Year							
First Semester				Second Semester			
Course No.	Course Title	Cr. H.	Prerequisite	Course No.	Course Title	Cr. H.	Prerequisite
615311	Instrumentation and Measurement Tools	2+1	615212	615312	Automatic control systems	2	615311

615314	Electrical power systems	2	615313	615331	Internal and external combustion	2+1	615323
615323	Heat transfer	3	615334	615334	Energy conversion and storage	3	615323
615351	Occupational safety	3	615353		University elective	3	
	University elective	3		615352	Material science	3	615322
615261	Fluids and Thermals lab	1	615226	615443	Wind energy	2	615313 +615226
170101	Life Skills	1					
Total		**16**		**Total**		**17**	

Third Year			
Summer Semester			
Course No.	**Course Title**	**Cr. H.**	**Prerequisite**
615480	Field 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	615334	615436	Nuclear Energy	3	615432
615333	Power plants	2	615314	615437	Oil Shale	3	615432
615434	Environmental pollution	2	615331	615449	Other renewable and alternative sources	3	615226 +615323
615344	Photovoltaics	3	615212	615462	Modeling and simulation of energy systems lab	1	615344
615343	Solar thermal energy	3	615323	615463	Alternative energy workshop (1)	1	615343 +615344
615435	Energy economics and management	3	615334	610550	Engineering entrepreneurship	3	640253
615464	Alternative energy workshop (2)	1	615443	615482	Technological project (2)	2	615481
615481	Technological project (1)	1	90 Cr Hrs				
Total		**18**		**Total**		**16**	

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.

Alternative Energy Workshop 1 (615463)

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

Alternative Energy Workshop 2 **(615464)**

Modeling and simulation of energy systems lab (615462)

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:

    - Making sure that he/she passed the relevant prerequisite courses (refer to Computer Engineering Curricula)
    - 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.
    - Consulting the study plan during the registration process in respect of the number of credit hours a student can take per semester.
    - 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.