

Undergraduate Handbook

CIVIL ENGINEERING DEPARTMENT



Philadelphia University
Amman – Jordan

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Civil Engineering Department

Philadelphia University

P.O.Box: 1

Amman, 19392

Jordan

Tel: ++ 962 6-4799000

Fax:++962 6-4799040

Important websites

Admission and Registration information

http://www.philadelphia.edu.jo/university/index.php?option=com_content&task=view&id=318&Itemid=444

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

Civil Engineering Department

<http://www.philadelphia.edu.jo/faculties/faculty-of-engineering/civil-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 hundreds of engineers, who are working inside Jordan and abroad. The faculty of Engineering and Technology comprises the following departments:

Computer Engineering

Electrical Engineering

Mechanical Engineering

Communications and Electronics Engineering

Mechatronics Engineering

Architectural Engineering

Civil Engineering

Mechatronics Engineering

Renewable Energy Engineering

The faculty of Engineering and Technology is housed in several buildings with a total area of 5400m², and has 35 specialized and highly equipped laboratories. The total number of engineering students is less than 1000 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.

CIVIL ENGINEERING DEPARTMENT

Overview

The Civil Engineering Department at Philadelphia University has about 220 students, which accounts for 25% of the total engineering students in the Faculty of Engineering and Technology. The department has 11 faculty members with unique experience in various areas of civil engineering, who graduated from globally ranked foreign institutions. The faculty to student ratio in the department is about 1:20, which will provide the students with more time to share with their respective faculty members to enhance the quality of learning. The department has 8 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.

Mission

The mission of the Department of Civil Engineering encompasses excellence in undergraduate education, research, and public service. We will do the following:

- Educate the next generation of engineering leaders to formulate and solve complex problems of importance to society, to collaborate as productive team members, to engage in life-long learning, and to act professionally and ethically
- Extend engineering knowledge across the breadth of the discipline and beyond through creative, innovative research ranging from the fundamental to the applied
- Facilitate the understanding and use of new ideas, technologies, and practices for the betterment of society through service and leadership in local, national, and international communities.

Civil Engineering Department Facilities

Department Laboratories

The following laboratories are the corner stone of the Civil Engineering Department where students get exposed to the latest equipments used in the testing and evaluating the physical and mechanical properties of construction materials, fluids, soils, and asphalt. The students also practice surveying in the field with the latest instruments and tools available.

Strength of Materials Lab. (0670213)

Tensile test, compression test, shear test, torsion test, impact test, fatigue test, strain Gauge measurement, creep test, hardness test, application of mechanical load cell, corrosion experiment, examination of material microstructure.

Materials of Construction Lab (0670216)

Normal Consistency & Setting Time of Cement Past; Fresh and Mechanical Properties of Mortar; Sieve Analysis of Aggregate; Specific Gravity of Aggregate; Unit Weight of Aggregate; Abrasion test of Aggregate; Fresh and Mechanical Properties of Concrete; Mechanical Properties of Steel; Tests on wood; Impact Test on Steel; Hardness Test on Metals.

Surveying Lab (0670262)

Pacing and taping, chain surveying mapping, layout of buildings using chain surveying and theodolites, angles measurement and coordinates geometry using theodolites, traverse survey using total stations, running a leveling network using levels, setting out curves by different methods.

Highway Engineering Lab (0670322)

Tests on penetration, softening and flash points, ductility, viscosity, CBR, specific gravity, blending of aggregate, Marshall mix design, extraction, aggregate properties, skid resistance.

Soil Mechanics Lab (0670332)

Water content (Oven drying & Speedy Moisture tester), specific gravity of soil particles, liquid limit and plastic test, Shrinkage limit test (linear & volumetric), consolidation test, dry density & water Relation (Proctor Compacting), dry density in field by sand cone & rubber balloon, California bearing ratio test, permeability of soil (Constant head & falling head), bearing capacity of soil-unconfined test, bearing capacity of soil-tri-Axial test, direct shear test (for sandy soil)

Fluid Mechanics Lab (0670382)

Introduction (density, surface tension and viscosity), flow measurements, impact of jet, open channel flow (sluice gate, weirs, hydraulic jump and Manning formula), losses in pipes, pressure distribution about a circular cylinder, drag force determination, analysis of an airfoil, turbine and pump unit.

Hydraulics Lab (0670442)

Density, specific gravity, viscosity; fluid characteristics; continuity, conservation of energy; fluid behavior: center of pressure, pipe flow, open channel flow; and pump performance.

Sanitary Engineering Lab (0670444)

Volumetric and spectrophotometric analytical methods are used to determine quality parameters of raw water, finished water and wastewater. Parameters tested include alkalinity, hardness, salinity and solids, BOD and COD among others.

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 Civil Engineering Department at Philadelphia University has direct interactions with the Business Incubator at the university, where several senior project designs from the department have been supported.

Faculty Members

The Civil Engineering Department includes the following faculty members:

Dr. Mohammed Mustafa Al-Iessa (Associate Prof.)

Dr. Ahmed J. Dabdab (Associate Prof.)

Dr. Ahmad Alfraihat (Assistant Prof.)

Dr. Mohammad Khairi Younes (Assistant Prof.)

Dr. Ala'a Taleb Obaidat (Assistant Prof.)

Dr. Ala'a Saleh Alshdiefat (Assistant Prof.)

Dr. Sawsan Alkawaldah (Assistant Prof.)

Dr. Mais Maher Al-Dwaik (Assistant Prof.)

Eng. Amany Asooly (Lecturer)

Eng. Abd Allah Odeibat (Lecturer)

Eng. Adnan Abdull Hadi (Lecturer)

Civil Engineering Curriculum

Overview

Civil Engineering is one of the highly progressing disciplines that need to be up to date with state of the art technology. The courses offered by the Civil Engineering Department at Philadelphia University follow the highest standards and the outlines and text books used by top foreign universities. Our faculty members have a broad experience in all aspects of civil Engineering, both in academic and field experience.

The Civil Engineering curricula at Philadelphia University consist of 160 credit hours (CHs). Out of the 160 CHs, there are 27 CHs that are university requirements, 27 CHs faculty requirements, and 106 CHs that are department requirements. Each is divided into sub-requirements as shown in the tables that follow. 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.



اسم الطالب:
الرقم الجامعي:
المعهد الأكاديمي:

الخطة الدراسية لدرجة البكالوريوس في الهندسة المدنية (2019-2018)

جامعة قادسيyah
كلية الهندسة والتكنولوجيا

عدد الساعات المعتمدة: ١٦٠ ساعة معتمدة

العلامة	المتطلب السابق	المتطلب السابق	ساعات المعتمدة	اسم المادة	رقم المادة
	0670381	0670441	3	هندسة ميكانيكا	0670441
	0670441	0670541	3	هندسة ميكانيكا	0670541
	0670441	0670442	1	مختبر الهندسة الصحية	0670442
	0670443	0670444	1	مختبر الهندسة الصحية	0670444
	0670331	0670331	3	خدمة الإسعافات	0670331
	115 م	0670499	3	التدريب الهندسي (**)	0670499
	0670499	0670551	1	مشروع هندسي ١	0670551
	0670551	0670552	2	مشروع هندسي ٢	0670552
	0670211	0670381	3	ميكانيكا الموائع	0670381
	0670381	0670443	3	خدمة صحية	0670443
ب. متطلبات المسادة الإجبارية: (٢٠) ساعة معتمدة.					
العلامة	المتطلب السابق	المتطلب السابق	ساعات المعتمدة	اسم المادة	رقم المادة
	0620171	0620172	1	المسائل الهندسية (٢)	0620172
	0212101	0212102	1	كيمياء عملة علي (١)	0212102
	0250102	0250202	3	فناصل وتكامل (٣)	0250202
	0250202	0250205	3	الجبر الخطي والتكامل المتجهي	0250205
	0250102	0650260	3	تحليل هندسي (١)	0650260
	0650260	0630262	3	تحليل هندسي (٢)	0630262
	0670211	0620212	3	ديناميكا	0620212
	0250102	0670203	3	الأحصاء الهندسي	0670203
ج. متطلبات القسم الاختيارية: بخيار الطالب (9) ساعات معتمدة من الجدول أدناه:					
العلامة	المتطلب السابق	المتطلب السابق	ساعات المعتمدة	اسم المادة	رقم المادة
	0670412	0670517	3	خدمة مسبة الاجهال	0670517
	0670444+0212101	0670343	3	خدمة البيئة	0670343
	0670412	0670519	3	خدمة جهور	0670519
	موقلة القسم	0670553	3	مواضع خصبة في الهندسة المدنية	0670553
	0670422	0670522	3	خدمة المطارات والمكث الحديبة	0670522
	0670531	0670532	3	خدمة الامساعات المتقدمة	0670532
	0670443	0670545	3	معالجة المسخافات سائلة وصلبة	0670545

(*) أو مترام،
(**) تدريب ميداني بواقع ٢٨٠ ساعة عملية متصلة لا تتزامن مع الدراسة
بعد اكمال ١١٥ ساعة معتمدة.



العلامة	المتطلب السابق	المتطلب السابق	ساعات المعتمدة	اسم المادة	رقم المادة
	0250101	0250101	3	فناصل وتكامل (١)	0250101
	0250101	0250102	3	فناصل وتكامل (٢)	0250102
	0211101	0211101	3	فيزياء عملة (١)	0211101
	0211102	0211102	3	فيزياء عملة (٢)	0211102
	0212101	0212101	3	كيمياء عملة (١)	0212101
	0660131	0660131	1	الرسم الهندسي اليدوي	0660131
	0660132	0660132	1	الرسم الهندسي بالحاسوب	0660132
	0660132	0620171	1	المسائل الهندسية (١)	0620171
	0630263	0630263	3	لغة برمجة	0630263
	0130102	0640253	3	المهارات الهندسية	0640253
	0640253	0610550	3	الرياضة الهندسية	0610550
ثالثاً: متطلبات القسم التخصصية الإجبارية والمسادة : (١٠٦) ساعة معتمدة					
العلامة	المتطلب السابق	المتطلب السابق	ساعات المعتمدة	اسم المادة	رقم المادة
	0250102	0670231	3	جيولوجيا هندسية	0670231
	0211101 + 0250102	0670211	3	ميكانيكا	0670211
	0620212	0670212	3	مقاومة مواد	0670212
	0670212	0670213	3	مختبر مقاومة مواد	0670213
	0250102	0670214	3	مواد انشائية	0670214
	0670214	0670216	3	مختبر مواد انشائية	0670216
	0670214	0670217	3	انشاء المباني والرسم المدني	0670217
	0670231	0670331	3	ميكانيكا التربة	0670331
	0670331	0670332	1	مختبر ميكانيكا التربة	0670332
	0670212	0670311	3	انشاءات (١)	0670311
	0670311	0670312	3	انشاءات (٢)	0670312
	0670261	0670324	3	التصميم الهندسي للطرق	0670324
	0670324	0670323	3	تصميم وصفات	0670323
	0670323	0670322	1	مختبر الطرق	0670322
	0670311	0670411	3	خرسنة مسلحة ١	0670411
	0670411	0670412	3	خرسنة مسلحة ٢	0670412
	0670312	0670414	2	مشاتل معدنية	0670414
	0670324	0670422	2	خدمة نقل ومرور	0670422
	0250102	0670261	3	مساحة	0670261
	0670261	0670262	1	مختبر مساحة	0670262
	0670412	0670571	3	ادارة مشاريع	0670571
	0670412	0670572	3	مواصفات وعقود وحساب كميات	0670572

العلامة	المتطلب السابق	المتطلب السابق	ساعات المعتمدة	اسم المادة	رقم المادة
	114099	114101	3	مهارات اللغة العربية (١)	114101
	---	111100	3	علم عسكرية	111100
	130099	130101	3	مهارات اللغة الإنجليزية (١)	130101
	130101	130102	3	مهارات اللغة الإنجليزية (٢)	130102
	---	111101	3	التربية الوطنية	111101
	---	111000	0	عمل تطوعي في خدمة المجتمع	111000
ب. متطلبات الجامعة الاختيارية : (12) ساعة معتمدة يدرس الطالب 12 ساعة معتمدة من الجدول أدناه:					
العلامة	المتطلب السابق	المتطلب السابق	ساعات المعتمدة	اسم المادة	رقم المادة
	---	140111	3	مهارات لغوية (١)	140111
	---	140112	3	مهارات لغوية (٢)	140112
	---	111133	3	الفكر والحضارة الانسانية (١)	111133
	---	420143	3	الثقافة القادسية	420143
	---	420140	3	حقوق الاسان	420140
	---	330111	3	مقدمة في ادارة المشاريع	330111
	---	731102	3	مهارات استخدام شبكات التواصل الاجتماعي	731102
	---	910102	3	الثقافة الصحية	910102
	---	780101	3	مهارات الاتصال والتواصل	780101
	---	610230	3	الرياضة والاباح	610230
	---	240152	3	الثقافة البيئية	240152
	---	111112	3	مقدمة في علم النفس	111112

ملاحظة

يُتوجب على جميع الطلبة التقدم لامتحانات المستوى في اللغة العربية واللغة الإنجليزية والحاسوب. وعلى الطالب الذي يخفق في النجاح بهذا الامتحان (أقل من ٥٠%) ان يجتاز نجاح المادة الاستدراكية التي اخفق بها.

دلالة الأرقام المستخدمة في الخطة الدراسية:

- 610 الخدمة الكهربائية
- 620 الهندسة الميكانيكية
- 640 هندسة الميكاترونكس
- 660 هندسة العمارة
- 670 الهندسة المدنية
- 611 هندسة الطاقة المتجددة
- 630 هندسة الحاسوب
- 660 هندسة العمارة

Courses Description

Course No. : 0670202

Course Title : Engineering Statistics

Credit Hrs : 3

Prerequisite Course : 0250102

Presentation and treatment of data; theory of probabilities; random variables; probability distributions (continuous and discrete); sampling theory; statistical estimation; testing hypothesis; correlation and regression analysis.

Course No. : 0670211

Course Title : Statics

Credit Hrs : 3

Prerequisite Course : 0250102

Statics of particles, rigid bodies, equivalent systems of forces, centroids and centers of gravity, analysis of structures, frames, machines and trusses, friction, moments of inertia, principle of virtual work.

Course No. : 0670212

Course Title : Strength of Materials

Credit Hrs : 3

Prerequisite Course : 0670211

Stress-Strain, Torsion, Shear Force and Bending Moment, Stresses in Beams, Deflection of Beams, Analysis of Stress and Strain , Columns.

Course No. : 0670213

Course Title : Strength of Materials Lab.

Credit Hrs : 1

Prerequisite Course : 0670212

Tensile test, compression test, shear test, torsion test, impact test, fatigue test, strain Gauge measurement, creep test, hardness test, application of mechanical load cell, corrosion experiment, examination of material microstructure.

Course No. : 0670214

Course Title : Materials of Construction

Credit Hrs : 3

Prerequisite Course : 0250102

Types, properties and uses of cementations materials and aggregate. Fresh concrete properties, concrete operations, concrete testing, and destructive and non-destructive testing of existing concrete structures. Durability of Concrete. Design of concrete mixes. Production and properties of masonry units including building stones.

Course No. : 0670216

Course Title : Materials of Construction Lab

Credit Hrs : 1

Prerequisite Course : 0670214

Normal Consistency & Setting Time of Cement Past; Fresh and Mechanical Properties of Mortar; Sieve Analysis of Aggregate; Specific Gravity of Aggregate; Unit Weight of Aggregate; Abrasion test of Aggregate; Fresh and Mechanical Properties of Concrete; Mechanical Properties of Steel; Tests on wood; Impact Test on Steel: Hardness Test on Metals.

Course No. : 0670231

Course Title : Engineering Geology

Credit Hrs :

Prerequisite Course :

A study of earth structure, A study of earth materials, formation of rocks, surface feature, agents of weathering, erosion, diastrophism and their effect on engineering construction.

Course No. : 0670261

Course Title : Surveying

Credit Hrs : 3

Prerequisite Course : 0210102

Principles of surveying; distance measurement, chain surveying, electronic distance measurement, angles measurement, coordinates geometry, traverse survey, leveling, profiles and cross-sections, contouring, , areas and volumes, design and setting out horizontal and vertical curves.

Course No. : 0670262

Course Title : Surveying Lab

Credit Hrs : 1

Prerequisite Course : 0670261

Pacing and taping, chain surveying mapping, layout of buildings using chain surveying and theodolites, angles measurement and coordinates geometry using theodolites, traverse survey using total stations, running a leveling network using levels, setting out curves by different methods.

Course No. : 0670311

Course Title : Structural Analysis I

Credit Hrs : 3

Prerequisite Course : 0670212

Structural forms, types of supports, degree of determinacy, reactions, determinate structures, plane trusses, space trusses, shear and moment diagrams for beams and frames, three hinged arches, influence lines for beams and trusses, deflections.

Course No. : 0670312

Course Title : Structural Analysis II

Credit Hrs : 3

Prerequisite Course : 0670311

Analysis of statically indeterminate structures: method of consistent displacements; three moment equation, evaluation of fixed end moments; slope deflection method; moment distribution method; column analogy. Approximate methods. Computer applications.

Course No. : 0670315

Course Title : Structures Mechanics and Structure Analysis

Credit Hrs :

Prerequisite Course :

Forces systems, the equilibrium, constructions (trusses and structures), distributed forces (the center of gravity and center of space), David (shear strength and bending torque), the torque of inertia, stress and strain, the stresses in the composite objects, thermal stresses, stress and emotion, stress and emotion bending shear, marbleizing, vertically mounted elements, Ely). As well as the introduction of construction in architecture, structural, structural elements and materials, steel structure and methods of analysis, David and determination of bending and shearing, planned static structures analysis, construction is planned, and a determined, marbling and calculated an approximate solution methods, non-prescribed use of tables and data to approximate analysis methods.

Course No. : 0670323

Course Title : Pavement Design

Credit Hrs : 3

Prerequisite Course : 0670324

Types of pavement, sand materials used in pavement, materials used in asphalt pavement, reclamation and cumulative properties of layered construction of roads, axle loads, the design of hot asphalt mixtures using the Marshall test, pavement maintenance.

Course No. : 0670322

Course Title : Highway Engineering Lab

Credit Hrs : 1

Prerequisite Course : 0670323

Tests on penetration, softening and flash points, ductility, viscosity, CBR, specific gravity, blending of aggregate, Marshall mix design, extraction, aggregate properties, skid resistance.

Course No. : 0670324

Course Title : Geometric Design of Highway

Credit Hrs : 3

Prerequisite Course : 0670261

Highway geometric design, roadside design, intersections, interchanges, highway drainage and drainage facilities, laying-out highways, mass diagram, pavement materials, flexible pavement mix design and construction.

Course No. : 0670331

Course Title : Soil Mechanics

Credit Hrs : 3

Prerequisite Course : 0670231

Composition and structure of soils, Phase relations and index properties, soil classification, soil compaction, principle of effective stress, stresses due to self-weight, stresses due to applied loads, soil permeability, seepage: one and two dimensional, flow net, consolidation theory and consolidation settlement analysis.

Course No. : 0670332

Course Title : Soil Mechanics Lab

Credit Hrs : 1

Prerequisite Course : 0670331

Water content (Oven drying & Speedy Moisture tester), specific gravity of soil particles, liquid limit and plastic test, Shrinkage limit test (linear & volumetric), consolidation test, dry density & water Relation (Proctor Compacting), dry density in field by sand cone & rubber balloon, California bearing ratio test, permeability of soil (Constant head & falling head), bearing capacity of soil-unconfined test, bearing capacity of soil-tri-Axial test, direct shear test (for sandy soil)

Course No. : 0670343

Course Title : Environmental Engineering

Credit Hrs : 3

Prerequisite Course : 0212101

Quantities and units; environmental systems and transformation processes; material balance relationships and reactor concepts; energy fundamentals; thermodynamics and equilibrium constants; environmental chemistry: stoichiometry, chemical equilibria, and organic chemistry; transport processes; interphase mass transfer; interphase partition phenomena: fugacity and mass transfer; water pollution; air pollution; basic environmental microbiology; mathematics of growth.

Course No. : 0670381

Course Title : Fluid Mechanics

Credit Hrs : 3

Prerequisite Course : 0670211

Fluid properties, basic units. Fluid statics, pressure and its measurements, force on plane and curved submerged surface, floatation. Fluid in motion, flow kinematics and visualization, Control volume approach, differential and integral continuity equation, pressure variation in flowing fluids, Euler's and Bernoulli's equations, Application of Bernoulli equation, Momentum principle and its applications. Flow in conduits, laminar and turbulent flows.

Course No. : 0670382

Course Title : Fluid Mechanics Lab

Credit Hrs : 1

Prerequisite Course : 0670381

Introduction (density, surface tension and viscosity), flow measurements, impact of jet, open channel flow (sluice gate, weirs, hydraulic jump and manning formula), losses in pipes, pressure distribution about a circular cylinder, drag force determination, analysis of an airfoil, turbine and pump unit.

Course No. : 0670411

Course Title : Reinforced Concrete (1)

Credit Hrs : 3

Prerequisite Course : 0670312

Properties of concrete and steel, allowable stress design, cracked and uncracked sections, strength design, stress block, singly and doubly reinforced sections, rectangular sections, T-sections and other shapes, design for bending, shear design, bond requirements, development length, one-way and ribbed slabs, approximate methods for two-way slabs, short columns.

Course No. : 0670412

Course Title : Reinforced Concrete (2)

Credit Hrs : 3

Prerequisite Course : 0670411

Ultimate strength versus unified design approaches, tension- and compression-controlled members, strain limits. Serviceability analysis, deflection and cracking control. Analysis and design for torsion. Slender columns. Analysis of building frames, simplifications, idealization. Two-way slabs, direct design method, equivalent frame method. Design of stairs.

Course No. : 0670413

Course Title : Metallic Structures

Credit Hrs : 3

Prerequisite Course : 0670312

Structural Steel Design, Design of structural steel elements in bridges and building structures, plate girders, and other built-up members, beams and slender columns, and connections.; detailing of steel structures; computer applications.

Course No. : 0670416

Course Title : Steel and Concrete Structures

Credit Hrs : 3

Prerequisite Course : 0670415

Basic concepts of ultimate strength design method, behavior of ductile and brittle modes of failure of reinforced concrete sections under bending, analysis of reinforced concrete sections under bending, design of reinforced concrete sections under bending ,reinforcement layout and detailing, introduction shear behavior of reinforced concrete sections, design for shear reinforcement, analysis and design of reinforced concrete solid slab and ribbed slab, analysis and design of short columns under axial and bending, understand steel and its structural properties, design of tension members, design of compression members.

Course No. : 0670421

Course Title : Transportation Engineering

Credit Hrs : 3

Prerequisite Course : 0670324

Highway transportation system, operation and control of transportation vehicles, transportation studies, traffic impact analysis, design of land transportation terminals, the transportation planning process, basic elements of transportation planning, traffic operations, highway capacity and level of service, transportation economics.

Course No. : 0670441

Course Title : Hydraulics

Credit Hrs : 3

Prerequisite Course : 0670381

Hydraulics of pipe networks, groundwater flow, and design criteria. Open channel flow. Flow measurements. Hydraulic structures. Pumps and turbines. Seepage. Hydraulic modeling. Hydrology of surface and ground water.

Course No. : 0670442

Course Title : Hydraulics Lab

Credit Hrs : 1

Prerequisite Course : 0670441

Density, specific gravity, viscosity; fluid characteristics; continuity, conservation of energy; fluid behavior: center of pressure, pipe flow, open channel flow; and pump performance.

Course No. : 0670443

Course Title : Sanitary Engineering

Credit Hrs : 3

Prerequisite Course : 0670343

Physical, biological and chemical water quality and water quality parameterization. Water and environmental regulations. Standards and criteria. Unit operations and processes. Chemical and biological kinetics. Basics in water and wastewater engineering design. Wastewater generation and collection. Biological wastewater treatment and reuse. Population estimation. Water treatment design. Impact of source quality on treatment units' selection. Sedimentation, filtration, coagulation-flocculation and disinfection.

Course No. : 0670444

Course Title : Sanitary Engineering Lab

Credit Hrs : 1

Prerequisite Course : 0670443

Volumetric and spectrophotometric analytical methods are used to determine quality parameters of raw water, finished water and wastewater. Parameters tested include alkalinity, hardness, salinity and solids, BOD and COD among others.

Course No. : 0670472

Course Title : Engineering Economics

Credit Hrs : 2

Prerequisite Course : 0210106

Concepts of time value of money. Simple and compound interest. Decision making among alternatives and evaluation of public projects. Inflation, depletion and depreciation calculations. Cost of owning and operating equipment. Breakeven, Minimum Cost life, and replacement analysis. Taxes.

Course No. : 0670517

Course Title : Pre-stressed Concrete

Credit Hrs : 3

Prerequisite Course : 0670412

The behavior of concrete and steel under sustained load . Analysis and design of pre-tensioned and post-tensioned reinforced concrete members , and designing these members into the integral structure . The aim of this course is Calculating stresses in a composite system with a precast prestressed concrete beam and a cast in place concrete slab at various stages of construction and service . Also Computing camber , deflections , and cracking of prestressed concrete beams .

Course No. : 0670519

Course Title : Bridge Engineering

Credit Hrs : 3

Prerequisite Course : 0670412

Materials of bridge construction; bridge loads and design philosophy; design of reinforced concrete bridges; design of prestressed concrete bridges; design of steel bridges; design of plate-girder and continuous steel beam bridges; inspection, rehabilitation and maintenance of bridges;

bridge-type selection criteria.

Course No. : 0670522

Course Title : Airports and Railways Engineering

Credit Hrs : 3

Prerequisite Course : 0670421

This course is designed for civil engineering students in their fifth year. The course intends to introduce the nature of civil aviation and Airports, Aircraft characteristics related to airport design, utility of airports, Runways characteristics and configuration, Taxiways and Taxi lanes and Aprons, Necessity of Railways, and Classification of railways and system of Railways.

Course No. : 0670531

Course Title : Foundation Engineering

Credit Hrs : 3

Prerequisite Course : 0670331

Types of shallow foundations, bearing capacity of foundations: equations and correlations, settlement, design of isolated footings, special types of footings, rectangular combined and strap footings, lateral earth pressure and retaining walls.

Course No. : 0670541

Course Title : Hydrology

Credit Hrs : 3

Prerequisite Course : 0670441

Hydrologic cycle evaporation; transpiration; precipitation; runoff; hydrographs, aquifers; Darcy's law; well hydraulics, watershed characteristics, channel routing, frequency analysis.

Course No. : 0670459

Course Title : Practical Training

Credit Hrs : 0

Prerequisite Course : 90 hrs.

Practical (8 weeks) training in a Civil Engineering Project or any other place approved by the department, and according to the regulations drafted by the college of Engineering Training Committee.

Course No. : 0670545

Course Title : Water and Wastewater treatment Systems Design

Credit Hrs : 3

Prerequisite Course : 0670443

Design of municipal water and wastewater treatment plants. Emphasis on: characterization of water and wastewater, physical, chemical and biological treatment methods; sewer design; processing of sludge; water reuse; and advanced treatment methods are considered.

Course No. : 0670551

Course Title : Graduation Project (1)

Credit Hrs : 1

Prerequisite Course : 120 hrs.

Preparation and starting of a engineering project in one of the civil engineering fields (structures, water and environmental engineering, highway engineering).

Course No. : 0670552

Course Title : Graduation Project (2)

Credit Hrs : 2

Prerequisite Course : 0670551

Continuation of project (1) (writing a technical report and the project drawings and details).

Course No. : 0670553

Course Title : Special Topics in Civil Engineering

Credit Hrs : 3

Prerequisite Course : 120 hrs.

Three Credit Hours given in any topic chosen in civil engineering

Topic A : Construction Methods and Equipment

Construction project phases and elements, Construction project layout, Concrete and concrete works: Batching, mixing, handling, casting, curing, ,...etc., Formworks for concrete structures: materials & design, Construction equipment : Excavating equipment, power shovels, draglines,...etc., Hauling equipment : trucks & scrapers. Soil compaction: methods & different types of rollers, Safety and accidents in construction projects: investigation, control & prevention

Topic B : Geographic Information Systems (GIS)

The concept of geographic information and geographic information systems, geography, the relationship between geographic information science and space, the relationship between geographic information and mapping and charts . GIS applications in civil engineering , project quarterly.

Course No. : 0670571

Course Title : Project management

Credit Hrs : 3

Prerequisite Course : 0670412

The nature of engineering projects, Project life cycles, Planning, project management concepts, network analysis using arrow techniques network analysis. Overlapping networks, project monitoring, project control, time- cost trade off.

Course No. : 0670572

Course Title : Specifications, Contracts, and Quantities.

Credit Hrs : 3

Prerequisite Course : 0670412

Contractual procedures, types of contracts, contract documents, bills of quantities, quantity measurement. Technical and standard specifications . Methods of writing specifications .

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 Civil 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 Civil Engineering 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 Civil Engineering Department mission section*).

Honors and Awards

Philadelphia University and the Civil Engineering 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.