Philadelphia University

Faculty of Engineering
Civil Engineering Department
Second Semester
2016 – 2017

Courses Description

Course No. : 0670202
Course Title : Engineering Statistics
Credit Hrs : 3
Prerequisite Course : 0250102

Introduction to engineering statistics , 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

The structure of material, powerful atomic and energy relationship, structure and properties of the nucleus ,Electron shells, and Radioactivity, General classification and structure of materials, atomic of bonds, solid state structure, metallic crystals and defects, polymers structure ,Elastic and plastic deformation, crack , creep, fatigue. Bonding materials, cement and aggregate, quality water, admixtures, fresh concrete properties, concrete operation mixing, handing, placing, compacting concrete ,curing concrete ,design of concrete mixes,testing of concrete and bricks working.

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 materials, Formation of rock, Surface feature, Analysis of 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, Angle measurement, Coordinates geometry, Traverse surveying, Leveling, Profile 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 force method; slope deflection method; moment distribution method; matrix method of structural analysis , plastic method.

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, Asphaltic pavement materials, Reclamation and cumulative properties of layered construction of roads, Axle Loads, Design of hot asphalt mixture 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

Design control and criteria; Characteristics of driver, pedestrian, vehicle and the road; sight distance; horizontal and vertical alignment; cross-section elements; super elevation attainment; earthwork computations; mass haul diagram; highway classification; intersections and interchanges ; drainage design.

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 shear strength, Soil permeability, One and two dimensional seepage, Flow net, Consolidation theory

Course No. : 0670332
Course Title : Soil Mechanics Lab
Credit Hrs : 1
Prerequisite Course : 0670331

Water content, Specific gravity, of soil particles, Liquid limit, Plastic Limit, Shrinkage Limit (Linear and Volumetric), Consolidation test, Compaction test, California Bearing Ratio, Density in field by sand cone and rubber balloon, Permeability test (constant and variable head), Unconfined test, Try axial test, Direct shear test,

Course No. : 0670343
Course Title : Environmental Engineering
Credit Hrs : 3
Prerequisite Course : 0212101

Environmental system overview, Conservation theory, Material balance, State of Mixing, Reactor types, Water quality and Wastewater characteristics, Water quality standards, Water pollution, Water and wastewater treatment systems; objectives of primary, secondary and tertiary treatment; Air pollution, Acid rain, Ozone depletion and global warming; Air pollution control devices.

Course No. : 0670381
Course Title : Fluid Mechanics
Credit Hrs : 3
Prerequisite Course : 0670211

Fundamental Fluid prosperities, Basic units. Pressure and its Measurement, Fluid Statics, Force on plane& Inclined and Curved Submerged Surface, Floatation. Fluid Kinematics , Control Volume Approach, Differential and Integral Continuity Equation, Energy Equations, Application of Bernoulli equation, Momentum Principle and its Applications.

Course No. : 0670382
Course Title : Fluid Mechanics Lab
Credit Hrs : 1
Prerequisite Course : 0670381

Fundamental Fluid prosperities, Basic units., Pressure and its Measurement, Fluid Statics, Force on plane& Inclined and Curved Submerged Surface, Floatation. Fluid Kinematics , Control Volume Approach, Differential and Integral Continuity Equation, Energy Equations, Application of Bernoulli equation, Momentum Principle and its Applications.

Course No. : 0670411
Course Title : Reinforced Concrete (1)
Credit Hrs : 3
Prerequisite Course : 0670312

Properties of concrete and steel, allowable stress design, cracked and untracked 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

Transportation systems; transportation system and elements; traffic flow theory; transport demand forecasting; environment impact, traffic studies; traffic safety ; capacity and level of service concept capacity analysis of multilane, two lane and freeway ; capacity analysis of signalized and unsgnalized intersections; traffic signal coordination ; computer applications in traffic.

Course No. : 0670441
Course Title : Hydraulics
Credit Hrs : 3
Prerequisite Course : 0670381

Flow in pipes, Pipes Networks Analysis, Open Channel Fundamentals, Open Channel Flow Analysis, Classification of Flow,(Uniform Flow), Critical Flow (Supercritical, Subcritical), Gradually Varied Flow, Water Surface Profile Analysis, Rapid Varied Flow (Hydraulic Jump), Dimensional Analysis, Similitude in Engineering, Pumps, Turbines.

Course No. : 0670442
Course Title : Hydraulics Lab
Credit Hrs : 1
Prerequisite Course : 0670441

Conducting the following Experiments: Osborne Reynolds Demonstration, Impact of Jets, Orifice and free jet flow, Dead Weight Pressure, Metacentric Height, Ground Water Flow and Well abstraction unit, Energy Loss in Hydraulic Jump, Flow Over Weirs, Rainfall Hydrograph, Water Hammer.

Course No. : 0670443
Course Title : Sanitary Engineering
Credit Hrs : 3
Prerequisite Course : 0670343

Water use trends and forecasting, capacity requirements, water demands, population projection; Water treatment engineering design parameters, treatment processes, mechanisms, principles, types, and design. Wastewater treatment engineering design parameters, preliminary treatments, sedimentation, clarification, biological treatment and disinfection

Course No. : 0670444
Course Title : Sanitary Engineering Lab
Credit Hrs : 1
Prerequisite Course : 0670443

Preparation of solutions, acids-bases titration , water analysis including: solid, alkalinity, turbidity, hardness ,conductivity, biochemical and chemical oxygen demand determination, and JAR test for coagulations and flocculation process.

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
Course No. : 0670519

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

The course intends to introduce the nature of civil aviation and Airports, Aircraft characteristics related to airport design, components of airport and the characteristics for each component, design the pavement of airport , introduction of Railways.

Course No. : 0670531
Course Title : Foundation Engineering
Credit Hrs : 3
Prerequisite Course : 0670331

Soil site Exploration, Soil Improvement, Earth pressures, Foundation Settlement, Bearing Capacity, Stability of Slopes, Factors to consider in foundation design, Design of Shallow foundations, Design of Retaining Walls.

Course No. : 0670541
Course Title : Hydrology
Credit Hrs : 3
Prerequisite Course : 0670441

Introduction to Hydrology, Hydrological Cycle, Precipitation, Evaporation, Types of Rainfall, Rainfall Measurements, Hydrograph Analysis, Unit Hydrograph, Frequency and Peak Flow Analysis, Flood Routing, Reservoir Sizing, Introduction to Ground Water, Ground Water Flow Equations and Types of Aquifers.

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

Waste definition, classification in the context of EU legislation; waste types; Integrated waste management, Waste treatment technology: incineration and other treatment; Examples for waste management practices in developing countries and developed countries; Waste generation in Jordan.

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.

Course No. : 0670571
Course Title : Project management
Credit Hrs : 3
Prerequisite Course : 0670412

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