Philadelphia University

Faculty of Engineering and Technology
Civil Engineering Department
2020-Plan

Courses Description

Course No.: 0670203
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+0211101

Force vectors, Statics of particles, rigid bodies, equivalent systems of forces, centroids and centers of gravity, analysis of structures, frames, machines and trusses, Internal force (shear and moment diagram), friction, moments of inertia.

Course No.: 0670212
Course Title: Strength of Materials
Credit Hrs: 3
Prerequisite Course: 0670211

Stress, Strain, Stress-Strain relationship, Axial load, Torsion, Bending, Transverse Shear, stress and strain transformation, deflection of beams, buckling of columns.

Course No.: 0670213
Course Title: Strength of Materials Lab.
Credit Hrs: 1
Prerequisite Course: 0670212

Tensile test, Shear force and bending moment test, Impact test, Fatigue test, Creep test, Hardness test, Deflection of beams, Buckling.

Course No.: 0670214
Course Title: Construction Materials
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 testing and aggregate testing, water quality, admixtures, fresh concrete properties, concrete operation mixing, handing, placing, compacting concrete, curing concrete, design of concrete mixes, testing of concrete and bricks.

Course No.: 0670216
Course Title: Construction Materials Lab
Credit Hrs: 1
Prerequisite Course: 0670214

Tests of Cement at Construction site, Fineness of Cement, Normal Consistency, Initial and final Setting time, Density and Specific Gravity of cement, Slump Test, Flow Table test, Compressive Strength, Tensile Test, Sieve Analysis, Specific gravity and Absorption for Coarse aggregate, Specific Gravity and Absorption For fine aggregate.

Course No.: 0670217
Course Title: Building Construction and Civil Drawing
Credit Hrs: 3
Prerequisite Course : 0670214

Structural elements, Type of buildings, Type of loadings, type of slabs, calculation of Dead load and live load on solid and ribbed slab, one way and two way slab, distributed load from slab to beams, determination load on column that coming from slab, determination of maximum moment on beams, determine whether the column is short or slender, calculation of cross section of short column, site preparation, soil testing, excavation works, and types of foundation: raft, piles, footings, etc. determination of area and thickness of footing, Openings such as windows, doors, skylights and ventilation shafts, stairs, drawing sketches of cross section in beam, column, slab, ..etc..

Course No.: 0670231
Course Title: Engineering Geology
Credit Hrs: 3
Prerequisite Course: 0250102

A study of earth materials, Formation of rock, Surface feature, Analysis of agents of weathering, Erosion, soil investigation, Diastrophism and their effect on engineering construction.

Course No.: 0670261
Course Title: Surveying
Credit Hrs: 3
Prerequisite Course: 0250102

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, earth works, Design and setting out horizontal and vertical curves.

Course No.: 0670262
Course Title: Surveying Lab
Credit Hrs: 1
Prerequisite Course: 0670261

Pacing and taping, Layout of buildings using theodolites, Angles measurement and coordinates geometry using theodolites, Traverse survey using total stations, Running a leveling network using levels, Determination of irregular areas using Planimeter device, Loop and link traverse, Measurement of horizontal distances of building using theodolite, Measurement of vertical distances using theodolite .

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; stiffness method of structural analysis, plastic method.

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 asphalt : Penetration, Softening point , Flash and fire points, Ductility and Viscosity, Aggregate properties by blending of aggregate using L.A.A.V and CBR Test, Marshall mix design for asphalt mixture, Specific gravity for asphalt mixture , Skid resistance for surface layer.

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 dimensional seepage, 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, Consolidation test, Compaction test, Density in field by sand cone, Permeability test (constant and variable head), Unconfined test, Direct shear test,

Course No.: 0670343
Course Title: Environmental Engineering
Credit Hrs: 3
Prerequisite Course: 0212101+0670444

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.: 0670411
Course Title: Reinforced Concrete (1)
Credit Hrs: 3
Prerequisite Course: 0670312

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

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.: 0670414
Course Title: Steel Structures
Credit Hrs: 2
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.: 0670422
Course Title: Transportation Engineering
Credit Hrs: 2
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 unsignalized 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: 0670381

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.

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.: 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.: 0670522
Course Title: Airports and Railways Engineering
Credit Hrs: 3
Prerequisite Course: 0670422

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

Introduction to foundation types, review of main chapters of soil mechanics (stresses, consolidation, shear strength. Soil site Exploration, Bearing Capacity, Factors to consider in foundation design, 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.: 0670499
Course Title: Practical Training
Credit Hrs: 3
Prerequisite Course: 115 hrs.

Field training which the civil engineering students should undergo in reputable factories or companies in the private or public sectors. The training is for a period of eight consecutive weeks (280 hr).

Course Title: Graduation Project (1)
Credit Hrs: 1
Prerequisite Course: 100 hrs.

The course is a requirement for level 5 of civil engineering students. It introduces the basic principles and analysis of scientific research and technical report writing.

Course No.: 0670552
Course Title: Graduation Project (2)
Credit Hrs: 2
Prerequisite Course: 0670551+0670499

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: Department Approval

Three Credit Hours given in any topic chosen in civil engineering.

Course No.: 0670554
Course Title: Computer Applications in Civil Engineering
Credit Hrs: 3
Prerequisite Course: 120 credit hours

Basic AUTO CAD Commands, Introduction to Prokon software. Analysis and Design of R.C. Building Frames by using ETABS, Analysis and Design of slab and mat footing by using SAFE. Preparation of Contour Maps and Alignment fixing of Roads by using AUTO CIVIL. Quantity estimation of Civil Engineering Structures and Construction Management.

Course No.: 0670555
Course Title: Fundamentals of Finite Element Analysis
Credit Hrs: 3
Prerequisite Course: 120 credit hours

This course covers the theory and application of matrix structural analysis for trusses, beams, 2D frames, and 3D space frames, as either determinate or indeterminate systems. Methods used will include the direct stiffness method, and flexibility and stiffness method with introduction to computer-based techniques to analyze structures. This course is an introduction to the finite-element method.

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

Define project management and the role of management, project management concept, and determine project parties and responsibilities of each part. Project planning and plan the work: perform WBS, estimate activity duration, and establish relationships among the project activities. Perform network analysis and scheduling calculations, and determine critical path of the project. Tracking progress and evaluate the project status. Perform earned value analysis to control schedule and cost variances.

Course No.: 0670572
Course Title: Specifications, Contracts, and Quantities Surveying.
Credit Hrs: 3
Prerequisite Course: 0670412

Understand construction contracts' characteristics and features, contractual procedures, project delivery methods, type of contracts, contract's documents, and bill of quantities (BOQ). Be familiars with Jordanian construction contracts for construction projects. Understand specifications in construction projects and Jordanian specifications. Quantify several quantities in construction projects and able to prepare BOQ.