ÇUKUROVA UNIVERSITY
CIVIL ENGINEERING DEPARTMENT
UNDERGRADUATE CURRICULUM

1. SEMESTER

COURSES	T+A	ECTS
INS-111 Calculus for Engineers I	5+0	**6**
INS-113 Physics for Engineers	4+0	**6**
INS-105 Introduction to Civil Engineering	3+0	**3**
INS-109 Technical Drawing	3+0	**5**
ENF-121 Fundamentals of Inf. Tech.	2+2	**4**
IN-115 English I	3+0	**2**
AI-101 Atatürk's Principles and Reforms I	2+0	**2**
TD-111 Turkish Language I	2+0	**2**
	26	**30**

2. SEMESTER

COURSES	T+A	ECTS
INS-110 Calculus for Engineers II	5+0	**6**
INS-114 Linear Algebra	4+0	**5**
INS-106 Statics	4+0	**6**
INS-108 Computer Aided Drawing	3+0	**4**
INS-104 Geology for Civil Engineers	3+0	**3**
IN-116 English II	3+0	**2**
AI-102 Atatürk's Principles and Reforms II	2+0	**2**
TD-112 Turkish Language II	2+0	**2**
	26	**30**

3. SEMESTER

COURSES	T+A	ECTS
INS-225 Differential Equations	3+0	**5**
INS-215 Statistical Methods in Engineering	4+0	**5**
INS-233 Dynamics	4+0	**6**
INS-235 Strength of Materials I	4+0	**6**
INS-237 Structural Elements I	3+0	**5**
ENF-201 Computer Programming	2+2	**3**
	22	**30**

4. SEMESTER

COURSES	T+A	ECTS
INS-214 Numerical Methods in Eng.	4+0	**5**
INS-212 Materials of Construction	4+0	**6**
INS-232 Surveying	4+0	**5**
INS-236 Strength of Materials II	4+0	**6**
INS-238 Structural Elements II	3+0	**5**
INS-234 Architectural Design	3+0	**3**
	22	**30**

5. SEMESTER

COURSES	T+A	ECTS
INS-315 Structural Analysis I	4+0	**5**
INS-307 Reinforced Concrete I	4+0	**5**
INS-311 Fluid Mechanics I	4+0	**5**
INS-317 Soil Mechanics I	3+0	**4**
INS-331 Transportation Engineering I	3+0	**4**
INS-333 Engineering Economy	4+0	**4**
INS-351 Internship 1	0+2	**3**
	24	**30**

6. SEMESTER

COURSES	T+A	ECTS
INS-306 Structural Analysis II	4+0	**5**
INS-320 Reinforced Concrete II	4+0	**5**
INS-312 Fluid Mechanics II	4+0	**5**
INS-318 Soil Mechanics II	3+0	**4**
INS-332 Transportation Engineering II	3+0	**4**
INS-316 Hydrology	4+0	**4**
INS-352 Internship 2	0+2	**3**
	24	**30**

7. SEMESTER

COURSES	T+A	ECTS
INS-427 Cons. Project Management I	3+0	**4**
INS-417 Steel Structures	4+0	**5**
INS-403 Hydraulic Structures I	4+0	**5**
INS-413 Water Supply and Sewerage	4+0	**4**
INS-429 Reinforced Concrete Project	2+2	**5**
Elective Course	3+0	**4**
INS-451 Internship 3	0+2	**3**
	24	**30**
Elective Courses		
INS-431 Soil Mechanics III	3+0	**4**
INS-433 Introduction to Earthquake Eng.	3+0	**4**
INS-435 Project Planning and Control	3+0	**4**

8. SEMESTER

COURSES	T+A	ECTS
INS-428 Cons. Project Management II	3+0	**4**
INS-416 Foundation Engineering	4+0	**5**
INS-424 Hydraulic Structures II	4+0	**5**
INS-418 Civil Engineering Laboratory	1+2	**4**
INS-400 Graduation Project	0+5	**5**
Elective Course	3+0	**4**
INS-452 Internship 4	0+2	**3**
	24	**30**
Elective Courses		
INS-410 Irrigation and Drainage	3+0	**4**
INS-430 Steel Structure Design	3+0	**4**
INS-432 Construction Law	3+0	**4**
INS-434 Occupational Health and Safety	3+0	**4**

CIVIL ENGINEERING DEPARTMENT 1. SEMESTER COURSES

INS-105 INTRODUCTION TO CIVIL ENGINEERING (3+0)

Introduction to Civil Engineering. Definition of civil engineering profession. Phases of civil engineering works, drawings and specifications. Uses and behaviour of construction materials. Railways, roads and traffic engineering. Hydraulic structures.

INS-109 TECHNICAL DRAWING (3+0)

Introduction to drawing instruments and their use. Applications of norm lettering and figures. Introduction to sketching and sectioning. Point, linear and planar projections of geometrical shapes. Concepts of perspectives and sections.

INS-111 CALCULUS FOR ENGINEERS I (5+0)

Numbers. Functions. Limit, continuity, derivative. Minimum and maximum. Reverse functions. Trigonometric functions. Logarithmic and exponential functions. Hyperbolic functions. Polar and parametric functions. Characteristics of curves. MacLaurin and Taylor series. Definite and indefinite integrals.

INS-113 PHYSICS FOR ENGINEERS (4+0)

Vectors. Particle kinematics and dynamics. Conservation of energy and linear momentum. Rotational kinematics. Dynamics of rigid bodies. Conservation of angular momentum. Gyroscopes. Oscillations. Elementary kinetic theory.

ENF-121 (ENF-101) FUNDAMENTALS OF INFORMATION TECHNOLOGIES (2+2)

Introduction of information systems, hardware units of a personal computer, operating systems, word processors, worksheets, presentation programs, data base programs, computer networks, electronic mail, internet and World-Wide-Web, introduction to Web page design.

CIVIL ENGINEERING DEPARTMENT 2. SEMESTER COURSES

INS-104 GEOLOGY FOR CIVIL ENGINEERS (3+0)

Engineering geology and civil engineering. Physical properties of earth materials. Properties of common rock forming minerals. Classification of rocks. Ignous rocks. Sedimentary rocks. Metamorphic rocks. Soil materials. Geologic processes and time. Erosion processes. Tectonic processes. Earthquakes. Geologic maps and sections.

INS-106 STATICS (4+0)

Fundamentals of mechanics. Review of vector algebra. Important vectorial quantities. Equivalent force systems. Equilibrium and equilibrium equations. Introduction to mechanics of beams, trusses, frames, and machines. Frictional forces. Normal force, shear force and bending moment diagrams. Properties of surfaces. Method of virtual work.

INS-108 COMPUTER AIDED DRAWING (3+0)

Beginning arrangements and running AUTOCAD. AUTOCAD file processing units. Preliminary and auxiliary commands. Basic drawing commands and their applications. Text writing commands and their applications. Modify and arrangement commands and their applications. Display control commands. Layers and objects properties commands and their applications. Dimension commands and their applications. Block definitions and specifies of a block to insert. An example of drawing a housing plan for application all commands.

INS-110 CALCULUS FOR ENGINEERS II (5+0)

Indefinite integral. Definite integral. Length. Area. Volume. Center of gravity. Multivariate functions. Continuity. Partial derivates. Extremes. Total differential. Double and triple integrals.

INS-114 LINEAR ALGEBRA (4+0)

Fundamentals of matrix algebra. Determinants. Inverse matrix. Solution of systems of linear equations. Eigenvalues and eigenvectors. Vector, plane and line. Coordinate Transformations. Circle and sphere. Classification of second order curves.

CIVIL ENGINEERING DEPARTMENT 3. SEMESTER COURSES

INS-215 STATISTICAL METHODS IN ENGINEERING (4+0)

Introduction to basic concepts. Methods and applications of statistics. Descriptive statistics. Histograms. Measures of central tendency and dispersion. Theory of sets and probability. Random variables and probability functions, binomial Poisson negative exponential, and normal distributions. Sampling theory. Statistical prediction. Decision making. Applications in engineering, regressions, correlations and hypothesis tests.

INS-225 DIFFERENTIAL EQUATIONS (3+0)

Development of differential equations. Ordinary and partial differential equations. First degree linear differential equations and some methods for their solutions. Homogeneous equations with constant coefficients. Nonhomogeneous equations. Second order differential equations with variable coefficients. Systems of differential equations.

INS-233 DYNAMICS (4+0)

Kinematics of particles. Dynamics of particles. Work and energy. Impulse and momentum. Kinematics of rigid bodies. Dynamics of rigid bodies. Planar motion of rigid bodies. Work, energy, impulse and momentum for rigid bodies. Mechanical vibrations.

INS-235 STRENGTH OF MATERIALS I (4+0)

Internal forces and moments in members. Axial loading. Tension ratio. Deformations and stresses in members under axial loading. Thermal effects. State of stress and strain at a point. Transformation rules for stresses and strains. Mohr circle. Principal stresses and strains. Generalized Hooke's law for elastic materials. Various yield. Criteria for ductile and brittle materials. Torsion of bars with circular, rectangular, open and closed thin walled cross sections.

INS-237 STRUCTURAL ELEMENTS I (3+0)

Definition and classification of structures. Design on to soil base. Excavation and retaining works. Foundations. Masonry walls. Brick walls. Mass concrete. Reinforced concrete. Wooden slabs. Lintels. Beams in walls. Arches. Domes. Stairways.

ENF-201 COMPUTER PROGRAMMING (2+2)

Definition and historical development of computers. Units and operation principles of a computer system. Representation of numeric and alphabetic data in computer's memory. Precision in computations. Programming principles. Introductory FORTRAN. Various applications.

CIVIL ENGINEERING DEPARTMENT 4. SEMESTER COURSES

INS-212 MATERIALS OF CONSTRUCTION (4+0)

Cementitious materials. Portland cements. Pozzolan-added cements. Aggregates. Standard laboratory test on aggregates. Properties of normal, heavy-weight, light-weight, and special concretes. Concrete mix design computations. Laboratory tests on fresh and hardened concrete.

INS-214 NUMERICAL METHODS IN ENGINEERING (4+0)

Definition and significance of numerical methods. Iteration. Convergence. Relative error. Roots of algebraic and transcendental equations. Direct and iterative solutions for sets of linear equations. Iterative solutions for sets of nonlinear equations. Eigenvalue problems. Interpolation. Numerical differentiation. Numerical integration. Numerical methods for approximate solutions of differential equations.

INS-232 SURVEYING (4+0)

Definitions. Horizontal measurements by simple devices. Leveling. Measurement of angles. Horizontal and vertical measurements in field and evaluations. Stadia methods. Planimeter applications on map. Surveying methods. Triangulation. Polygonization computations and drawings. Traverses. Route surveys. Various field application.

INS-234 ARCHITECTURAL DESIGN (3+0)

Definitions. Stages of an architectural project. Programming. Drafting. Preliminary and final project concepts. Applications project. Details. Walls. Slabs. Stairways. Roofs. Roof-coverings.

INS-236 STRENGTH OF MATERIALS II (4+0)

Static and inertia moments. Transformation rules and Mohr circle for inertia moments. Pure bending. Unsymmetric bending. Flexural analysis of beams under transverse loading. Shear center. Combined loadings: Bending and axial load, bending and axial torsion. Deflection of beams by integration method. Statically indeterminate beams. Method of superposition. Deflection analysis of beams by moment-area method. Energy methods. Energy methods. Strain energy. Castigliano’s theorems. Virtual work principle. The method of unit loading for the analysis of indeterminate systems. Buckling of columns. Euler’s formula. Design of columns under axial loading.

INS-238 STRUCTURAL ELEMENTS II (3+0)

Forms and scaffolding for reinforced concrete. Dilatation. Insulation and isolation. Wood work. Plasters. Paints. Wall. Slab, and ornamental roof coverings. Prefabricated construction.

CIVIL ENGINEERING DEPARTMENT 5. SEMESTER COURSES

INS-307 REINFORCED CONCRETE I (4+0)

Fundamental principles of reinforced concrete design. Ultimate strength analysis of axially loaded columns. Ultimate strength analysis of beams under simple bending. Ultimate strength analysis of eccentrically loaded columns. Structural safety. Ultimate strength design of beams. Ultimate strength design of eccentrically loaded columns. Diagonal tension and torsion.

INS-311 FLUID MECHANICS I (4+0)

Basic properties of fluids. Hydrostatic forces on plane and curved surfaces. Stability of immersed and floating bodies. Velocity and acceleration in fluid motion. Continuity equation. Rotation, vorticity and circulation concepts. Velocity potential and stream function. Euler and Bernoulli equations in ideal flow. Momentum and moment-of-momentum equations and some applications.

INS-315 STRUCTURAL ANALYSIS I (4+0)

Loads and load specifications. Analysis statically determinate structures. Influence lines for statically determinate structures. Simple beams, three hinged arches, trusses, cables and frames. Displacements and deformations in statically determinate structures.

INS-317 SOIL MECHANICS I (3+0)

Index properties and classification of soils. Hydraulic properties, permeability in soils. Compaction of soils. Pore pressure, effective stress, total stress.

INS-331 TRANSPORTATION ENGINEERING I (3+0)

Definitions. Planning and surveying for highway projects. Principles of highway location. Vehicles. Geometric design of highways. Grading. Vertical curves. Planning of intersections. Substructure. Drainage.

INS-333 ENGINEERING ECONOMY (4+0)

The definition of engineering economy and terminology, cash-flow diagrams, time value concepts, interest, nominal and effective interest rates, inflation and impact on cash flow, activity measurement methods, comparison of alternatives, depreciation methods, replacement analysis, break-even analysis, economical feasibility report.

CIVIL ENGINEERING DEPARTMENT 6. SEMESTER COURSES

INS-306 STRUCTURAL ANALYSIS II (4+0)

Analysis statically indeterminate structures: force method and slope deflection method. Influence lines for statically indeterminate structures: moment-distribution method. Approximate methods of structural analysis subject to lateral loads. Introduction to matrix methods of structural analysis.

INS-312 FLUID MECHANICS II (4+0)

Laminar and turbulent flow. Boundary layer. Secondary flow. Laminar and turbulent flows in pipes. Hydraulic analysis of pipe networks. Unsteady flow in pipes. Open channel flow. Uniform flow, best hydraulic section, specific energy. Hydraulic jump. Gradually varied flow. Dimensional analysis. Hydraulic similarity.

INS-316 HYDROLOGY (4+0)

Hydrologic cycle. World's water budget. Mechanisms of evaporation and precipitation. Drainage area and its boundaries. Average area and temporal precipitation. Rainfall runoff relationships. Measurements of precipitation and streamflow. Unit hydrograph theory. Flood frequency analysis.

INS-318 SOIL MECHANICS II (3+0)

Shear strength of soils. Consolidation and settlement. Lateral earth pressure. Stress distribution in soils. Slope stability. Earth retaining systems.

INS-320 REINFORCED CONCRETE II (4+0)

Dimensional limit state design of reinforced concrete members. Two way slabs on stiff beams. Flat plates and flat slabs. Interaction of two-way slab systems with beams and columns. Use of equivalent frame method of slab analysis. Analysis and design of footings: rectangular column footings, wall footings, and cantilever footings.

INS-332 TRANSPORTATION ENGINEERING II (3+0)

Normal and light pavement surfacing. Sandy, gravel, clayey road ways. Macadam roads. Stabilized roads. Bituminous concrete. Mix design. Preparation and care of asphaltic concrete. Roads economic analysis of highways.

CIVIL ENGINEERING DEPARTMENT 7. SEMESTER COURSES

INS-403 HYDRAULIC STRUCTURES I (4+0)

Definition of water resources engineering. Classification of hydraulic structures, water supply and reservoirs. Reservoir planning. Introduction to dam engineering, design principles of concrete, earthfill, etc. dams. Water intake works and intake structures. Design of spillways and terminal structures. Flood control and protection.

INS-413 WATER SUPPLY AND SEWERAGE (4+0)

Determination of all types of water demand. Assessment of available water resources. Conveyance of water. Water tanks. Water distribution network. Sewer systems. Fundamentals of urban hydrology. Design of storm water drainage systems.

INS-417 STEEL STRUCTURES (4+0)

Engineering properties of steel. Joining parts. Rivets. Welding. Tension members. Compression members. Members under combined stresses. Composite beams. Trusses. Bridge systems.

INS-427 CONSTRUCTION PROJECT MANAGEMENT I (3+0)

Introduction of building regulations. Choosing building land and place. Preparing the drawings and technical specification. Drawing of the construction contract.

INS-429 REINFORCED CONCRETE PROJECT (2+2)

Analysis and design concrete building. Details of floors, beams, columns, stairways etc.

INS-431 SOIL MECHANICS III (3+0)

Pressure distribution beneath the foundations, rigid and flexible foundations. Consolidation theory. Evaluation of coefficient of consolidation by log-time and root-time methods. Loading under drained and undrained conditions. Slope stability. Ground improvement techniques.

INS-433 INTRODUCTION TO EARTHQUAKE ENGINEERING (3+0)

The earthquakes. Earthquake waves. Measurement of ground motion. Seismic regions. Intensity and isoseismal of an earthquake. Magnitude and energy of an earthquake. Richter's scale. Vibration isolation. Vibration measuring instruments. Single degree of freedom systems. Equation of motion. Free vibrations of undamped and damped systems of single degree of freedom. Forced vibrations of undamped and damped systems. Multi degrees of freedom system. Vibration absorber. Earthquake motion. Strong motion earthquakes. Definition and evaluation of earthquake spectra. Mode Superposition Technique for the earthquake analysis of the multi degree of freedom systems. Seismic design of structures. Philosophy of design. Turkish specifications for analysis and design of structures against earthquakes.

INS-435 PROJECT PLANNING AND CONTROL (3+0)

Introduction to construction time and cost management. Planning and control techniques used in construction management. Case studies of construction planning by using MS PROJECT and PRIMAVERA.

CIVIL ENGINEERING DEPARTMENT 8. SEMESTER COURSES

INS-410 IRRIGATION AND DRAINAGE (3+0)

Diversion dams. Fundamentals of reclamation. Modification of the natural distribution of water higher crop production. Design of irrigation and drainage system layouts. Economic evaluation. Operation and maintenance.

INS-416 FOUNDATION ENGINEERING (4+0)

Subsurface investigations, boring and sampling procedures, in-situ test procedures. Foundation materials. Spread foundations, single footings, combined footings, raft foundation (radia general), deep foundations. Foundation excavation, safety bracing of open cuts, security of buildings adjoining and excavation. Foundation settlements.

INS-418 CIVIL ENGINEERING LABORATORY (1+2)

Stress-strain relation of concrete, Tensile strength of concrete. Bending properties of beams. Behaviour of reinforced concrete beams. Venturimeter, Orifis, Impulse-momentum experiments. Picnometer test. Determination of consistence of soils, relative stiffness of soils, garnulometry analysis, hydrometer experiment. Proctor tests. Density determination of soils with sand cone method. Unconfined compression test. Shearing box experiment. Oedometer test.

INS-424 HYDRAULIC STRUCTURES II (4+0)

Hydraulic structures and water surface profiles in channels and tunnels. Design of hydro-power plants, intake structures, tunnels, surge tanks, penstocks, turbines. Economic analysis of water supply systems.

INS-428 CONSTRUCTION PROJECT MANAGEMENT II (3+0)

Estimation of the construction cost. Bidding and awarding process, project planning and scheduling. Supervision of the construction process. Preparing of the payment requests. Healthy and safety for construction works.

INS-430 STEEL STRUCTURE DESIGN (3+0)

General information about various types of steel constructions. Computations and design works of a steel roof.

INS-432 CONSTRUCTION LAW (3+0)

Introduction to construction law, practical issues and problems. Laws, contractual methods and specifications related with construction industry.

INS-434 OCCUPATIONAL HEALTH AND SAFETY (3+0)

The importance of occupational health and safety for employees, organizations and national economy. Related legal procedures in Turkey. Personal protective equipment requirements. Responsibilities of civil engineers related with health and safety applications on site. Related International Standards. Visual examples like photographs, films, animations related with health and safety implementations.