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| **2018-2019 ENGLISH COURSE CATALOGUE**  |
| **FACULTY** | **FACULTY OF ENGINEERING** |
| **DEPARTMENT** | **CIVIL ENGINEERING** |
| **Course Code** | **Course Name** | **ECTS** | **Course Content** |
| TRD111 | Turkish I  | 2 | What is language? Importance of language and its place in a nation’s life, language-culture relationship. Definition of grammar, function of grammar and departments of grammar. Phonetics: sounds and audio features of Turkish. Morphology; formal properties of Turkish (roots-adds). Words and word phrases. General information about composition, subject, perspective, ideas, main and ancillary ideas, paragraphs, intellectual order. Written expression, paragraph, the content and types (entrance, development and conclusion paragraphs). Expression forms, explanatory, descriptive, argumentative, narrative expression. Written expression; petition writing, quoting, footnotes and bibliography writing. Oral expression; speech and speech types (prepared speeches, panel, and discussion policies). Literary types; artistic (poetry, short stories, novels, theater and intellectual (articles, paragraphs, essays, criticism, interviews…). Reading and studying the works that about literature and idea world. Analyzing an editing text (story, novel, theater). |
| ATA111 | History of Turkish Revolution I  | 2 | This course covers the analysis of the causes and the consequences of the First World War; the searches for independence of the Turkish nation in Anatolia and salvation of the Turkish lands that were occupied after the Armistice of Montrose; the development and activities of Nationalist militias and the societies against them; the evaluation of the congress administrations that were formed after 19 May,1 919 in terms of their form and content; the structure of the Grand National Assembly and the process through which it gained legitimacy; the leadership of Turkish War of Independence; Treaty of Lausanne, and the Establishment of the Republic. |
| CHM101 | Chemistry | 5 | Properties of Matter, Fundamental Laws of Chemistry, The Atomic Theory, Electron configuration, The concept of the mole, The Periodic Table, Chemical Compounds, Thermochemistry-enthalpy-entropy, internal energy, Solutions and their physical properties, Chemical Kinetics-Determination of the rate of reaction, Chemical equilibrium, Acids and Bases, Electrochemistry, Batteries and Electrolysis, Redox reactions |
| PHYS113 | Physics I  | 5 | Vectors. Kinematics. Newton’s Law of Motion. Work and energy. Conservation of energy. Linear momentum and its conservation. Rotation of rigid bodies about a fixed axis. Rotational kinetic energy. |
| MATH113 | Mathematics I | 6 | Functions and Their Graphs, CombiJring Functions; Shifting and Scaling Graphs, Trigonometric Functions. Rates of Change and Tangents to Curves, Limit of a Function and Limit Laws, The Precise Definition of a Limit, One-Sided Limits, Continuity, Limits Involving Infinity; Asymptotes of Graphs. Tangents and the Derivative at a Point, The Derivative as a Function, Differentiation Rules, The Derivative as a Rate of Change, Derivatives of Trigonometric Functions, The Chain Rule, Implicit Differentiation, Related Rates, Linearization and Differentials. Extreme Values of Functions, The Mean Value Theorem, Monotonic Functions and the First Derivative Test, Concavity and Curve Sketching, Applied Optimization, Antiderivatives. Area and Estimating with Finite Sums, Sigma Notation and Limits of Finite Sums, The Definite Integral, The Fundamental Theorem of Calculus, Indefinite Integrals and the Substitution Method, Substitution and Area Between Curves, Volumes Using Cross-Sections, Volumes Using Cylindrical Shells, Arc Length, Areas of Surfaces of Revolution. Inverse Functions and Their Derivatives, Natural Logarithms, Exponential Functions, Indeterminate Forms and L'Hopitai's Rule, Inverse Trigonometric Functions, Hyperbolic Functions. |
| CE101 | Introduction to Civil Engineering | 6 | The primary purpose of the class is to provide understanding the concepts of various disciplines of Civil Engineering in introductory level. The course objectives are: obtain information about Civil Engineering education, and curriculum at Okan University, understand the responsibilities of a Civil Engineer, understand the ethical and professional responsibilities of a Civil Engineer, inquire information about various disciplines of Civil Engineering by reading pre-selected papers in outstanding projects, learn the technical words in various disciplines of Civil Engineering to prepare for the classes that you will take during your education, learn to be a team member by working on class presentations with your class mates in your group, improve presentation skills, and ability to convey message. |
|   | Foreign Language Elective | 4 | Every semester various foreign language classes (i.e. German, Russian, Chinese, Arabic, and advance English) offered at the university. Students can select the language of interest. |
| MATH215 | Mathematics III | 6 | Systems of linear equations; Solution sets of linear equations; Linear dependence and independence; Matrix Algebra; Inverse of a matrix and its characterization; Partitioned matrices; Determinants and their properties: Calculation of determinants; Column and row expansions; Minor and cofactors and inverse matrix; Cramer’s rule; Vector spaces:Subspaces, null spaces and column spaces (Image); Basis and coordinate transformations; Linear transformations and their representations; Representation of coordinate transformation; Eigenvalues and eigenvectors : Characteristic polynomial and Cayley-Hamilton Theorem; Diagonalization of linear transformations and matrices; Matrix polynomials; Diagonalizaton of symmetric matrices and projections; Generalized eigenvectors and eigenspaces; Inner product spaces : Orthonormal sets, Gram-Scmidt process; Singular value decomposition; Pseudo inverse; Least squares |
| ME201 | Computer Aided Technical Drawing | 5 | Introduction to computer aided technical drawing. Geometrical constructions. Principles of orthographic projection; projection of principal views from three dimensional models. Drawing techniques for basic manufacturing processes and standard features. Projection of third principal view from two given principal views; free hand drawing techniques. Three-dimensional drawing techniques; simple shapes, inclined surfaces, skew surfaces. Principles of dimensioning. Principles of sectioning; full and half sections. Further work on sectioning, conventional practices. Solid Drawing |
| CE201 | Strength of Materials I | 6 | Definition and principles of statics, planar forces, supports on the plane, trusses, cables, friction, forces in the space. Definition of the strength of materials and its principles, stress, deformation and strains, stress - strain relations, strength hypotheses, internal forces in the bars and diagrams, normal force, simple shear, torsion of the circular sections, moments of inertia, simple and nonsymmetric bending, bending with shear, elastic curve, combined loadings. |
| CE205 | Materials Science | 6 | Introduction to materials science and engineering, classification of materials. Atomic structure and interatomic bonding: ionic bonding, covalent bonding, metallic bonding, Van der Waals bond. The structure of crystalline solids: crystal structures, crystallographic points, directions and planes, crystalline and noncrystalline materials. Imperfections in solids: point defects, miscellaneous imperfection. Diffusion. Mechanical properties of metals: tensile test, stress-strain relations, brittle behavior, ductile behavior, shear effect, hardness. Dislocations and strengthening mechanisms: recovery, re-crystallization and grain growth. Failure: ductile fracture, brittle fracture, fatigue, creep. Phase diagrams. |
| CE217 | Dynamics | 7 | Introduce the principles of engineering mechanics and their applications in the design and analysis of mechanical systems. Determine the kinematic parameters, position, velocity, and acceleration of a moving object. Understand the difference between velocity, acceleration, angular velocity and angular acceleration. Represent a mechanical system using free body diagrams. Understand how unbalanced forces lead to the movement of objects that can be treated as particles, and analyze the basic aspects of this process. Determine unbalanced forces and kinematic parameters of mechanical systems by using the principles of mechanics. Analyze basic aspects of motion of rigid bodies consisting of connected links, rollers, pins and sliders. Understand how unbalanced forces lead to the movement of the center of mass of rigid bodies, and analyze the basic aspects of this process. Analyze the basic aspects of how this leads to the spinning, rotation of rigid bodies. |
| MATH220 | Numerical Methods | 4 |   |
| CE301 | Hydraulics | 7 | Water Flow in Pipes: Forces in pipe flow, energy in pipe flow, friction head loss-discharge relationships, types of local head losses. Pipelines and Pipe Networks: Pipelines connecting two reservoirs, Hardy-Cross method, water hammer phenomenon in pipelines. Water Pumps: Centrifugal, propeller, jet type of pumps, pumps in parallel or in series. Water Flow in Open Channels: Flow classifications, uniform flow in open channels, energy principles, hydraulic jumps, gradually varied flow, hydraulic design of open channels. |
| CE303 | Soil Mechanics I | 6 | Introduction to Geotechnical Engineering, Rock Cycle and the Origin of Soil, Soil-Particle Size, Clay Minerals, Specific Gravity, Weight-Volume relationships, phase diagrams, Plasticity and Structure of Soil, Classification of Soil, General principles of soil compaction, field compaction, Permeability, Bernoulli’s Equation, Darcy’s Law, Laplace’s Equation of Continuity, flow nets, Seepage calculation from a flow net, In-Situ Stresses, Stresses in a Soil Mass, stress increase due to loading, fundamentals of consolidation, one-dimensional laboratory consolidation test. Laboratory sections of the class includes grain size distribution (Sieve and Hydrometer Analyses), moisture content, specific gravity, Atterberg Limits (Liquid Limit and Plastic Limit), standard proctor, sand cone, constant and falling head permeability, and incremental loading Consolidation tests. |
| CE315 | Earthwork and Railway Construction | 4 | Introduction to earthworks. Volumes of fills and cuts. Mass diagram. Optimization of earth moving. Excavation methods and machines. Excavators and dampers. Introduction to railroad engineering. Train dynamics. Geometric standards of track. Gradients, curves, transition curves, location of track, superstructure elements and materials. Layout of track. |
| CE319 | Theory of Structures I | 5 | General concepts. Analysis of statically determinate structures. Determination of internal forces, internal force diagrams. Analysis for moving loads: influence lines. Analysis of basic statically determinate systems: multi-span compound systems, three-hinged frames and arches, trusses. Principle of Virtual Work. Computation of deformations and displacements for statically determinate structures. |
| BBA222 | Entrepreneurship Applications | 3 | Principals of entrepreneurship, Strategic management for entrepreneurship, creativity, human resources management and communication for entrepreneurs, Business Planning, Entrepreneurship in Turkey / Success stories. |
| CE445 | Reinforced Concrete I | 8 | Reinforced concrete members. Concrete, reinforcing steel. Mechanical properties of concrete and steel. Mechanism of bond transfer. Development of anchorage and splicing of reinforcement. Loads and load effects. Structural failure providing safety in reinforced concrete. Material factors. The load factors. Load groups. Mechanics of reinforced concrete beam. Under-over reinforced beam. Balanced beam. Ultimate strength design. Analysis of reinforced concrete beams. Analysis of flanged beams. Column capacity. Eccentrically loaded columns. Column interaction diagram. Bi-axially loaded columns. Tied and spiral columns. Diagonal tension failure of beam without stirrup. Load transfer in a cracked beam. Shear reinforcement. Shear design procedures. Behavior of reinforced concrete members subjected to torsion. Design for torsion. Shear and moment. Analysis and design of slender columns. Determination of moment magnification factor. Elastic design assumptions. Elastic analysis of beams with rectangular cross-sections. Frames, beam-column joints. Redistribution. General construction knowledge. |
| CE497 | Civil Engineering Design | 4 |   |
|   | **Elective Courses** |   |   |
| CE203 | Engineering Geology | 5 | Rock characteristics. Discontinued structures. Engineering geology maps. Mass Movements. Dam, tunnel and foundation geologies. Excavation and excavations safety. Industrial minerals and rocks. Effects of groundwater on engineering applications. Importance geological knowledge in rural and urban planning |
| CE307 | Construction Engineering and Management | 5 | Construction industry overview and profile. Types of contracts and project delivery methods. Planning, scheduling, CPM and cost estimating. Construction risks and construction project management. Equipments and materials. |
| CE312 | Computer Aided Structrual Modelling and Analysis | 5 | Introduction to computer aided structural modeling and an overall view for the analysis background. Definition of loads, load groups, and load combinations. Definition frame, area and volume elements and their fields of use. Modeling of frame structures and analysis under vertical, seismic, temperature, creep and shrinkage loads. The effects will be discussed thoroughly. Modeling of buildings with shear walls and shear wall buildings such as tunnel form buildings. Modeling of foundation settlement and foundation rotation. Modeling of mat foundations. Modeling of slabs, and vibration control. Modeling under seismic forces, Equaivalent Elastic Force Modeling under seismic forces, Natural Frequency of a building and the Spectral Analysis |
| CE323 | Composite Materials | 5 | Composite material structure and processing, fibre reinforced composite, particulate reinforced composite, mechanical models of internal structure, mechanical properties, durability and degradation of materials, fibre orientation, mix optimization for fibre reinforced composites, failure modes, biaxial strength theories |
| CE403 | Water Supply and Sewage Systems | 5 | Importance of water supply and sewerage systems. Water resources. Stages of water from the source to the disposal of the waste water. Water demand. Methods of water diversion. Storage of water. Intake types. Typical problems encountered in supply lines. Computation of rainwater drainage systems. Computation of wastewater (sewerage) systems. Treatment and disposal of wastewater. |
| CE405 | Steel Structures | 5 | Historical development of steel structure, advantage and disadvantage of steel usage in structural design, application areas of steel products. Properties of structural steel and general information about steel design procedures. Reliability, loads and load combinations. Connections, connecting members, riveted, bolted, welded connections and related design principals. Tension member design, its splice and employment principles in structural system. Design principles for compression members including built-up compression members and batten plates, lacing members design. Design procedures for beam-columns. Design principals of roof truss, purlins and stability bracing systems. Design procedure for beams having rolled and built-up rolled cross sections, design rules for their splice, bi-axial bending, procedures for lateral buckling control. |
| CE407 | Water Resources Engineering | 5 | Introduction to water resources and equilibrium of river channels. Sediment transport. Dams. Reservoir. Diversion weirs and gates. Intake structures. Energy dissipators. Hydroelectric power. Irrigation. Drainage. Flood control. River regulation. Economic analysis in water resources. |
| CE421 | Rock Blasting Technology For Construction | 5 | Theory and application of explosives in the mining and construction industry; explosives, initiating systems, characteristics of explosive reactions and rock breakage, fundamentals of blast design, drilling and blasting, regulatory and safety considerations, environmental problems produced from, blasting-vibration, air blast. |