REPUBLIC OF TURKEY
KONYA TECHNICAL UNIVERSITY and SELCUK UNIVERSITY
ENGINEERING AND NATURAL SCIENCES FACULTY
CIVIL ENGINEERING DEPARTMENT
2015-2016 / 2016-2017 / 2017-2018 / 2018-2019 / 2019-2020 / 2020-2021
2021-2022 / 2022-2023 / 2023-2024
ACADEMIC YEARS'
NORMAL EDUCATION AND SECOND EDUCATION COURSE CONTENTS

1st CLASS 1st SEMESTER

	Course Code	Course Title	Semester	ECTS
	1204112-1214112	**Mathematics 1**	**1**	**7**
Objective	To provide students with sufficient knowledge of mathematics to solve engineering problems and to develop students' analytical thinking and ability to produce solutions to problems.			
Content	Sets, real numbers, intervals, inequalities, neighborhoods, coordinates. Functions; definition, definition and image sets, definition of 1-1 surjective functions, finding inverse function, composition of functions. Special functions; definitions of rational, irrational, trigonometric, inverse trigonometric, exponential, logarithmic, hyperbolic and inverse hyperbolic functions. Limit of functions; definition, right and left limits, basic theorems about limits, limit of some special and trigonometric functions. Continuity of functions; definition, theorems about continuous functions. The concept of derivative; derivative rules, derivative of compound and inverse function, derivative of trigonometric functions. Derivative of exponential, logarithmic, hyperbolic and inverse hyperbolic, implicit and parametric functions; higher order derivatives. Applications of derivative; geometric meaning of derivative, absolute and local extreme values, maximum-minimum problems. Physical meaning of derivative, concavity, Rolle and Mean Value theorems, removal of uncertainties with L'Hospital Rule. Asymptotes of a curve. Graph drawings; graphs of rational, irrational, exponential logarithmic, trigonometric, hyperbolic parametric functions.		
	1204102-1214102	**Physics**	**1**	**7**
Objective	To teach the basic principles of physics to the students.			
Content	Physics and measurement. Vectors. Motion in one dimension. Motion in two dimensions. The laws of motion. Circular motion and other applications of Newton's Laws. Work and kinetic energy. Potential energy and conservation of energy. Linear momentum and collisions. Rotation of a rigid object about a fixed axis. Rotational motion and angular momentum. Static equilibrium and elasticity. Oscillatory motion. Universal gravitation.			
	1204103-1214103	**Chemistry**	**1**	**5**
Objective	Understanding the basic properties and importance of chemical concepts, teaching and applying the basic chemical methods to analyze the engineering problems involving chemical concepts.			
Content	What is chemistry? Scientific method. Basic properties of matter. Periodic properties. Chemical bond. Properties of molecules. States of matter. Oxidation-reduction reactions. Chemical kinetics. Chemical balance. Chemical balance. Chemical thermodynamics.			
	1204113-1214113	**Introduction to Civil Engineering**	**1**	**2**
Objective	Presentation of civil engineering interests, problems and solutions to be encountered in engineering life, business areas, introduction and endearment of civil engineering.			
Content	Introduction of Civil Engineering Department. Introduction to civil engineering. Historical development of civil engineering. The study areas of civil engineer. Main disciplines of civil engineering. Laws and regulations, standards, materials.			

	1204107-1214107	Turkish Language 1	1	2
Objective	To develop the Turkish word, grammar, meaning and writing skills of students.			
Content	What is language? Origin of languages. Language-thought relationship. Language-culture relationship. Language-society relationship. World languages and Turkish. History of Turkish Language. Sound information. Sound properties of Turkish words, emphasis, syllables. Pattern knowledge. Derivational affixes, inflectional suffixes. Words, types of words. Sentences, types of sentences. Spelling rules.			

	1204108-1214108	Ataturk's Principles and Reforms History 1	1	2
Objective	To explain the foundation of The Republic of Turkey as a secular and unitary nation-state structure in the light of fights and the reforms carried out under the leadership of Mustafa Kemal Ataturk after the end of the Ottoman Empire. To teach the students to develop their classification, description, explanation and analysis skills in solving the modern problems at society, individual and country levels by adapting and accommodating the Ataturk's Principles and Reforms according to the national bases in intelligence, science and modernity norms.			
Content	The reasons for the dissolution of the Ottoman Empire, renovation movements in the period of regression, democratization and the road to the republic (The Edict of Gulhane, The Imperial Reform Edict, 1st and 2nd Constitutional Era). Thought movements in Ottoman Empire (Ottomanism, Turkism, Pan-Islamism, Westernism). Minorities in Ottoman History, activities. Emergence of Armenian Issue, its reflections on today. First World War, reasons and Ottoman Empire's entry to the war. Armistice of Mudros, its conditions and evaluation of the armistice in terms of Turkey. The condition of our country under invasions and the reaction of Mustafa Kemal Pasha. Mustafa Kemal Pasha's landing on Samsun, his contact with military and local administration. First steps of War of Independence; Amasya Circular, Erzurum and Sivas Congresses. Foundation of Kuva-yi Milliye and National Pact. The opening of TBMM (The Grand National Assembly of Turkey). TBMM, taking the control of the management of the War of Independence. The revolts against TBMM during the War of Independence.			
	1204150-1214150	**Foreign Language 1 (English)**	**1**	**3**
Objective	To improve students' four language skills (speaking, listening, reading and writing) to reach level B1.1 (CEFR). In addition, to provide students with the confidence to communicate in English in social, professional and academic subjects.			
Content	Basic concepts in English. Nouns. Pronouns. Adjectives. Adverbs. Verbs. Regular and Irregular Verbs. Modal Verbs. Passive Voices. Causatives. Gerunds. Infinitives. Noun clauses. Auxiliaries. Idioms. The Present Simple Tense. The Present Continuous Tense. Future Tenses with “will”, “be going to”. The Simple Past Tense. The Past Continuous Tense. Used to. Prepositions. The definite and indefinite articles. The Present Perfect Tense.			
	1204114-1214114	**Occupational Health And Safety 1**	**1**	**2**
Objective	To teach the safety culture to the students by giving information to ensure the occupational health and safety in working life.			
Content	The concept of “Occupational Health and Safety” (OHS) and various definitions. Occupational Health and Safety overview and safety culture. National and International Organizations, their duties and powers, international conventions. OHS in the laws of the Republic of Turkey. OHS services. OHS Management Systems. Work accidents and occupational diseases, their causes and precautions to be taken. Case discussions. Health and Safety Signs, Personal Protective Equipment. Hazard and risk concepts, risk factors. Risk management and assessment. Risk management and assessment. Case Discussions.			

1st CLASS 2nd SEMESTER

	1204202-1214202	**Statics**	**2**	**6**
Objective	Teaching the basic concepts and definitions of statics, the basic problems of statics by considering the solution proposals, the calculation of truss systems and ideal truss system design, the friction force, the moment of gravity and inertia, the transporter systems, the normal force, shear force and bending moment on the beam elements of the load bearing system, the static analysis approaches of the cables exposed to axial tensile force.			
Content	Introduction to statics, basic concepts and basic principles of statics. Basic problems of statics, solution proposals and types of supports. The collection and equilibrium conditions of the force system applied at one point. The moment of a force with respect to a point and the theory of a force pair. Theorems about the pair of forces, and bringing the space forces system to a center. The equilibrium conditions of the space forces system. Exceptions and Varignon Theorem. Examples of the equilibrium conditions of the planar force system. Center of gravity calculations, examples. Moment of inertia calculations, examples. Shear force and bending moment calculations at beams. Calculations of truss systems. Nodes Method and Ritter Method. Calculation of tensile force at suspended cables. Frictional force.			
	1204212-1214212	**Mathematics 2**	**2**	**7**
Objective	To provide students with sufficient knowledge of mathematics to solve engineering problems and to develop analytical thinking and ability of the students to produce solutions to the problems.			
Content	Indefinite integral, area. Upper sum, lower sum. The fundamental theorem of integral. Inequalities and improper integrals. Integral techniques, applications (curve length, surface of revolution area, surface of revolution volume). Work and moment. Polar coordinates. Taylor's formula and remainder term calculation. Convergence of series. Series with positive terms. Convergence and divergence tests. Power series. The derivative and differential of power series and some applications.			
	1204213-1214213	**Building and Architecture Information**	**2**	**2**
Objective	To teach the general concepts and principles that should be known about architecture and building as a civil engineer by defining the professional relationship between architecture and civil engineering.			
Content	Defines and architectural knowledge. Zoning regulations-plot, garden definitions. Zoning situation-example solutions. Documents required for obtaining a building permit. Classification of building-structure. Foundation ground-soil studies-excavation works. Fortification-foundations. Architectural project review. Architectural project carrier system review. Carrier system solution application. Stairs-ramps-elevators. Stairs application. Roofs. Roofs-application.			
	1204225-1214225	**Computer Aided Technical Drawing**	**2**	**6**
Objective	To draw three views of a given object using technical drawing materials, to draw perspective from three views, to make a section from perspective, to teach using Ropito pen, to make drawings with the help of AutoCad program.			
Content	Introduction of technical drawing materials, introduction to the drawing program on the computer and the introduction of the program. Line work, editing the drawing screen in AutoCad, introduction of basic drawing commands and menus. Line work, the introduction of basic editing commands on the computer, the application of basic drawing and editing commands. Line and compass work, geometric drawings and applications on the computer. Projection study, presentation of layers in computer and application examples. Explanation and applications of 3 views from perspective, dimensioning and text menus on the computer. 3 perspectives, geometric drawings and applications on the computer. 3 perspective extraction from view, technical drawings on computer, truss drawing application example. Line work with a rapido pen, technical drawings on the computer, application example of reinforced concrete beam detail. Dimensioning work with rapido pen, technical drawings on computer, mold plan application example. Sectioning from perspective with rapido pen, technical drawings on computer, application example of column application plan. Sectioning from perspective with rapido pen, technical drawings on computer, application example of basic mold plan. Working on scaling, technical drawings on the computer, application example of basic beam detail. Floor plan drawing with rapido pen, scaling and printing of technical drawing plans on computer.			
	1204207-1214207	**Turkish Language 2**	**2**	**2**
Objective	To develop the Turkish word, grammar, meaning and writing skills of students.			
Content	The use of adverbs and prepositions in Turkish. Sentence knowledge (word groups in Turkish). The elements of a sentence, sentence analysis, formation and application. Oral composition types and applications. Speech plan, prepared speech. Oratory rules. Unprepared speech types and applications. Narration styles in composition and applications. Written composition types and applications (event essays). Incomprehensibility and sentence anomalies, their corrections. Rules for preparing scientific articles. Reading and examining the works related to literature and the world of thought, and rhetoric applications.			

	1204208-1214208	**Ataturk's Principles and Reforms History 2**	**2**	**2**
Objective	To teach the Principles of Ataturk that constitute the basis of the state by explaining the conditions under which the Republic of Turkey was founded. To explain the efforts of Ataturk for the constitution of international peace, his understanding of nationalism rejecting racialism, his revolutionary personality and leadership, what a great statesman he was as much as his military aspect.			
Content	Kuva-yi Milliye, Eastern Front, Gumru Treaty, Southern Front, Gaziantep, Maras. Adana, Urfa Fronts. Allied States' partition projects for Turkey. San Remo Conference. Treaty of Sevres. Transition to the Regular Army. First Battle of inonu. London Conference. Treaty of Moscow. Turkey-Afghanistan Treaty of Alliance. Second Battle of inonu. Afyon-Eskisehir-Kutahya Battle. Mustafa Kemal Pasha became the Commander-in-Chief. National Liability Orders. Sakarya Battle. Great Offensive. Commander-in-chief issue. Insurrection in Greece. Turkish-English military crisis before the armistice. Mudania Armistice. Lausanne Peace Treaty provisions. Turkish Reform. Reforms in politics, abolition of the sultanate, proclamation of the republic, abolition of the caliphate. Constitutional movements, Turkish Constitution of 1921. 20th April 1924 Constitution. Groups formed in TBMM (Grand National Assembly of Turkey) and political parties, socialist-communist groupings, Associations for Defense of National Rights. Political parties after the Turkish War of Independence, transition to the multi-party period, foundation of People's Party, Progressive Republican Party, Liberal Republican Party, other party foundation attempts. Reactions against the regime, Sheikh Said Rebellion, Law on the Maintenance of Order, re-establishment of independence courts, assassination to Ataturk in izmir. Reform in law, adoption of civil law, reform in education, Law on Unity of Education, Ataturk and Turkish History thesis, Turkish Language Reform, reforms in social areas, Dress Revolution and Hat Revolution, Closure of Lodges, Zawiyas and Tombs, changes in clock and calendar systems, changes in length and weight measurements, acceptance of women's rights, national days and vacation days. Ataturk's Principles and Reforms, national sovereignty, domination, complete independence, Republicanism, Nationalism, Reformism, Secularism, Islam and secularism, regulations on secularism in Ataturk period, Ataturk and secularism, Populism, Statism. Foreign policy in Ataturk period, general properties. Turkish foreign policy in 1923-1930 and 1930-1938 periods, Balkan Pact, Italian danger in the Mediterranean, Montreux Straits Convention, relationships with Islamic World and Saadabad Pact, solution of Hatay issue.			
	1204250-1214250	**Foreign Language 2 (English)**	**2**	**3**
Objective	To train individuals who can follow scientific and technological developments in their own departments through publications in foreign languages, communicate comfortably with people from different nations, and conduct joint and independent research and development activities by exchanging information with them by using their four language skills effectively.			
Content	Planning a shopping trip, talking about shopping habits. Telling what you want in a store, writing a script for a video blog, presenting an idea for a new invention. Talking about your favorite food, designing a food truck. Telling what you want in a restaurant, commenting on an article on the Internet, planning a party. Discussing what to do in your city, talking about a trip you took. Giving advice and suggestions, writing advice about living in another country, planning a short trip. Comparing stores and what they sell, mentioning people in photos. Asking and giving ideas, writing paragraphs describing the photo, creating and presenting advertisements. Midterm. Talking about how to avoid danger at work, making predictions about your future. Identifying a medical problem and seeking help, writing an email to your future self, scheduling a reality TV show. Talking about experiences you've had and never had, about what you've done before and when you did it. Making and responding to requests, commenting on an infographic, creating a video or video blog. Talking about the weather, describing places, people and objects, asking and giving directions, writing simple instructions. Final Exam.			
	1204214-1214214	**Occupational Health and Safety 2**	**2**	**2**
Objective	Gaining information about the duties, authorities and responsibilities of the Civil Engineer, the basic regulations in the legislation in the construction sector, the measures to be taken to prevent work accidents in the construction sector.			
Content	Accidents in the Construction Sector and the place of OHS studies in the sector. Occupational Health and Safety Regulation in Construction Workplaces. OHS boards. Conservation policies. Precautions to be taken when working at height. Precautions to be taken in excavation works. Precautions to be taken in works carried out in closed areas. Measures to be taken in different constructions. Occupational health and safety in work equipment. Midterm. Contingency plans. Health and Safety plan and file. Case discussions, audit reports. Controls to be made in terms of OHS and documents to be issued. Case discussions, audit reports.			

2nd CLASS 3rd SEMESTER

	1204301-1214301	**Material Science**	**3**	**4**
Objective	To teach the general properties of construction materials.			
Content	Introduction to material science. Mechanical properties of materials. Internal structure and fracture theories of materials. Technological and physical properties. Properties of hollow materials. Properties of granular materials. Thermal properties. Acoustic properties. Harmful external effects and protection remedies.			
	1204353-1214353	**Dynamics**	**3**	**4**
Objective	To teach the mathematical formulas of dynamic problems, to develop the ability to identify and solve the kinetic and kinematic problems, to teach the kinematics and kinetics of moving systems and objects, to explain the basic concepts of vibration and to investigate the kinetics and kinematics of rigid objects.			
Content	Basic concepts. Particle kinematics and irregular motion. General curvilinear motion. Perpendicular components in curvilinear motion. Bullet motion. Normal and tangential components in curvilinear motion. Cylindrical components in curvilinear motion. Absolute dependent motion analysis of two particles. Analysis of relative motion of two particles with shifted axes. Particle kinetics; force and acceleration particle kinetics. Rigid object's planar kinematics. Planar kinetics of a rigid object. Kinetic equations of planar motion. Vibration.			
	1204304-1214304	**Strength of Materials 1**	**3**	**5**
Objective	To teach the use of the equilibrium conditions of rigid objects mechanics, the calculation of the reaction forces and internal forces by using balance equations and the sizing by using internal forces' calculation.			
Content	Basic principles of strength of materials, internal forces and diagram drawings, stress analysis, starin, stress-strain relationship, axial normal force state, shear force state, torsional state and moment of inertia.			
	1204312-1214312	**Mathematics 3**	**3**	**5**
Objective	To provide the ability to use advanced mathematical theories and approaches at the level of analysis in design, approach to solving problems and applications in the field of civil engineering.			
Content	Introduction to vector-valued functions. Parametric equations. Piecewise derivatives of multivariable functions. Multiple integrals and their applications. Exact differential in multivariable functions. Gradient, Divergence and Curl. Lagrange Multiplier. Conservative vector fields. Green's theorem. Stokes' theorem. Spherical and cylindrical coordinates. Line integral. Volume calculation. Surface areas and moments in three dimensions. Gamma functions.			
	1204325-1214325 Statistics and Numerical Analyses for Engineers		**3**	**5**
Objective	To develop students' skills in using mathematical and statistical methods in engineering.			
Content	Matrices and Determinants. Calculation of Matrix Inverse and Example Problems. Solution of Sets of Linear Equations. Solution of Nonlinear Equations. Digital approximation(Curve Fitting). Interpolation. Numerical Integral. Definitions related to statistics. Populations, Samples, Probability Distributions. Binomial Distributions. Poisson Distributions. Chi-Square Distributions. Normal distributions. Sample Problems.			
	1204330-1214330	**Geology for Civil Engineers**	**3**	3
Objective	To introduce general geological information. Determination of physical and mechanical properties of soil. To reveal the relationship between geology and civil engineering.			
Content	Definition and subject of geology, Geology-civil engineering relationship. Earth and its structure, Plate movements-1. Plate movements-2. Tectonic deformation of rocks. Fault, crack, fold. Rocks: igneous, sedimentary and metamorphic rocks-1. Rocks: igneous, sedimentary and metamorphic rocks-2. Crystallography-mineralogy. Earthquakes. Weathering: physical and chemical weathering. Engineering properties of my rocks: Physical and mechanical properties. Geological materials used in construction. Landslide (mass movements).			

	1204328-1214328	**Topography**	**3**	**4**
Objective	To teach the basic concepts of topography, to define its place and importance in civil engineering, to teach and apply the necessary information for solving engineering problems including topography issues.			
Content	Basic concepts and units of measurement. Scale concept. Mistakes. Simple measuring instruments and length measurements. Simple acquisition (land surveying) methods. Field accounts. Coordinate calculation. leveling Leveling calculations. Boy section, cross sections and construction works. Cross-sectional area calculation. Volume calculation. GPS. Map information reading and marking.			

2nd CLASS 4th SEMESTER

	1204402-1214402	**Construction Materials**	**4**	**4**
Objective	To introduce the important building materials especially concrete to the students.			
Content	Principles of preparation of construction materials test reports. Concrete as a construction material; definition of fresh and hardened concrete, expected performance from concrete, advantages and disadvantages of concrete. Binding materials; theory of binding materials, cement, types of cement, gypsum, lime pozzolan, a technical trip to a building materials fair, performing cement tests in the laboratory. Concrete aggregates; classification of aggregates, properties of aggregates, aggregate sieve analysis in the laboratory, specific gravity and water absorption tests, properties of water used in concrete production, properties of concrete, concrete mix calculations, preparation of concrete mix in the laboratory, concrete production, concrete quality control, a technical trip to a cement factory, concrete strength test in the laboratory, a technical trip to a ready-mixed concrete facility, control of concrete. Significant building materials; stones, metals, soil materials, organic polymers, wood and mortars.			
	1204403-1214403	**Strength of Materials 2**	**4**	**5**
Objective	Using the equilibrium conditions of rigid objects mechanics, calculating the reaction forces and internal forces with the help of balance equations. To make sizing using the calculation of internal forces.			
Content	Shear bending, shear center. Examination of elastic curve with various methods, the effect of shear. Normal force and bending, nucleus, second order theory. Bending torsion. Elastic stability, Euler states, buckling outside the elastic region, Omega method, approximate methods.			
	1204412-1214412	**Mathematics 4**	**4**	**4**
Objective	To introduce the basic concepts of first and higher order ordinary differential equations and their applications in engineering sciences and to give their solution methods.			
Content	Definition and classification of differential equations, initial value and boundary value problems. Differential equations that can be separated into their variables, homogeneous differential equations. Exact differential equations, integration factor (Euler multiplier). Linear differential equations. Bernoulli differential equations, Riccati differential equations. y. 1st order differential equations (Clairaut differential equations) (according to the dependent variable). Engineering applications of first order differential equations. Higher order linear differential equations (N. order linear differential equations with constant coefficients). Higher order linear differential equations (right-sided-Lagrangian rule). Cauchy-Euler differential equations, Euler, Legendre differential equations. Power series solutions of differential equations, Laplace transforms and their properties. Laplace transforms and their applications. Inverse Laplace transforms. Systems of normal linear differential equations (with constant and variable coefficients).			
	1204425-1214425	**Structural Analysis 1**	**4**	**5**
Objective	To teach the calculation and diagram drawing of the internal forces in isostatic beams, frame systems, arch and gerber beams, to calculate the displacements and draw the influence lines.			
Content	Introduction; structural and civil engineering, calculation according to elastic and bearing capacity theories, assumptions, classification of structural systems and loads, resultant calculation of single and distributed loads. Definitions in rod systems, nodal points, equilibrium equations, calculation of support reactions, isostatic, hyperstatic and labile systems. Internal forces/section effects, positive directions, section effect calculation, calculation of isostatic systems according to constant loads, section effect diagrams, inclined beams and drawing section effect diagrams. Articulated continuous beams, solution methods of articulated continuous beams, placement of joints, drawing internal force diagrams. Arches, three-joint belts, tensioned belts, three-joint frames. Classification of truss systems, truss system solution methods, joint point method, bar cutting method. Drawing lines of influence. Calculation of displacements with virtual work theorem.			

	1204427-1214427	**Soil Mechanics 1**	**4**	**4**
Objective	To teach basic soil mechanics concepts related to soils on which civil engineering structures are built.			
Content	Course Importance and General Information, Formation of Soils. Physical Properties of Soils. Applications (Physical properties of soils). Classification of Soils. Applications (Physical Properties of Soils). Laboratory applications (Physical properties and classification of soils). Ground water, total stress-pore water pressure-effective stress. Applications (Ground water, total stress-pore water pressure-effective stress). Permeability of Soils. Applications (Permeability of Soils). Laboratory applications (Permeability of soils). Water currents on floors. Applications (Water currents on floors).			
	1204428-1214428	**Fluid Mechanics**	**4**	**5**
Objective	To introduce the basic properties, place and importance of fluids in engineering applications. To teach and apply the methods used for the analysis of engineering problems involving fluids.			
Content	Introduction, Basic Concepts, Physical Properties of Fluids. Behavior against stresses, Viscosity. Applications of surface tension, capillarity, 1st and 2nd week subjects. Static of fluids (Hydrostatic), Variation of pressure with depth, Osmotic pressure. Manometers, Pascal's Principle. Manometers and Applications of Pascal's Principle, Hydrostatic lift. Objects floating on the water surface, Liquids in relative equilibrium, Applications on bodies floating on the water surface and liquids in relative equilibrium. Fluid kinematics, Lagrangian point of view, Euler point of view, Streamlines, Flow types, Flow pipe. Fundamental equations of one-dimensional currents, Continuity equation, Energy equation, Applications of Bernoulli's equation. Continuity and applications of Bernoulli's equation. Impulse-momentum equation, Forces on elbows. Water jet and its effect on blades, Pelton turbines. Applications of impulse-momentum equation. Two-dimensional flows, Applications related to two-dimensional flows.			
	1204429-1214429	**Engineering Hydrology**	**4**	**3**
Objective	To teach the measurements and calculations carried out to meet the needs of people and best use of water for various purposes and to teach the evaluation of these measurements and calculations.			
Content	Hydrologic definitions, hydrologic cycle. Meteorological data. Evaporation and transpiration. Precipitation. Infiltration. Surface flow. Flow measurements. Evaluation of flow measurements. Basin properties.			

3rd CLASS 5th SEMESTER

	1204502-1214502	**Reinforced Concrete 1**	**5**	**5**
Objective	To teach the behavior of reinforced concrete structural elements at a basic level.			
Content	Concrete, mechanical properties of concrete, tensile deformation properties of concrete, shear strength, modulus of elasticity of concrete, shear modulus, Poisson's ratio, local pressure. Behavior of concrete under multi-directional stresses, behavior of confined concrete, time-dependent deformation in concrete, reinforced concrete behavior and basic principles for its calculation, structural safety, elements under axial force, behavior of beams under simple bending effect, RC tabled beams, rectangular cross-sections with double reinforcement, bearing capacity of members under shear effect, inclined cracking strength, behavior of members with shear reinforcement.			
	1204503-1214503	**Steel Structures 1**	**5**	**3**
Objective	To deal with steel as a building material, to introduce the connection elements used in steel structures and to teach the design of joints, the design of tension members and their connections in steel structures by taking into account the provisions of the current regulation (PDCCSS-2016).			
Content	History of steel structures, steel as a structural material. Mechanical properties of structural steel, Structural steel loading conditions, design methods, Profiles. Advantages and disadvantages of steel structure, Application areas, Calculation method, Fasteners used in steel structures, Brief information about riveted joints - Bolted joints. Example solutions for bolted joints. Welded joints, calculation method of welded joints. Example solutions for welded joints. Steel members under the effect of axial tensile force - Tension members. Example solutions for tension members. Tension members splices. Example solutions for tension members splices. Steel members under the effect of axial compression force - Compression members. Example solutions for compression members.			
	1204523-1214523	**Soil Mechanics 2**	**5**	**4**
Objective	To teach the behavior of soil and the solutions to practical problems by the aid of the basic principles of soil mechanics.			
Content	Compaction of soils. Shear strength of soils. Applications (Compact+Shear strength). Laboratory applications (Compact + Shear strength tests). Vertical stress increments and their applications. Settlement and consolidation on floors. Consolidation theory and consolidation experiment. Applications (Settlement and consolidation + Laboratory applications). Lateral ground pressures. Retaining structures and Retaining systems. Applications (lateral ground pressures + retaining structures). Slope stability. Applications (Slope stability)			
	1204519-1214519	**Structural Analysis 2**	**5**	**5**
Objective	Explaining the solution of hyperstatic systems with different methods and diagram drawings.			
Content	Introduction. Solution of statically indeterminate systems using force method. Calculation of the temperature variations of statically indeterminate systems. Calculation of the support failures for statically indeterminate systems. Solution of the systems having fixed nodes by using slope-deflection method. Solution of the systems having not fixed nodes by using slope-deflection method. Solution of the systems having fixed nodes by using moment distribution method. Solution of the systems having not fixed nodes by using moment distribution method. Solutions with matrix displacement method (stiffness method).			

	1204535-1214535	**Hydraulics**	**5**	**4**
Objective	To give information about pipe and open channel hydraulics. To explain the place and importance of pipe and open channel hydraulics in civil engineering with examples. To give solution ways to the problems of pipe and open channel hydraulics and discuss their results.			
Content	Introduction to hydraulics, pipe hydraulics (flow in the pipe), boundary layer, flow types in pipes, laminar and turbulent flows, wall types, head (energy) loss, continuous and local head losses Moody diagram and applications related to head losses, elevated systems, wet environment and hydraulic radius, empirical formulas for uniform flows, Manning Formula, Williams-Hazen Formula, three-chamber systems, conduit lines, water networks, Hardy-Cross Method and its applications, flow in open channels, energy loss in open channels, Uniform open channel current, Empirical expressions, The concept of optimal cross section. Non-Uniform Currents, Specific Energy - Depth Relation. River Regime, Flood Regime, Flow-Depth Relationship, Cross-Section Changes. Channel Control Structures, Hydraulic Jump, Applications. Dimensional Analysis, Buckingham Pi Theorem, Rayleigh Method. Froude Models, Reynolds Models.			
	Social Responsibility Elective Course 1 (Non-Technical Elective Course 1)			
	1204536-1214536	**Traffic Safety (SEC 1)**	**5**	**3**
Objective	To give information about traffic safety at undergraduate level.			
Content	Introduction to traffic safety, traffic safety (TCK) accident black spots, analysis of accidents, factors causing traffic accidents. Safe Vehicle Training. Traffic and Environment. Traffic and Environmental safety. Safe Roadside Design Principles. Active and Passive Security Systems. Traffic Signs, Information signs. Traffic Signs, parking arrangement and warning signs. Intelligent Transportation Systems. Intelligent Transportation systems, Istanbul Metropolitan Municipality Traffic Directorate. First Aid and Response.			
	1204542-1214542	**Project Management and Planning (SEC 1)**	**5**	**3**
Objective	To teach the project planning techniques and their application to construction projects. To determine the optimum time and cost for the construction projects.			
Content	Factors necessary for a successful project management. Project management concepts, defining requirements, project manager, teams, project organization, project communication, project planning, scheduling, control and related costs. Software tools for project management.			
	1204538-1214538	**History of Science (SEC 1)**	**5**	**3**
Objective	To teach the importance of the history of science to the engineering students from different points of view. To gather scientific developments under a systematic system, and to endear the history of science using visual documents.			
Content	What is science? The area, structure and methods of science. Basic sciences, observation and measurement, the first universities in Europe in the middle ages, eastern science, the scientific revolution, science and industry, science and art. Science in the 19^{th} century and 20^{th} century. Today's scientific developments. Science and scientific developments in Islamic and Turkish geography .			
	Technical Elective Course 1 (TEC 1)			
	1204527-1214527	**Special Concretes (TEC 1)**	**5**	**3**
Objective	To introduce the concretes differing from normal concrete in terms of production techniques or properties.			
Content	Ready-mixed concrete. Concrete casting in cold weather and hot weather. Self-compacting concretes. Heavy concrete, lightweight concrete. Joint concretes, prefabrication concretes and heat treatment application. Exposed concrete, vacuum concrete, prepacked concrete, underwater concrete casting. Shotcrete, fibered concrete, airport concretes, high strength concretes.			

	1204528-1214528	**Wooden Structures (TEC 1)**	**5**	**3**
Objective	To introduce all kinds of building elements used in wooden buildings and to give information about the calculation methods and problem solutions.			
Content	History of Wooden Structures. Wood Safety Stress and Modulus of Elasticity. Wood Joints and Joining Tools. Calculation of unification tools. Studded connections and bolted connections. Modern Wedge Joints. Wooden Building Elements. Pressure bars and calculation. Calculation of beams and beams. Multi-piece beams.			
	1204529-1214529	**Masonry Structures (TEC 1)**	**5**	**3**
Objective	To explain the causes of damage, repair and strengthening methods of walls in masonry structures which are damaged due to various reasons and are likely to be damaged. To mention about the causes of damage and repair methods briefly by taking into account the important points of our country's earthquake code and the earthquake resistant design of masonry buildings.			
Content	Classification of masonry structures. Factors causing damage on the masonry structures. Methods used to determine the damages on the masonry structures. The design of masonry structures according to the codes. Damages at the slabs of the masonry buildings. Damages at the walls of the masonry buildings. Repair of masonry structures. Strengthening methods for the masonry structures. Strengthening of the foundations of the masonry structures. Strengthening of the entire of the masonry structure. An example for the strengthening process of a masonry building.			
	1204532-1214532	**Tunnel Engineering (TEC 1)**	**5**	**3**
Objective	To carry out the engineering studies required for the selection of tunnel excavation and support (fortification) systems, and to teach the methods and principles about the design process. To develop the knowledge and skills about the machines used in tunneling and to teach the tunnel excavation construction methods.			
Content	Introduction: Definition and history of tunneling, general introduction of tunnel projects, content, development and introduction of tunnel projects with typical examples. Tunneling terms, tunnel types. The importance of geology in tunneling and the review of the geotechnical properties of the rock environment, the examination of various rock classification systems. Geological, support and engineering factors affecting the tunnel. Design of tunnels, calculation of tunnel project costs. Effects of geological structures on tunneling (effect of faults, folds and layers). Tunneling in rock environment (hard and soft rocks). Tunneling in the soil environment (in cohesive and non-cohesive soils). Problems encountered during tunneling. Tunnel cut-close and blasting methods (tunnel opening methods). Tunneling machines and TBM. Damages in the tunnel and improvement of tunnel ground conditions. Ventilation in tunnels, lighting, traffic signaling, analysis of traffic systems, fire alarm and extinguishing systems, tunnel automation and radio systems, energy supply in the tunnel. Workplace safety and health in tunnels, support methods and sample applications in tunnels.			
	1204540-1214540	**Hydroelectric Facilities (TEC 1)**	**5**	**3**
Objective	To teach the energy production from the flowing water and its importance for the country and to give information about the current energy problems and pricing.			
Content	Energy, types of energy and electricity. Energy production and energy resources in Turkey. Energy consumption and energy market in Turkey. Renewable energy sources. Hydraulic energy. Hydroelectric plants and electricity generation. Electricity generation and transmission in HEPPs. Water intake structures and transmission lines. Penstock pipes. Powerhouse. Turbines, turbine types. Turbine selection and hydraulic calculations. HEPP downstream facilities. Shaft pitch and equipment. Economics in hydroelectric facilities. Relationship between generation and electricity market in hydroelectric facilities.			
	1204550-1214550	**Railway Engineering (TEC 1)**	**5**	**3**
Objective	To learn about railways and their strategic importance. Getting to know the railway construction elements. To have knowledge about physical and geometric designs.			
Content	Introduction to Railway Engineering. Wheel and Rail Contact Mechanism. Rails. Traverses and Fasteners. Ballast. Ballast Maintenance and Repair. Road Structure Design. Geometric Design of the Road. Scissors Crossover and Special Structures.			

	1204551-1214551	**Flood Hydrology (TEC 1)**	**5**	**3**
Objective	To teach the importance and definition of flood, flood analysis methods and risk analysis, statistical methods used in flood forecasting and their applications to various examples and to provide information on flood management issues.			
Content	Flood concept, classification of floods, factors affecting floods. Flood damages and protection methods. Precipitation-runoff relationships, runoff event and runoff forecasts. Hydrograph analysis. Flood forecasting methods and their importance. Unit hydrograph concept. Synthetic unit hydrograph methods. Statistical Flood Forecasting methods. Flood offset. Hydrological methods used in flood routing. Hydraulic methods used in flood routing. Flood control methods. Economic analysis. flood management.			
	1204531-1214531	**Scaffolding and Form Techniques (TEC 1)**	**5**	**3**
Objective	To teach the form and scaffolding technologies produced and applied in today's construction technologies and the issues that should be considered for the installation and disassembly of forms and scaffoldings. To give information about the developments in form and scaffolding technologies and the occupational health and safety.			
Content	Definition of form, basic properties. Standards and regulations. Classification of forms. Construction cost of forms. Primary elements of forms. Design principles of form members. Industrial form systems in reinforced concrete members. Definition of scaffolding systems and types. The issues considered for the installation and disassembly of scaffoldings. Recent developments in form and scaffolding technologies. A visit to a construction site.			
	1204541-1214541	**Fundamentals of Soil Dynamics (TEC 1)**	**5**	**3**
Objective	To teach the basic principles of geotechnical earthquake engineering and soil dynamics in our earthquake-affected country. To examine the behavior of soils and foundations under dynamic effects, and to provide the students with sufficient knowledge and analysis skill in the design of soil structures by considering the dynamic effects.			
Content	Introduction to Soil Dynamics. Fundamentals of vibration in soil dynamics. Waves in elastic medium. Properties of dynamically loaded soils. The vibration of the foundations. Dynamic bearing capacity of shallow foundations. Earthquake and ground shaking. Lateral earthquake pressure in retaining walls. Compressibility of soils under dynamic loads. Liquefaction of Soils. Machine foundations on piles. Seismic stability of earthfill dams.			
	1204546-1214546	**Summer Practice 1**	**4-5**	**3**
Objective	To develop the practical knowledge by using the basic concepts and principles in application which were learnt during the civil engineering education.			
Content	Taking information about the construction site. Fulfilling the duties given in the construction site. The evaluation of knowledge learnt about the construction site. The evaluation of questions and opinions about the construction site. Preparation of the summer practice report performed in the construction site. Submission and presentation of the summer practice report to the department.			
	1204550-1214550	**Cement and Concrete Technology (TEC 1)**	**5**	**3**
Objective	The aim of this course is to provide students with basic information about cement and concrete production and to introduce the applications of cement and concrete technology in the field of civil engineering.			
Content	Cement, aggregates, mixing water, concrete additives, properties of fresh concrete, calculation of mixture ratios of concrete materials, production and transportation of fresh concrete, curing of concrete, concrete strength, tensile and bending properties of concrete, stress-unit deformation relationship, poisson ratio, modulus of elasticity , concrete time-dependent deformations, durability of hardened concrete, current problems in concrete technology.			

3rd CLASS 6th SEMESTER

	1204602-1214602	**Reinforced Concrete 2**	**6**	**5**
Objective	To teach the solution of other reinforced concrete problems in addition to the "Reinforced Concrete I" course knowledge.			
Content	Punching shear. Short cantilever. Torsion in reinforced concrete elements. Elements in compound bending. Delicacy. Oblique bending. Floors. Stairs. Foundations.			
	1204603-1214603	**Steel Structures 2**	**6**	**4**
Objective	To teach the formation and calculation methods of compression members, beams, columns and truss elements in steel structures, to teach the supporting of beams in steel structures and the dimensioning of steel structure connections, the design and dimensioning of beam-beam and beam-column connections and the design of column base connections, anchors and column connections of steel structure frames.			
Content	Members under the effect of axial compression force – Built-up compression members. Example solutions for built-up compression members. Members under the effect of bending moment-Beams. Example solutions for beams-bending moment effect. Members under the shear force and example solutions. Built-up beams and example solutions. Bolted beam splice connections and example solutions. Welded beam splice connections and example solutions. Supporting of beams. Connections of beams, hinged connection. Example solutions for hinged connections of beams. Continuous beam connections and example solutions. Column base and foundation.			
	1204606-1214606	**Foundation Engineering**	**6**	**5**
Objective	To teach the determination of the bearing capacity of soils with different theories and field experiments, the design of shallow and deep foundation systems and soil improvement methods.			
Content	Introduction; Foundation engineering, Course objectives, Classification of foundations. Soil Investigations; Soil investigation methods, Inspection pits, Drilling, Standard penetration test, Cone penetration test, Geophysical methods, Soil inspection report. Bearing Strength of Soils; Fracture in the foundation ground, Theories of bearing capacity. Bearing Strength of Soils; Field tests, Bearing capacity Tables, Example problems. Singular Fundamentals; Classification, Rigid acceptance method, Centrally loaded foundations, Eccentrically loaded foundations, Symmetrical and asymmetrical foundations, Sectional influence diagrams. Singular Fundamentals; Bearing force verification, Slip verification, Stapling verification, Bending verification, Example problems. Continuous Fundamentals; Classification, Underwall continuous foundations, Subcolumn continuous foundations, Rigid acceptance, flexible acceptance. Continuous Fundamentals; Cross-sectional influence diagrams, investigations, Compound foundations, Example problems. Raft Foundations; Flat rafts, Beamed rafts, Celled rafts, Calculation methods, Example Problems. Pile Foundations; Piles, End piles, Friction piles, Pile driving schemes, Piles bearing capacity, Static pile formulas. Pile Foundations; Dynamic Pile Formulas, Field experiments, Pile groups, Negative environmental friction, Example Problems. Foundation Settlements; Sudden settlement in cohesionless soil, Consolidation settlement in cohesive soil, Analysis of foundations. Stabilization of Soils; Surface Stabilization, Deep Stabilization. Keeping the Foundation Pit Dry and Cofferdams, Geosynthetics, Anchors, Diaphragm Walls, Collapsible and Swelling Soils.			
	1204624-1214624	**Transportation**	**6**	**5**
Objective	To teach basic geometrical arrangements for appropriate route design that will ensure vehicle and human safety in transportation planning.			
Content	Introduction; road-country-environment relationship. Transport and transport systems. Various capacity definitions, service level concept, conditions affecting capacity. Project rate, project traffic, annual average daily traffic (AADT), maximum hourly traffic (30 Hours). Determination of geometric standards, classification and standards of roads in Turkey, crossing (route) research, zero line (polygon). Types and characteristics of horizontal curves, vehicle stability on curves, overturn, overturn applications, transverse acceleration and deceleration. Transition curves, curved curve design and superelevation applications. Visibility on horizontal curves, visibility on roads, boy-section, crossing the red line. Vertical curve applications, cross sections, cross section calculations, volume calculations. Brukner diagram and transport. Drainage methods, underground and surface drainage facilities, general evaluation, repetition and application examples.			

	1204634-1214634	**Principles of Earthquake Engineering**	**6**	**5**
Objective	To teach earthquake, behavior of structures and building elements under the influence of earthquakes, teaching principles of earthquake resistant building design			
Content	Earthquake motion, occurrence and characteristics of earthquake, intensity and magnitude of earthquake. Faults and tectonic zones, faults and tectonic zones on earth and in our country, active seismotectonics of Turkey. Single degree of freedom systems, force displacement relationship, linear elastic systems, inelastic systems. Damping force, equation of motion (effect of external forces), equation of motion (effect of earthquake), element forces. Free vibration, undamped free vibration, viscous damped free vibration, free vibration tests. Earthquake spectra, the effect of soil condition on earthquake motion, soil liquefaction, soil structure interaction. Turkey's earthquake zones map and design spectrum. Calculation rules for earthquake resistant buildings (General principles and rules, irregular buildings). Calculation rules for earthquake resistant buildings (Equivalent earthquake load method). Calculation rules for earthquake resistant buildings (spectral acceleration coefficient, spectrum coefficient, earthquake load reduction coefficient, examples). Reinforced Concrete Curtains, with tie beams (gap curtains). Approximate solution-Muto Method under earthquake loads, Mode combining method.			
	Social Responsibility Elective Course 2 (Non-Technical Elective Course 2)			
	1204625-1214625	**Risk and Risk Management (SEC 2)**	**6**	**3**
Objective	To teach the possible risks encountered in business life and to provide the ability to manage them.			
Content	Risk and risk management concept. Occupational health and safety management systems. Risk Evaluation Regulation. Hazard-risk and other definitions. Risk evaluation methods, risk matrix, control lists. Risk management process. Occupational illness risk management process. Risk evaluation guidelines. Risk evaluation application.			
	1204640-1214640	**Traffic Engineering (SEC 2)**	**6**	**3**
Objective	To give information about analysis of traffic flows, statistical properties, determination of problems in various types of intersections, development of solution options, signalized intersection planning and signalization calculations.			
Content	Basic structure of transportation systems. The main function of the road. Driver, pedestrian and vehicle characteristics in terms of traffic. Resistances to movement, stance-sight lengths, transitional sight lengths. Distribution of vehicle arrivals, vehicle tracking interval, lecture and applications. Change in traffic, increase in traffic. Traffic volume, density, speed relations. Capacity of roads, service level concept. Factors affecting capacity, intersections, conflict points, roundabouts, multi-storey intersections, their types, characteristics and planning principles. Design of traffic islands and canalized intersections. Signalized intersections and constant time signal calculation. Vehicle-excited signals and coordinated signaling systems. Intelligent transportation and intelligent transportation systems.			
	1204636-1214636	**Entrepreneurship (SEC 2)**	**6**	**3**
Objective	The aim of the entrepreneurship course is to spread entrepreneurship education, to motivate entrepreneur candidates who want to start their own business and to inform them about the concept of business plan, which is necessary to establish a successful business. Also, to examine successful and unsuccessful entrepreneurship stories and to draw a cause and effect relationship from these stories.			
Content	Basic concepts in entrepreneurship. Entrepreneur sees opportunities and creates ideas. Feasibility analysis. Entrepreneurship in the construction industry. Characteristics of entrepreneurs. The advantages and disadvantages of doing your own business. Advantages and disadvantages of paid work. Entrepreneurship trends in the construction industry. What is an entrepreneurial culture? Differences between entrepreneur and manager. Gender factor in entrepreneurship. Local entrepreneurship. Concession franchise. Entrepreneurial ethics and ethical values. Entrepreneurship stories.			

	1204638-1214638	**Scientific Research and Presentation Techniques (SEC 2)**	**6**	**3**
Objective	To provide the students of civil engineering department to have knowledge about fulfilling a scientific research and presenting the results of that research.			
Content	Scientific research definition, importance. Scientific research methods and processes. Writing rules of scientific research report. Use of graphics and tables in research report writing. Ethical principles in research report writing. Developing oral communication skills, elements to be considered. Body language techniques. Effective use of body language while presenting. Programs used to prepare presentation files. Things to consider in preparing a presentation file, use of colors, slide design, use of time. Student presentations in front of the audience.			
	Technical Elective Course 2 (TEC 2)			
	1204627-1214627	**Soil Improvement Methods (TEC 2)**	**6**	**3**
Objective	To teach the soil improvement techniques depending on the usage purpose of the soil.			
Content	Soil improvement techniques. Soil compaction. Stabilization with lime and cement. Deep compaction. Vibro-flotation. Injection. Jet grout. Stone columns. Pre-loading. Pile foundations. Geosynthetics. Reinforced soils. Application examples. Geophysical Methods.			
	1204629-1214629	**Principles of Structural Dynamics (TEC 2)**	**6**	**3**
Objective	To teach the fundamental concepts of structural dynamics required for earthquake engineering.			
Content	Characteristic of single degree of freedom systems. The equation of motion. Solution methods of the equation of motion, Static condensation. Free vibration of damped and undamped single degree of freedom systems. Examples of Free Vibration. Undamped vibration under harmonic forces. Damped vibration under harmonic forces. Vibration under general forces. Numerical solution of dynamic responses. Response Spectrum Concept. Equation of motion (Multi Degrees of Freedom Systems, dynamic forces, static condensation). Free vibration analysis (Natural vibration modes and frequencies, orthogonality and normalization of modes, modal expansion, free vibration of multi-degree-of-freedom systems, eigenvalue problem, vector iteration methods). Dynamic analysis of linear multi-degree-of-freedom systems (Modal analysis of damped and undamped multi-degree-of-freedom systems, modal forces, modal participation factor, response spectrum analysis).			
	1204630-1214630	**Coastal and Harbor Engineering (TEC 2)**	**6**	**3**
Objective	To teach the necessary theoretical information about coastal and harbor engineering branch and the basic principles to apply this theoretical information into practical.			
Content	Introduction to coastal and harbor engineering, maritime and the scope of maritime, weather-sea-land relationships, basic concepts, sea waves, classification of waves, changes in waves at coastal regions, currents, shore protection structures, bank revetments, shore stability structures, coastal flows, coastal sediment transport, breakwaters, harbors, classification of harbors, harbor structures, docks, piers, coastal changes due to shoreline structures.			
	1204632-1214632	**Urban Transportation (TEC 2)**	**6**	**3**
Objective	To give information about urban transportation and transportation systems at undergraduate level			
Content	Introduction and basic concepts. Typical urban transportation modes. General structure of transportation planning process. Development process of cities. Arrangement of main road networks. Classification of urban roads. Urban transportation policies. The effect of road improvement on vehicle traffic. Integration of rail transport system. Public transport model in urban transportation. Capacity of urban roads. Characteristics of vehicle types. Stages in urban transportation planning. Survey phase. Request phase. Travel distribution phase. Route selection stage. Intersections, general introduction. Purpose of arrangement. Peer-level intersections, roundabouts, different multilevel intersections, Istanbul transportation master plan, Konya transportation master plan. Intelligent transportation.			

	1204650-1214650	**Hydroclimatology (TEC 2)**	**6**	**3**
Objective	To provide students with more detailed information on hydrology at the undergraduate level. In addition, to provide detailed information about the regional and global effects of climatic effects in water resources engineering.			
Content	Introduction to hydroclimatology, the components of water cycle, formation of precipitation, types and effects, effects of hydroclimatological variables on water resources and structures, global and regional climate dynamics, drought phenomenon in terms of hydroclimatology, flood phenomenon in terms of hydroclimatology, hydroclimate spatial changes, hydroclimate temporal changes, hydroclimatological features of our country and our region, analysis of hydroclimatological effects from the social, cultural and economic aspects, the place and importance of hydroclimatology for decision makers, hydroclimatological prospects for the future, case studies.			
	1204626-1214626	**Matrix Methods in Structural Analysis (TEC 2)**	**6**	**3**
Objective	To teach the matrix methods in structural analysis calculations and to make finite elements based analyses by the aid of computer programs.			
Content	Matrix calculation and basic mathematics. The subjects of elastic curve and slope-deflection method. Determination of stiffness matrix. Determination of force matrix. Calculation of displacements matrix and determination of bar end forces. Calculation of inclined members. Single loading conditions under distributed loads and bars. Isoparametric members. Plates and shells. Three dimensional systems.			
	1204633-1214633	**Reinforced Concrete Load-Bearing Systems (TEC 2)**	**6**	**3**
Objective	Teaching the Analysis and Modeling of Reinforced Concrete Structural Elements.			
Content	Stress-Strain Relationships for Concrete and Reinforcing Steel. Wrapped and Unwrapped Concrete Strength. Reinforced Concrete Structural Elements analysis. Modeling of Reinforced Concrete Structural Elements. Design of Reinforced Concrete Bearing Elements. Moment Curvature Relationship in Reinforced Concrete Elements. Reinforced Concrete Shear Walls. Shear Walls with Bond Beams. Design Principles According to Shapeshifting.			
	1204628-1214628	**Principles of Prestressed Concrete (TEC 2)**	**6**	**3**
Objective	To teach the calculation and construction principles of prestressed concrete structures.			
Content	Material. Brief information about prestressed concrete. Classes of prestressed concrete. Calculation of concrete stresses in cracked condition. Calculation of steel stresses in cracked condition. Cross-section control. Dimensioning in cracked condition. Shrinking effects. Creep effects. Cross-section calculation for simple beams. Composite beams and calculation principles of composite beams. Loading stages. Stress losses. Constructive principles.			

4th CLASS 7th SEMESTER

	1204701-1214701	**Reinforced Concrete Building Design Applications**	**7**	**5**
Objective	To provide the students to get information about the reinforced concrete building design.			
Content	Distribution of the project data about the project, and the description of the project. Reinforced concrete (RC) slab calculations and drawings. Calculations of RC stairs and drawings. Beam and column presizing and slope-deflection method. Earthquake load analysis and distribution of lateral force to the members using Muto Method. Creating 2D and 3D models of the structure by using SAP2000/ETABs. RC beam calculations. RC column calculations. RC shear wall calculations. Foundation calculations. The evaluation of the project. Preparing the all calculations and drawings by using AUTOCAD. Submission of the project.			
	1204702-1214702	**Water Supply and Wastewater Removal**	**7**	**4**
Objective	To teach the applications and design principles about population and water demand calculation methods, planning of water resources, transmission lines, reservoirs, water distribution networks and wastewater collection systems.			
Content	Water and environmental health, water resources planning, members of water and environmental health facilities. Population estimates, water demand calculation methods, project period, unit water consumption, population density. Water resources, types of water resources, properties of waters (physical, chemical, bacteriological, radioactive). Abstraction of water, collection of spring water, types of spring waters, catchment of spring waters. Groundwater hydraulics, groundwater water catchment structures, discharge calculations of infiltration galleries, calculation of well discharges, well efficiency curves and critical values. Groundwaters on seawaters, fresh water-salty water relations, abstraction of groundwater by galleries. Wells, types of wells, free surface wells, pressured wells, construction of wells, well equipment. Surface water catchment, lake catchment, river catchment, pollution of water resources. Water transmission line types, free surface transmission lines, water transmission with open channels. Water transmission by gravity, calculation of pipe diameters, discharge calculation for gravitational water transmission line, equipment of water transmission line. Water transmission by pumping, location selection of pumping station, number of pumps, pump selection and pipeline characteristics. Water reservoirs, types of reservoirs, properties of the reservoir locations, water depths, determination of reservoir elevation, reservoir volumes, equipment of reservoirs. Water distribution networks, water network types and construction, network elements, calculation of network pipes. Environmental health facilities, street slopes, calculation of wastewater channels.			
	1204740-1214740	**Construction Management**	**7**	**3**
Objective	To teach the technical and legal management of a construction from planning to completion.			
Content	Construction projects and relations, construction stages, building elements and construction techniques, public procurement law, project planning, zoning law, quantity applications.			

	1204705-1214705	**Computer Applications in Structural Engineering**	**7**	**3**
Objective	To teach how to do static and dynamic analysis of structures with ETABS software.			
Content	General introduction of ETABS Program, use of menus and toolbars. Analysis of two-dimensional reinforced concrete structure. Analysis of a reinforced concrete structure. Modal Analysis. Analysis in Time-History. Dimensioning of Reinforced Concrete Structure. Steel Structure Analysis. Modeling of Steel Industry Structure. Analysis of a Structure with Insulators Nonlinear Static Analysis.			
	1204706-1214706	**Water Resources**	**7**	**4**
Objective	To teach the students the principles of the development of water resources and to provide knowledge about the sizing and operation of the engineering structures to be built for this purpose.			
Content	Development of water resources. The importance and stages of the development of water resources, Turkey's water resources and water budget. Stream and its morphology. Stream and basin characteristics. Solid matter in streams. Stream Applications Stream structures, relief structures. Regulators. Types of regulators and auxiliary structures. Regulator sizing and verifications. Regulator Applications. accumulation structures. dams. Dam reservoirs. Water intake structures. Energy breaking pools. Dam applications			
	1204725-1214725	**Highway Engineering**	**7**	**3**
Objective	To teach the basic information required in highway construction.			
Content	Definitions about highways. Superstructure and substructure applications of highways. Experiments on granular materials. CBR (California Bearing Ratio) Test. Highway foundation applications. Flexible superstructure design. Materials used for the flexible road pavement. Tests applied on the materials used for flexible road pavement. Bituminous binders, general characteristics. Bituminous hot mixtures, design of bituminous hot mixtures and applied tests. Rigid superstructure, design and used materials. Joints, comparison of flexible and rigid superstructures.			
	Technical Elective Design Applications 1 (STTU 1)			
	1204712-1214712	**Steel Structure Design Applications (STTU1)**	**7**	**5**
Objective	To teach the calculations, dimensioning and detailing of steel truss and purlin systems in order to cover the top of a single-storey and single-span structure and the behavior, calculation methods, theoretical and practical assumptions of steel structures and steel in accordance with the current regulation principles (ÇYTHYE-2016), both theoretically and practically and to give the engineering responsibility related to this subject to the student.			
Content	Project data distribution. Plan drawing (Scale:1/100), Finding truss beam spacing, Determining bar lengths, Choosing roof covering. Purlin beam calculation. Tensionless solution. Purlin calculation, tensioned solution from L/2, tensioned solution from L/3, tension rod calculation, economic comparison table. Finding the bar forces, Finding the forces on the nodes, Solution with the nodal points method. Finding the bar forces with the SAP2000/ETABS program. Creation of bar force Table, 1. Self load, 2. Full snow load, 3. 1/2 snow load, 4. Right wind load, 5. Left wind load. Determination of the bar sections. Calculation of joints according to the applied joining tools (weld or bolt). Steel column and foundation calculations and quantity production. Completion of calculations and production of quantity. Making the drawings of the project in the AutoCAD program; 1. Roof plan (Scale: 1/50), 2. 1/2 Structural System (Scale: 1/10) 3. All Node details (Scale: 1/2) 4. Wind and stiffness connection details (Scale: 1/ 2) 5. Drawbar attachment detail (Scale: 1/2)			

	1204715-1214715	**Foundation Design Applications (STTU 1)**	**7**	**5**
Objective	To detail the information taught in Soil Mechanics and Foundation Engineering courses by the aid of an application project.			
Content	Distributing the project data and giving general information about the project for the preparation of the foundation projects for the residential and social facility buildings to be designed in a sample construction site with the ground properties and site plan. Determination of soil properties, soil classes, soil profile and total stress, pore water pressure and effective stress values of the soil. Determination of bearing capacity of soils with different theories. Singular foundation design. Combined foundation and continuous foundation designs. Drawing shear force and moment diagrams, reinforcement for foundation types, drawing details. Raft foundation design. Calculation of the vertical stress increases in the soil at different depths according to the foundation systems. Determination of the consolidation and total settlement values under different foundation types and the details of the consolidation-time relationship. Pile foundation design under residential building. Drawing the details of the pile foundation. Retaining wall design for a sloping surface around the construction site. Reinforcement of the retaining wall.			
	1204718-1214718	**Laboratory Applications in Civil Engineering (STTU 1)**	**7**	**5**
Objective	To provide students with knowledge about the experimental techniques used in civil engineering, to develop their ability to obtain test results, interpret-discuss and report by applying specific test methods belonging to different sub-branches.			
Content	General Information on Experimental Methods Used in Civil Engineering and Their Importance. An overview of the experimental methods applied in the Geotechnical Department. An overview of the experimental methods applied in the Department of Building Materials. An overview of experimental methods applied in Transportation Science. Application of softening point and penetration tests to bituminous binder with students. Experimental and analytical investigation to determine what proportions of aggregates of known gradation will be used to achieve the targeted gradation. Preparation of briquettes to be used in Marshall test together with students. Determination of the measurement and loading results applied to Marshall briquettes to be used in determining the optimum bitumen content of the mixture. Conducting the steel pull experiment and the Los Angeles experiment with students. Realization of concrete compression and bending experiment with students. Experimental determination of the grain distribution of soils (sieve analysis and hydrometer test), soil particle specific gravity (by pycnometer test) and water content 2) Experimental determination of soil consistency limits, liquid limit (Casagrande method and falling cone method), plastic limit and shrinkage limit determination. Shear strength parameters of the soil; Experimental determination of unconfined compressive strength by shear box and vane methods. Experimental determination of consistency limits of soils, liquid limit (Casagrande method and falling cone method), plastic limit and shrinkage limit. Compaction test with standard Proctor test for stabilized soils and consolidation test for cohesive soils.			
	1204717-1214717	**Structural Analysis Applications (STTU 1)**	**7**	**5**
Objective	To apply the information taught in Structural Analysis I and Structural Analysis II courses on a practical higher order hyperstatic frame.			
Content	Distribution of project data. Selecting 5 different basic isostatic systems for the Force Method solution of the given load-bearing system and choosing one of them. Drawing the unit loading diagrams of the chosen basic isostatic system. Obtaining the products of the unit loading diagrams of the chosen basic isostatic system by using the product table. Drawing the M, V and N diagrams for vertical loads and controlling with the closed continuity equations. Drawing the M, V and N diagrams for horizontal loads and controlling with the closed continuity equations. Determination of the displacements of the desired points and nodes in case of vertical and horizontal loads acting together. Drawing the M, V and N diagrams in case of uniform temperature change. Drawing the M, V and N diagrams for the given support failures. Summarization of the process steps of Matrix Displacement Method (MDM). Drawing the M, V and N diagrams using MDM for the vertical loads. Drawing the M, V and N diagrams after solving the system for the vertical loads and horizontal loads separately by using SAP2000 program. Comparison of the results of these three methods. Submission and presentation of the project.			

	1204736-1214736	**Summer Practice 2**	**6-7**	**3**
Objective	To develop practical knowledge by using the basic concepts and principles learned during civil engineering education in practice.			
Content	Recognizing the office environment. Taking information about the existing work in the engineering office. Fulfilling the given works successfully. Preparation of the summer practice report performed in the engineering office. Submission and presentation of the summer practice report to the department.			

4th CLASS 8th SEMESTER

	1204716-1214716 1204801-1214801	**Elective Civil Engineering Main Design Applications (SIMATU)**	**7-8**	**12**
Objective	To teach the sizing and detailing of a selected sample structure according to all kinds of effects and to gain the ability to investigate.			
Content	Determination of the research subjects. Reference research, the evaluation of the obtained references related to the subject. To make the outlines of the study clear. Discussion of the findings, determining additional sub titles, if necessary. Reference research and studies about the subtitles. Evaluating, writing and converting the findings into a report. Examining, writing and presenting the results.			
	1204804-1214804	**Labor Law**	**8**	**2**
Objective	To teach the legal relationship between the employee and the employer and the role of the state in this relationship in details.			
Content	Concept of labor law, definition, divisions. Formation, development and basic characteristics of labor law. Place of labor law in legal system. General and special references of labor law. Employee, employer, primary employer, sub-employer and employer representative concepts. Definition and scope of workplace. Opening, transfer and closure of a workplace. Definition, elements, features and transfer of labor contract. Debt of employer. Debt of employee. Wage of the employee. Working periods, overtime work, night work, make-up work, short-time work, rest periods, rest breaks, weekend break, general holiday and paid annual leave. Obligations of the employer, the state and the employee in terms of occupational health and safety.			
	1204814-1214814	**Professional Ethics**	**8**	**2**
Objective	To understand the importance of the universal dimension of ethics, to teach the professional responsibility and ethical principles of engineering ethics and civil engineering and to gain the ability to examine, question and evaluate the professional dilemmas.			
Content	Definition of “ethics”. Definition of morality. Ethics-morality relationship. Historical ethics. Hierarchy of values. The relationship of ethics with other sciences and their foundations. Professional ethics.			
	1204826-1214826	**Construction Site Technique**	**8**	**3**
Objective	To provide the necessary managerial skills in construction works to the civil engineering candidates and to teach them to organize their formal and informal relationships.			
Content	Preparation for the structure, definitions and explanations of labor law regarding the contractor and the employer. Tender Law No. 4734 and Tender Regulation. Zoning Law No. 3194 and Zoning Implementation Regulation. Technical Trip to important construction sites Construction Site Organization Construction Site and Construction Site Organizations, formwork and work scaffolding. Technical Trip to Important Construction Sites Structure of Construction Firms Water Structures Construction Sites Highway, Railway, Port Construction Sites General organization of Construction Site Structures Occupational health and safety.			
	1204825-1214825	**Engineering Economy**	**8**	**3**
Objective	To teach the economic analysis applications necessary for the civil engineers, to teach the adequacy and limits of cash flow analyses for the evaluation of the investments and to provide the ability of formulating cash flow models in practice.			
Content	Introduction to engineering economy. Supply-Demand relationship. Supply elasticity. Demand elasticity. Par value point analyses. Simple interest. Compound interest. Money and time relationships. Profitable project selection methods. Renovation investments. Economic life analysis. Depreciation calculations.			

	Technical Elective Design Applications 2 (STTU 2)			
	1204811-1214811	**Highway Design Applications (STTU2)**	**8**	**5**
Objective	To design a highway between two points given on the topographic map, to develop the engineering perspective of the student in order to solve the problems that may occur in the design.			
Content	Determination of road geometric standards. Determination of the zero line, which will make the earthworks along the road to a minimum. Examination of alternative road routes on the determined zero line. Exact axis calculation of the selected route. Preparation of the length profile of the selected route. Determination of cross-section locations and kilometers. Dev account. Adding a transition curve to the route, calculating the transfer curve with a transition curve. Red line research. Vertical curve design. Calculation of area values of cross-sections (Slitting and filling). Areas diagram and volume calculations. Soil distribution and calculation of transport distances. Flexible pavement design. Delivery and evaluation of reports and sheets of the project.			
	1204812-1214812	**Water Supply and Wastewater Systems Design Applications (STTU 2)**	**8**	**5**
Objective	To prepare a water supply project determining water from different water resources for a residential area in integrity in accordance with the relevant laws and regulations.			
Content	Distribution of project data, giving information about the project. Gathering information (culture, economy, water resources, demography, geological features and maps etc.) about the residential area. Making population projections, determining water needs, relevant diagrams. Taking water from the slope upstream, relevant calculations and drawings. Taking water from horizontal and inclined layer springs, relevant calculations and drawings. Taking water from free surface wells, relevant calculations and drawings. Taking water from pressurized wells, relevant calculations and drawings. Design of a gravitational water transmission systems, drawing the cross-section and hydraulic profile. Economic design of a pressurized water transmission line. Determining the volume of air tanks, drawing the crosssection and hydraulic profile. Design of water reservoirs and related drawings.			
	1204813-1214813	**Water Structures Design Applications (STTU 2)**	**8**	**5**
Objective	To evaluate the measurements and calculations necessary for the planning, design and projecting of a mooring facility in a river determined as a water source for the students of the Civil Engineering Department.			
Content	Distribution of data and giving information about the application. Gathering information for the hydrological report of the region. Preparation and presentation of the hydrological report. Evaluation of the hydrological data. Rating curve and reservoir calculation. Sizing of sedimentation pool and washing channel. Sizing of the transmission channel. Determination and sizing of measurement structure. Sizing of transition channels. Sizing the spillway body. Required investigations. Making necessary investigations. Preparation of report and file. Delivery and presentation of the report.			
	Technical Elective Course 3 (TEC 3)			
	1204840-1214840	**Repair and Strengthening in Buildings (TEC 3)**	**8**	**3**
Objective	To give basic information about the repair and strengthening processes of the buildings in order to be reused after getting damaged due to construction deficiencies, faults and earthquakes and to explain sample applications related to the subject.			
Content	Damage identification, assessment and classification. Forms cracks and damage in reinforced concrete structures. Determination of building safety. Structural reinforcement approaches. Element reinforcement details. Methods of evaluating the behavior of reinforced concrete structures. Strengthening problems in reinforced concrete structures. Reinforcement of reinforced concrete columns. Reinforcement of reinforced concrete beams. Reinforcement of reinforced concrete curtains. Repair and strengthening of existing buildings according to TBDY-18. Determination of Earthquake Performance of Existing Buildings. General Principles and Rules Regarding Earthquake Calculation.			

	1204841-1214841	**Prefabricated Structures (TEC 3)**	**8**	**3**
Objective	To teach the calculation and construction principles of prefabricated structures.			
Content	The meaning and purpose of prefabricated construction. General definitions, materials and loads. Design Principles, Prefabricated building elements. Join types and calculation principles. Introducing TBDY-2018, TS9967 and TS3233. Technical tour. Manufacturing, transportation and assembly principles. Experimental studies on prefabricated buildings. Stocking and tolerances. Modeling in FAB-2018 and SAP2000 programs.			
	1204843-1214843	**Deep Foundations and Deep Excavations (TEC 3)**	**8**	**3**
Objective	To teach the application of deep foundations in cases when shallow foundations are insufficient and the applied methods to provide the stability in case of deep excavation.			
Content	Description and Functions of Deep Foundations and Piles. Static Pile Capacity Calculation Methods for Single Piles. Negative Environmental Friction, Driven Piles and Dynamic Pile Formulas. Determination of pile capacity from field tests. Group behavior of piles and pile loading experiments. Settling behavior in pile groups and Pile raft foundation systems. Determination of lateral load carrying capacity of piles. Mini and Micro piles, obliquely loaded piles. Well foundation, Foot foundation and caisson foundations. Definition of Lateral Ground Pressures. Analysis of bearing structures and design methods. Design of sheet pile curtains. Investigation of console pile and anchored bored pile designs. Construction and control of shoring systems.			
	1204851-1214851	**Hydraulic Models and Measurements (TEC 3)**	**8**	**3**
Objective	By giving the concepts of dimension and unit, the basic principle of dimensional homogeneity and how this principle is applied to nondimensionalize equations will be mentioned. The concept of similarity between Model and Prototype will be explained.			
Content	Dimensions and units. Dimensional homogeneity. Nondimensionalization of equations. Dimensional analysis and similarity. Recurrent variables method and Buckingham Pi theorem. Froude Affinity. Reynolds Affinity.			
	1204852-1214852	**River Regulation (TEC 3)**	**8**	**3**
Objective	To inform the students about the structures to be constructed within the planning and their sizing in order to be protected from river's damages.			
Content	Stream definitions. Stream classification. Stream network and basin. Streams and basins of Turkey. Coastal legislation and rivers subject to this legislation. Technical characteristics and morphology of rivers. Destabilizing factors and solid matter movement in streams. Stream regulation. Planning. Stream Applications. Stream regulation structures. Base protection structures. Coastal protection structures. spurs. parallel structures. Embankment dams.			
	1204850-1214850	**ANSYS Applications in Civil Engineering (TEC 3)**	**8**	**3**
Objective	To teach the modeling of building elements with ANSYS software, design and evaluation of results.			
Content	System modeling techniques. Linear and nonlinear material behavior. Two and three dimensional element types and behaviors. Static and dynamic loading conditions. Identification of boundary conditions. Static, dynamic, linear and nonlinear analyses. Evaluation of results. Application studies.			

	1204844-1214844	**Computer Applications in Geotechnical Engineering (TEC 3)**	**8**	**3**
Objective	To make the computer aided analyses and designs of geotechnical engineering applications and to calculate the necessary parameters to carry out these analyses and to make inferences. To teach the methods and principles required for the selection and design of geotechnical engineering methods by using software programs.			
Content	Laboratory Experiments in Geotechnical Engineering. Field Experiments in Geotechnical Engineering. Strength parameters of soils in Geotechnical Engineering. Correlation between parameters in Geotechnical Engineering. Material models in Geotechnical Engineering. Finite element method in Geotechnical Engineering. Stability of slopes. Retaining walls. Deep digs.			
	1204853-1214853	**Artificial Intelligence and Civil Engineering Applications (TEC 3)**	**8**	**3**
Objective	To discuss the basic concepts and method approaches of artificial intelligence applications in civil engineering.			
Content	Introduction to artificial intelligence. Introduction of the basic concepts of Artificial Intelligence. Applications of Artificial Intelligence around the world. Artificial intelligence engineering applications. Artificial intelligence civil engineering applications. expert systems. Expert systems and civil engineering applications. Python programming language introduction. Machine learning applications in civil engineering (with Python). Deep learning applications in civil engineering (with Python).			
	1204806-1214806	**Construction Management and Construction Site Techniques**	**8**	**3**
Objective	To provide civil engineer candidates with managerial skills that will be required in construction works, formal and informal to enable them to learn to organize their relationships.			
Content	Preparation for building, definitions and explanations of labor law about contractor and employer. Tender Law No. 4734 and tender regulations. Zoning Law No. 3194 and Zoning Implementation Regulation. Technical trips to important construction sites. Discovery, merit file preparation techniques, quantity applications. Construction site and construction site organizations, formwork and scaffolding. Construction machinery. Construction site structures. Occupational health and safety.			
	1204855	**Groundwater Engineering (TEC 3)**	**8**	**3**
Objective	To give information about the formation, distribution, underground movement of water on earth, its properties and the change of space-time characteristics of the quantity and quality of the waters, the relationship with the environment and water resources engineering.			
Content	The importance of groundwater and groundwater flow; Characteristics of aquifer and basic equation; Well hydraulics; The management of groundwater; The intrusion of salt water; Drainage; Dewatering.			
	1204854	**Durability in Concrete (TEC 3)**	**8**	**3**
Objective	The aim of this course is to introduce students to the physical and chemical degrading effects that the concrete material may encounter during its service life and to convey the precautions to be taken accordingly.			
Content	Definition of durability in concrete, disruptive effects in concrete, water as a disrupting element, permeability, permeability of hardened cement paste, permeability of aggregate, permeability of concrete, freezing-thawing, freezing of hardened cement paste, de-icing salts, fire effect, cement paste at high temperatures, aggregate, concrete. Sulphate attack, control of sulfate attack, alkali-aggregate reaction, expansion mechanism, corrosion, corrosion control, concrete in marine structures.			

Prof. Dr. Murat OLGUN
Head of Civil Engineering Department