PROGRAM INFORMATION

Program Name and Degree Awarded

CIVIL ENGINEERING, Bachelor of Science

Duration of Studies

4 years

Total Credits / ECTS

147 / 240

Language of Instruction

ENGLISH

Mission and Vision

Mission

Our mission is to train highly qualified Civil Engineers who are needed by the public and private sectors, who are in line with the requirements of the age, who have the ability to learn and research independently, and who can produce creative solutions.

Vision

Our mission is to be a department that educates Civil Engineers who can use science and technology for the benefit of our country and humanity, who can adapt to changing world standards and innovations, who can think, question, research, have managerial skills and can compete in the international arena.

Program Objectives

Students who graduate from EUL's Civil Engineering Department are expected to:

EO1 : Be competitive candidates in the civil engineering field, capable of holding positions of employment in local, national and international companies; or be able to work in the public sector as a field engineer, construction site manager, supervisor, etc.; or be capable of establishing their own company for the purposes of offering, e.g., consultancy, auditing or management services

EO2: Provide practical solutions to problems by applying their knowledge of modelling and their ability to design, develop and implement in at least one of the key areas in civil engineering:

construction, construction materials, geotechnical engineering, transportation engineering and hydraulic engineering

EO3: Adopt lifelong learning as a core principle in their working life, keep up to date with the latest developments in their field and maintain a demonstrable commitment to continued professional development

EO4: Be able to successfully undertake postgraduate research work in order to make a positive contribution to the R&D requirements of industry.

Program Learning Outcomes

The Program Outcomes for the Civil Engineering Department at the European University of Lefke are listed below. Students graduating from the program should have:

i. Adequate knowledge in mathematics, science and engineering subjects pertaining to the **civil engineering** discipline; ability to use theoretical and applied knowledge to solve complex engineering problems.

ii. Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.

iii. Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.

iv. Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively.

v. Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or **civil engineering** specific research questions.

vi. Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually.

vii. Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language; ability to write effective reports and comprehend written reports, prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions.

viii. Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.

ix. Consciousness to behave according to ethical principles and professional and ethical responsibility; knowledge on standards used in engineering practice.

x. Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development.

xi. Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.

Curriculum

1st Semester				
Course Code	**Course Name**	**(T-A-L)C**	**ECTS**	**COURSE TYPE**
CE119	INTRODUCTION TO PROFESSION	(2-0-0)0	2	Compulsory
COM111	CHEMISTRY	(3-0-0)3	4	Compulsory
COMP117	COMPUTING FOUNDATIONS	(3-1-0)4	6	Compulsory
ENG111	CHEMISTRY LAB	(2-0-0)1	2	Compulsory
ENG121	PHYSICS I LAB	(0-0-2)1	2	Compulsory
ENG131	PHYSICS I	(3-0-0)3	4	Compulsory
FLEXX1	FOREIGN LANGUAGE ELECTIVE I (ENGLISH)	(3-0-0)3	3	Elective
MATH101	CALCULUS I	(3-2-0)4	7	Compulsory
2nd Semester				
Course Code	**Course Name**	**(T-A-L)C**	**ECTS**	**COURSE TYPE**
CE112	ENGINEERING DRAWING	(3-0-2)4	6	Compulsory
COM122	PHYSICS II	(3-0-0)3	5	Compulsory
ENG122	PHYSICS II LAB	(0-0-2)1	2	Compulsory
FLEXX2	FOREIGN LANGUAGE ELECTIVE II (ENGLISH)	(3-0-0)3	3	Elective
MATH109	LINEAR ALGEBRA	(3-0-0)3	5	Compulsory
MATH110	CALCULUS II	(3-2-0)4	7	Compulsory
COM108	HISTORY	(2-0-0)2	2	Compulsory
3rd Semester				
Course Code	**Course Name**	**(T-A-L)C**	**ECTS**	**COURSE TYPE**
CE201	SURVEYING	(3-0-2)4	7	Compulsory
CE207	MATERIALS SCIENCE	(2-0-3)3	6	Compulsory
CE211	STATICS	(4-1-0)4	6	Compulsory
COM106	TURKISH	(2-0-0)2	2	Compulsory
LEUXX1	UNIVERSITY ELECTIVE I	(3-0-0)3	4	Elective
MATH201	ORDINARY DIFFERENTIAL EQUATIONS	(3-2-0)4	5	Compulsory
4th Semester				
Course Code	**Course Name**	**(T-A-L)C**	**ECTS**	**COURSE TYPE**
CE202	STRENGTH OF MATERIALS	(4-1-0)4	6	Compulsory
CE206	DYNAMICS	(4-1-0)4	5	Compulsory
CE208	MATERIALS OF CONSTRUCTION	(2-0-2)3	5	Compulsory

LEUXX2	UNIVERSITY ELECTIVE II	(3-0-0)3	4	Elective
MATH224	ENGINEERING MATHS	(3-0-0)3	5	Compulsory
MATH226	PROBABILITY AND STATISTICS	(3-0-0)3	5	Compulsory
5th Semester				
Course Code	**Course Name**	**(T-A-L)C**	**ECTS**	**COURSE TYPE**
CE300	SUMMER TRAINING I	(0-1-0)0	1	Compulsory
CE301	SOIL MECHANICS	(3-0-2)4	6	Compulsory
CE303	STRUCTURAL ANALYSIS I	(4-1-0)4	7	Compulsory
CE307	FLUID MECHANICS	(4-1-0)4	7	Compulsory
CE309	ENGINEERING ECONOMY	(3-0-0)3	5	Compulsory
XX1	TECHNICAL ELECTIVE I	(3-0-0)3	4	Elective
6th Semester				
Course Code	**Course Name**	**(T-A-L)C**	**ECTS**	**COURSE TYPE**
CE302	TRANSPORTATION AND TRAFFIC ENGINEERING	(3-2-0)4	7	Compulsory
CE304	STRUCTURAL ANALYSIS II	(4-1-0)4	7	Compulsory
CE306	FOUNDATION ENGINEERING	(3-1-0)3	6	Compulsory
CE308	HYDROMECHANICS	(3-1-0)3	6	Compulsory
CEXX1	TECHNICAL ELECTIVE II	(3-0-0)3	4	Elective
7th Semester				
Course Code	**Course Name**	**(T-A-L)C**	**ECTS**	**COURSE TYPE**
BUSN461	STRATEGIC PLANNNING AND MANAGEMENT	(3-0-0)3	5	Compulsory
CE402	SUMMER TRAINING II	(0-1-0)0	1	Compulsory
CE403	REINFORCED CONCRETE FUNDAMENTALS	(3-0-0)3	5	Compulsory
CE405	FUNDAMENTALS OF STEEL DESIGN	(3-1-0)3	5	Compulsory
CE415	CONSTRUCTION MANAGEMENT	(3-0-0)3	4	Compulsory
CE417	WATER RESOURCES ENGINEERING	(3-0-0)3	4	Compulsory
CE419	GRADUATION PROJECT I	(0-1-0)1	2	Compulsory
8th Semester				
Course Code	**Course Name**	**(T-A-L)C**	**ECTS**	**COURSE TYPE**
CE450	GRADUATION PROJECT II	(0-9-0)5	5	Compulsory
CEXX2	TECHNICAL ELECTIVE II	(3-0-0)3	4	Elective
CEXX3	TECHNICAL ELECTIVE III	(3-0-0)3	4	Elective
CEXX4	TECHNICAL ELECTIVE IV	(3-0-0)3	4	Elective
ENGG434	ENGINEERING ETHICS	(3-0-0)3	4	Compulsory

UNIVERSITY ELECTIVE LIST				
DERS KODU	**DERS ADI**	**(T-U-L)K**	**AKTS**	**DERS TÜRÜ**
CFE201	LEADERSHIP AND MANAGEMENT	(3-0-0)3	4	SEÇMELİ
CEXX2	TECHNICAL ELECTIVE II	(3-0-0)3	4	SEÇMELİ
TECHNICAL ELECTIVE LIST				
DERS KODU	**DERS ADI**	**(T-U-L)K**	**AKTS**	**DERS TÜRÜ**
CE472	ADVANCED MATERIALS OF CONSTRUCTION	(3-0-0)3	4	SEÇMELİ
CE429	ADMIXTURES FOR CONCRETE	(3-0-0)3	4	SEÇMELİ
CE442	ADVANCED REINFORCED CONCRETE DESIGN	(3-0-0)3	4	SEÇMELİ
CE465	CONSTRUCTION PROJECT SCHEDULING	(3-1-0)3	4	SEÇMELİ
CE471	ADVANCED CONCRETE TECHNOLOGY	(3-0-0)3	4	SEÇMELİ
CE426	HIGHWAY ENGINEERING	(3-0-0)3	4	SEÇMELİ
CE485	IRRIGATION AND DRAINAGE ENGINEERING	(3-0-0)3	4	SEÇMELİ
CE490	SAFE ROAD DESIGN	(3-0-0)3	4	SEÇMELİ
CE444	HIGHWAY MATERIALS	(3-0-0)3	4	SEÇMELİ

Laboratory and Equipment Capacity (if applicable)

1. 200 kN Capacity Fully Automatic Compressive Strength Testing Machine
2. 20 kN Capacity Fully Automatic Flexural Testing Machine
3. Steel Tensile Testing System
4. Low Frequency Fatigue and Creep Testing System
5. Soil Permeability Determination Testing Machine (Constant Head and Falling Head)
6. Rheometer for Fresh Concrete
7. Sound Insulation Testing System
8. Concrete Cover, Stirrup, and Rebar Diameter Determination Testing System
9. Rust Measurement Testing System
10. Three-Dimensional Concrete Tomography Testing System
11. Thermal Conductivity Testing System
12. Fully Automatic CBR-Marshall Testing System
13. Fully Automatic Pole Shear Testing System
14. Fully Automatic Three-Dimensional Compression Testing System (For CD, CU, UU Tests)
15. Soil Settlement Parameters Determination Testing System
16. UU Three-Dimensional Compression Determination Device
17. Uniaxial Compression Determination Device
18. Consolidation Test System
19. Standard and Modified Compression Test System
20. Viscometer
21. Liquid Limit Device
22. Cement Fineness Device
23. Borehole and CBR Molds
24. Curing System for Concrete and Cement Paste Samples
25. Shelby Molds for Collecting Undisturbed Soil Samples
26. Hobart Mixer
27. Porcelain Vessels
28. Plastic Limit Apparatus
29. Standard Glass Vessels of Various Volumes
30. Melting Pot for Sulfur Head

31. Bernoulli’s Theorem Demonstration
32. Impact of a Jet
33. Orifice and FreeJet Flow
34. Energy Loss in Pipes
35. Flow Channel
36. Osborne Reynolds’ Demonstration
37. Flowmeter Demonstration
38. Energy Loss in Bends
39. Free and Forced Vortices
40. Schmidt Hammer
41. Ultrasonic Testing Machine (Pundit)
42. Loading Unit
43. Caliper
44. Automatic Theodolite
45. Total Station
46. CL-2000 Chloride Field Test
47. Maturity Meter
48. Ultrasonic Testing System
49. Windsorprobe Testing System
50. GNNS (GPS) Measuring Device
51. Vicat Apparatus
52. Hand Compression Apparatus
53. Cube, Cylinder, and Beam Moulds of Various Volumes
54. Desiccator
55. Flow Table Apparatus
56. Specific Gravity Determination Test Apparatus
57. Sintering Furnace (1450 °C)
58. Standard Sieve Sets (For Coarse and Fine Aggregate Samples) and Sieve Shakers
59. Concrete Air Content Determination Apparatus
60. Vibration Table
61. Jolting Table

62. Aggregate Impact Strength Test Apparatus
63. Aggregate Crushing Test Apparatus
64. Slump Cone
65. Hydrometer Test System
66. 300 kN Capacity Fully Automatic Compressive Strength Device
67. Grinding Apparatus
68. Standard Oven
69. Los Angeles Abrasion Device
70. Compaction Factor Device
71. Vebe Device
72. Concrete Permeability Determination Test System
73. Air Compressor
74. Standard Chemicals
75. Sample Extractor
76. Le Chatlier Mould
77. Steam Tank
78. Core Drilling Device
79. Tool Box
80. Pure Water Production Device

Career Opportunities

Civil engineering program graduates have a wide range of employment opportunities. Graduates can work in public institutions and organizations, private sector construction companies, and project and consulting firms. They can also play active roles in construction site management, project design, building inspection, and infrastructure and superstructure projects. Those wishing to pursue an academic career can pursue master's and doctoral programs to advance in research and education. With developing technology, there are also opportunities to specialize in areas such as sustainable building design, smart cities, and new material technologies.

Contact Information

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COURSE CATALOGUE DESCRIPTIONS

1st Semester

CE119 Introduction to Profession

An orientation course to provide counsel to the student on the major areas of Civil Engineering, including information on the typical activity of civil engineers, integrated course sequences and content, and an introduction to the faculty. Historical, aesthetic and environmental considerations in civil engineering. Professional engineering practice and codes of ethics.

COM101 English I

This course is intended for academically oriented students and it aims to bridge the gap between general and academic English. The course aims at developing the skills required for academic study, including note-taking, essay writing, as well as teaching strategies for undertaking research and dealing with unfamiliar academic vocabulary. The course also aims at teaching the features of guided writing, reading strategies such as predicting, skimming, and scanning. At the end of this course the students are expected to be able to; develop strategies, to improve the ability to comprehend complex academic texts, to develop strategies to produce more coherent writing and, make clear, appropriate, relevant notes from academic texts, and to adopt various approaches to deal with new or unknown vocabulary by practising effective use of dictionaries, and through making effective vocabulary records.

COM111 Chemistry

The aim of this course is to describe students how substances interact with one another. Students will be informed on how the atom is made up, how atoms come together to make molecules and how molecules can interact, chemical compounds, chemical bonds, chemical equations and reactions, aqueous solutions, periodic table, gases, the electronic structure of the atom and introduction to thermochemistry.

ENG131 Physics I

This course aims to introduce the fundamental concepts of physics necessary for engineering science and to provide essential background for engineering students. The course provides deep understanding about kinematics and dynamics of one dimensional, two dimensional, circular and rotational motion. Also, the course aims to show the students the engineering applications of the course material.

COMP117 Computing Foundation

Computer terminology, units, number systems. Problem solution, algorithms, flowcharts, data types, control structures. History of computers and programming. C language basics, data types in C, identifiers, declarations, variables, expressions, assignments. Input/output functions, math library. Operators; relational, equality, and logical, precedence and associativity. Statements, flow of control, sequential structure, selective structures; if-else statements, repetitive structures; while loop, do-while loop, break statement.

ENG111 Chemistry Lab

This course contains laboratory applications related with Chemistry course (COM111). Experiments especially related with separation, stoichiometry, reactions in aqueous solutions, solution preparation and acids/bases are conducted.

ENG121 Physics I Lab

This course is directed with ENG131-Physics I. The aim of course is providing a medium for students to see the experimental applications of kinematics and dynamics of one dimensional, two dimensional, circular and rotational motion. The course supports students to validate the underlying theory through experiment and observation.

MATH101 Calculus I

Fundamentals of calculus and its applications for engineers. The conceptual and visual representation of limits, continuity, differentiability, and tangent line approximations for functions at a point. Applying the power rule, product rule, quotient rule and chain rule to functions explicitly and implicitly for finding derivatives. Applying the fundamental theorem of calculus to evaluate definite integrals. Performing accurately improper integrals, definite and indefinite integration, and integration by parts, substitution, and inverse trigonometric substitution.

2nd Semester

CE112 Engineering Drawing

This course provides basic principles on the geometric drawing and general understanding on orthographic drawing of the objects by using first or third angle projection. This course also gives students ability to use basic AutoCAD commands for the detailed 2-D drawings of engineered objects.

COM108/ORT108 History/Tarih

The course provides a detailed exposure on the history of the construction of the Turkish Republic under the light of Kemal Atatürk's principles this course is designed for Turkish speaking students. COM108 is designed for non-Turkish speaking foreign students. The aim of the course is to introduce a brief history of Turkish Republic and Cyprus. Social, economic and political aspects and effects of Western Civilization on Turkey and Cyprus. Relations with Middle East.

Bu derste, Türk Ulusu'nun kurtarıcısı, Cumhuriyetin kurucusu, dünyanın ender yetiştirdiği asker ve devlet adamı, devrimci ve düşünür Atatürk'ün hayat hikayesinin yanı sıra, bir imparatorluğun çöküşü, Türk Ulusu'nun Atatürk'ün önderliğinde kahramanlık destanları yaratarak bağımsızlığını savunuşu, genç ve dinamik Türkiye Cumhuriyeti'nin kuruluşu ve bu Cumhuriyetin hızla yükselişi "Türk İnkılabı" adı verilen büyük atılım ve değişikliklerin ne kadar zamana sığdırıldığı ve bu inkılapların önemi vurgulanmakta ve Atatürk İlkeleri anlatılmaktadır.

COM110 English II

This course is the continuation of the COM101 English I course. Similar issues are focused on as in the former course with a higher tone of language. This course integrates all four language skills

and teaches students how to integrate skills and content in real-world academic contexts. High-interest and intellectually-simulating authentic materials are used to familiarize students with academic content. The course also aims at developing the ability to participate in exchanges of information and opinions in the context of the specific field, and to write instructions, descriptions and explanations about topics in the related field. Extra importance is put on teaching student's terminology related to the specific field. (pre-requisite: COM101)

COM122 Physics II

This course aims to introduce fundamental concepts of physics for engineering science and to provide essential background for engineering students. The course provides deep understanding of thermodynamics, electricity and magnetism. Also, the course aims to show the students the engineering applications of the course material.

ENG122 Physics II Lab

This course is directed with COM122-Physics II. The aim of course is providing a medium for students to see the experimental applications of thermodynamics, electricity and magnetism. The course supports students to validate the underlying theory through experiment and observation.

MATH109 Linear Algebra

Systems of linear equations. Elementary row operations, echelon forms, Gaussian elimination. Matrices, power of matrices, determinants, inverses, diagonal matrices. Cofactor expansion via row reduction. Cramer's rule and evaluating determinants. Vector spaces, linear independence, basis, dimension inner product spaces, Euclidean spaces. Linear transformation systems. Eigenvalues and eigenvectors; and eigenvalue/eigenvector applications.

MATH110 Calculus II

Techniques of integration, integration by parts, trigonometric substitution, integration of rational functions, integration of trigonometric integrals. Application of integrals, areas between curves, volume, volumes by slicing, volumes by cylindrical shells, arc length, area of a surface of revolution, moments and centre of mass. Parametric equations, curves defined by parametric equations, calculus with parametric equations, derivation, area and arc length calculations. Polar coordinates, plotting with polar coordinates, derivation and integration with polar coordinates. Sequences, series, integral tests and estimates of sum.

3rd Semester

CE201 Surveying

Introduction. Understanding scale. Differential levelling. Rise and fall. Height of collimation method. Distance measurements. Total Stations and Theodolites. Traverse surveys. Angular measurements. Stadia survey. Area computations. Earthwork Quantities. Contour lines.

CE207 Materials Science

Engineering requirements of materials; the structure of matter; atomic arrangements, structural imperfection, atom movements. Mechanical properties of materials. Concepts of force, stress, deformation and strain; elastic, and plastic behavior; viscosity; rheological models. Creep, brittleness, ductility, hardness, fatigue, toughness, resilience, and damping characteristics of materials.

CE211 Statics

Introduction to rigid body mechanics, equivalent force systems. Concepts of moment, couple, resultant. Equilibrium; Free body diagram; equations of equilibrium. Structural analysis; trusses, beams. Properties of surfaces. Area moment and centroids; moment and product of inertia; principal directions.

COM106/ORT106 Turkish/Türkçe

To show the characteristics and rules of operation of Turkish language with examples; to give the students the ability and habit to express their feelings and thoughts accurately and effectively; developing vocabulary through written and oral texts; The aim of this course is to teach the rules of reading texts or the programs they listen to correctly. COM 106 course aims to provide basic Turkish reading, speaking and writing skills for international students.

Bu derste, yazı dilinin ve yazılı iletişimin temel özellikleri, yazı dili ile sözlü dilin arasındaki farklar, Yazılı ve sözlü anlatım; öznel anlatım, nesnel anlatım, paragraf türleri, metnin tanımı ve metin türleri, yazılı anlatım, yazılı anlatım, planlı yazma aşamaları (konu, konunun sınırlandırılması, amaç, bakış açısı, ana ve yan düşüncelerin belirlenmesi, yazma planı hazırlama, kağıt düzeni) bilgilendirici metinler üzerinde kuramsal bilgiler: örnekler üzerinde çalışmalar ve yazma uygulamaları, bir metnin özetini ve planını çıkarma, yazılı uygulamalardaki dil ve anlatım yanlışlarını düzeltme ve sözlü anlatım uygulamaları işlenmektedir.

MATH201 Ordinary Differential Equations

Definition and classification of differential equations. Solution of first order linear differential equations, initial value problems, homogeneous differential equations, non-homogeneous differential equations, Bernoulli equations, higher order differential equations, Cauchy Euler equations, Laplace transforms and properties of Laplace Transforms.

4th Semester

CE202 Strength of Materials

Simple stress and strain. Equilibrium, compatibility and constitutive relations, state of stress and state of strain with emphasis on two dimensional problems. Bending and shear stresses. Shear and bending moment diagrams by integrating and section method. Deflection of beams. Torsion of circular shafts. Combined stresses. Buckling of columns.

CE206 Dynamics

Kinematics of particles and rigid bodies absolute motion, relative motion. Kinetics of particles equation of motion, work-energy and impulse-momentum. Systems of particles. Kinetics of rigid bodies Euler's equation, plane motion of rigid bodies, kinetic energy of rigid bodies. Introduction to the dynamics of vibrating systems.

CE208 Materials of Construction

Cement production, cement types, aggregates, metal, bituminous materials, clay products, timber, building stones, lime, and gypsum. Constituents, theories of mix design, principal steps in production, physical and mechanical and mechanical properties of concrete.

MATH224 Engineering Maths

The concept of numerical error, solution of nonlinear equations with root finding. Solution of linear systems of equations and their convergence. Direct and iterative methods for the solution of linear algebraic equations. Polynomial interpolation and extrapolation. Curve fitting for least squares line and polynomial fitting with data linearization method. Numerical differentiation for Lagrange and Newton polynomials, numerical integration with quadrature formulas and their error analysis. Numerical solution of ordinary differential equations.

MATH226 Probability & Statistic Methods

Descriptive statistics for example the meaning of mean, mode and median, cumulative frequency plots and quartiles, percentiles. Histograms and bar charts similarities and application areas. Review of sets, events, and probability. Probability distribution/density functions, for discrete and continuous variables. Joint distributions, marginal distributions, conditional distributions and statistical independence. Moments of random variables, such as mean, variance covariance and correlation. Functions of random variables and their expectations. Discrete random variables and discrete probability distributions; continuous random variables and continuous probability distributions.

5th Semester

CE300 Summer Training I

Preparing of standard engineering drawings. Surveying. Construction materials. Quantity estimates.

CE301 Soil Mechanics

Introduction to engineering problems involving soils. Basic characteristics of soils, classification and compaction of soils. Principle of effective stress. Permeability and flow of water (seepage) in soils. Shear strength of soils. Slope stability. Lateral earth pressure theories. Consolidation theory.

CE303 Structural Analysis I

Unsymmetrical bending, shear center. Definition, classification, idealisation and modelling of structure. Analysis of statically determinate structures, including beams, frames and arches. Analysis of cables. Work and energy principles and their application in deformation analysis of structures. Force method of structural analysis.

CE307 Fluid Mechanics

The nature of fluids and basic introductory concepts. Viscosity of fluids. Pressure measurement. Forces due to static fluids. Buoyancy and stability. Flow of fluids and Bernoulli's equation. General energy equation. Flow types and losses. Flow measurement. Forces due to fluids in motion.

CE309 Construction Economy

Engineering economy principles. Cash-flow diagrams. Time effect on money. Formulas for reflecting time effect on money. How to value money that was spent before and how to value if it will be spent in the future while comparing different alternatives at present. Interest rate, simple interest rate, compound interest rate and compounding periods. How different compounding periods affecting the total amount of interest earned from the deposit. Why different alternatives need to be compared on economical basis. What is feasibility? Comparing different alternatives, examples. Minimum rate of return, attractive rate of return. Replacement and economic life concepts and problems about replacement concept by following different evaluation techniques.

6th Semester

CE302 Transportation and Traffic Engineering

Detailed study of transportation planning process. Inventory of existing travel demand. Different types of O-D studies, analysis and model building. Trip generation, trip distribution model split and trip assignment techniques, forecasting and plan evaluation. Vehicle, highway and travel facts. Vehicle operation characteristics. Stopping and passing sight distance. Zero line application, simple horizontal curve, compound and reverse curves, transition length and super elevation. Basic definitions and computations of level of service. Setting out circular and transition curves. Earthwork volumes.

CE304 Structural Analysis II

Introduction to structural analysis. Displacement methods slope deflection, moment distribution, special topics. Stiffness method, derivation of element stiffness matrices, assembly procedures. Computerized implementation of the stiffness method and use of instructional programs. Large scale structural analysis. Influence lines and moving loads.

CE306 Foundation Engineering

Site investigations, retaining structures, excavations, shallow foundation design, bearing capacity, settlement, stress distribution in soils, initial settlement, consolidation settlement, permissible settlement, deep foundation design, bearing capacity, types of piles, ground improvement.

CE308 Hydromechanics

Introduction. General Characteristics of Flow in Closed Conduits. Fully Developed Flow in Closed Conduits. Computation of Flow in Single Pipes. Non-uniform Flow in Closed Conduits. Pipes in Series and Pipes in Parallel. Branching Pipes. Hydraulics Operation of Pumped Discharge Lines. Gravity Pipelines. General Characteristics of Open Channel Flow and Uniform Flow. Specific-Energy Concept and Critical Flow. Rapidly Varied Flow. Specific Force Concept. Conjugate Depths. Gradually Varied Flow. Design of Open Channels for Uniform Flow.

7th Semester

CE402 Summer Training II

Subjects available Surveying, quantity and cost estimates. Construction materials. Site applications. Reinforced concrete, structural, hydraulic and highway design. Preparing standard engineering drawings.

CE403 Reinforced Concrete Fundamentals

Concept of design Structures. Limit state theory, concept of safety, definition of reinforced concrete element. Criterion of failure of axial loading. Section under binding and axial load, cracking and limit states. Stress distribution of compression zone of concrete. Bending combined with axial loading. Internal forces. Equilibrium equations. Design tables and curves for a rectangular section. Providing safety for shear in columns and beams. Providing safety for shear in columns and beams. Design of Beams and Frames. Torsion. Bond, anchorage, splices of reinforcement. Ductility. Beam-column joints. Design specifications. Slabs with beams. One way slabs. Two-way slabs. Design specifications.

CE405 Fundamentals of Steel Design

General concepts in design. Design methods, loads (dead, live, wind, snow and earthquake), codes, safety, and serviceability. Behavior of steel structures. Tension members, compression members, beams, beam-columns, types and behavior of connections in steel structures, bolted and welded connections. Introduction to computer aided design using SAP 2000-Educational.

CE415 Construction Management

Profile of construction sector; company and site organization. Documents in a contract file, types of contracts. General specifications for public works. Technical specifications. Working schedules; manpower and equipment requirements on the job. Quantity measurement monthly payments. Final account and payment. Safety in construction. Economical and juridical basis of

construction planning. Methods of planning. Gantt charts, networks. CPM and PERT Arrow and present system. Rock drilling and blasting operations.

CE417 Water Resources Engineering

Introduction. Reservoirs. Dams. Spillways. Water Supply. Wastewater. Irrigation and drainage. Sustainable Drainage Systems (SuDS). Rainwater harvesting.

CE419 Graduation Project I

This course is designed to be the stepping stone for CE420 - Graduation Project II. Students need to choose one of the disciplines (Structures, Transportation, Construction, and Hydraulics) to their interests and prepare a project proposal. The course will be supervised by a tutor assigned by the Department. Upon satisfactory completion, literature review, preliminary analysis must be completed for the co-requisite course. Students may work as an individual or as part of a group.

BUSN461 Strategic Planning and Management

The course aims at providing the advanced insights of strategic management perspective on key business decisions. The course primarily focuses on the corporate strategic planning process, strategy formulation, the impact of micro and macro environment on strategic decision making.

8th Semester

CE450 Graduation Project II

This is the capstone course for students in civil engineering. It is designed to bring together the knowledge and skills learnt in the major engineering courses and the minor or further specialization option. Students may work as an individual but they are highly encouraged to work on an interdisciplinary project as part of a group. Students are expected to submit a detailed final report which documents the design, implementation and testing that also needs to be presented to the jury consisting Academic Members.

ENGG434 Engineering Ethics

Ethics and professionalism, moral reasoning, moral frameworks, ethical theories, commitment of safety, risks, workplace responsibilities, honesty, equal opportunity: non-discrimination, confidentiality and conflicts of interest, environmental ethics, green engineering, sustainable development, dilemma resolution, professional rights, whistleblowing. Code of ethics: The Institute of Electrical and Electronics Engineers, American Institute of Chemical Engineers, American Society of Civil Engineers, Software Engineering. Basic ethics training. Engineering professional training, job responsibilities and professionalism, labor law and ethics. Case studies on the topics of engineering professional ethics, labor safety, and environmental protection. Computers and ethics, data protection, computer failures. Global issues.

ELECTIVE COURSES

CE472 Advanced Materials of Construction

Microscopic properties. Isotropy, homogeneity and continuity. Mechanical properties. Elasticity, anelasticity and work-hardening. Plasticity, creep and relaxation. Visco-elasticity, elastic, plastic and various models. Fatigue and hysteresis. Stress-strain relations. Generalized Hooke's law. Plastic deformations field criteria and failure.

CE429 Admixtures for Concrete

Definition of term an admixture for concrete. Effect of surface-active substances on process of cements hydration and microstructure development. Chemical and mineral admixtures. Performance of air-entraining admixtures, water- reducing, retarding, and accelerating admixtures. Natural pozzolans, fly ash, silica fume and ground granulated blast furnace slag. Behavior of fresh and hardened concrete modified with different admixtures.

CE465 Construction Project Scheduling

Basic construction project scheduling procedures. Work breakdown structure, critical path method, and scheduling logic. Activity durations, status reports, resource allocation, and control.

CE471 Advanced Concrete Technology

Hydration of Portland cement; chemistry, compound interactions, hydration products and microstructure, volume changes during hydration. Admixtures for concrete and their effects on concrete properties. Properties of fresh concrete. Properties of hardened concrete. Concrete mix design methods. Curing methods of concrete. Special types of concrete. Durability of concrete. Concreting in hot weather and concreting in cold weather. Quality control. Thermal properties of concrete.

CE442 Advanced Reinforced Concrete Design

Behavior and strength of members under combined shear and torsion design reinforced concrete beam for shear, torsion and bending. Serviceability of beams and one-way slabs deflection behavior and control. Structural systems framed, wall and combined structures, flat slabs and plates. Seismic design principles. Modeling and design with SAP 2000 Educational. Advanced methods of construction prefabricated and prestressed concrete composite structures. Repair and strengthening of structures.

CE444 Highway Materials

Properties, performance, and standard test methods of the basic materials used in highway engineering (asphalt, aggregates, binders, and concrete), the selection criteria, quality control processes, and performance evaluations of materials used in road construction.

CE485 Irrigation and Drainage Engineering

Introduce the engineering principles of irrigation and drainage systems, to ensure efficient water use in agricultural production, and to develop an understanding of soil-water-plant interactions, modern irrigation and drainage techniques, plan and manage sustainable agricultural practices.

CE490 Safe Road Design

Introduce the fundamentals of safe road design by examining road safety principles from an engineering perspective, understanding of road safety by learning design criteria, risk factors, and engineering solutions to improve road user safety.

CE426 Highway Engineering

Fundamental principles of highway engineering and the engineering knowledge and skills necessary for the planning, design, construction, and maintenance of road projects, factors affecting highway design, material selection, traffic loads, and road safety criteria for practical applications.

FREE ELECTIVE COURSES

CFE201 Leadership and Management

In this course, an analysis of theoretical and practical knowledge is made. In this context, basic social and psychological factors associated with the concept of leadership and current theories will be explained and how theoretical knowledge can be applied in terms of leadership and management functions in organizations will be emphasized. The aim of the course is to provide students with a deep understanding of leadership and management concepts and to develop their own leadership skills.

CFE202 Environment and Sustainable Development

This course provides information on nature and environment along with sustainability concept, as well as guides students to gain awareness about environmental problems. It aims to inform students about the daily practices that will lead to a more sustainable living. Additionally, knowledge about the global and social effects of all practices on health, environment, safety, and current issues related to the field of their area of study and awareness of the legal consequences of their specific area of practices to solutions are covered.