BSCE Program Courses Catalogue

Following is the Bachelor of Science in Civil Engineering (BSCE) program curriculum of the Civil engineering department. The BSCE is accomplished in five academic years having two levels in each academic year. The five academic years involve one preparatory year with no core courses and four years in the civil engineering field. The curriculum presents the credit units and weekly contact hours, either for lectures or for practical work for all courses. The curriculum also presents summer training which starts at the end of the eighth level, and senior project which begins at the ninth level and continues to the end of the tenth level.

Course Code	**MATH101-3**			
Course Title	**General Mathematics**			
Hours	**Credit**	**Lec.**	**Lab.**	**Tut.**
	3	**3**	**-**	**-**
Prerequisites	**NONE**			

Course Description	The course aims to provide the student with the basic concepts Algebra operations, exponents and radicals, polynomials, complex numbers, required for understanding and solving equations and inequalities, function and its graph, matrix operations and system of linear equations by Gauss-Jordan method.

Course Code	**MATH211-3**			
Course Title	**Calculus 1**			
Hours	**Credit**	**Lec.**	**Lab.**	**Tut.**
	3	**3**	**-**	**-**
Prerequisites	**MATH101-3**			

Course Description	The course aims to provide the student with the basic concepts required for understanding and solving the problems in functions, limits, continuity, differentiations and their applications.

Course Code	**PHYS101-4**			
Course Title	**General Physics**			
Hours	**Credit**	**Lec.**	**Lab.**	**Tut.**
	4	**3**	**2**	**-**
Prerequisites	**NONE**			

Course Description	The course is designed to provide students with: - The basic physics of units & measurements, dimensional analysis of physical quantities, vectors, rigid body kinematics and dynamics, rotational motion, elasticity, gravitation, oscillatory motion and sound waves. - Acquaint students with sufficient knowledge and understanding of physics behind various phenomena and scientific/Engineering applications. - Mathematical ability in simple derivation and manipulation of physical formulae. - Problem-solving skills in related fields of physics. - Lab measurements, recording, data analysis and reporting.

Course Code	CHEM106-4			
Course Title	General Chemistry			
Hours	Credit	Lec.	Lab.	Tut.
	4	3	2	-
Prerequisites	NONE			

Course Description	This course aims to give students knowledge in the following fields: Chemical Foundations, Atoms, Molecules, and Ions, Stoichiometry, Types of Chemical Reactions and Solution Stoichiometry, Gases, Thermochemistry, Chemical Equilibrium, Acids and Bases, Properties of Solutions, Organic and Biological Molecules.

Course Code	MATH228-3			
Course Title	Calculus 2			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	MATH211-3			

Course Description	The course aims to provide the student with the basic concepts required for understanding and solving the heat transfer problems applied on engineering. Concepts and definitions of steady state one dimension heat conduction. Free and forced Convection inside and outside surfaces. Radiation between surfaces. Heat Exchanger Types.

Course Code	PHYS203-3			
Course Title	Physics 2			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	2	1
Prerequisites	PHYS101-4			

Course Description	This course is designed to provide students with: - Fundamental of fluid mechanics including static and dynamic fluids. - Principles of thermodynamics including work and heat, laws of thermodynamics, energy transfer, and heat engines. - Basic of electrostatics including Coulomb‘s law, electric field, Gauss‘s law, electric potential and capacitor. - Electric current, resistance, electric power and magnetic field. - Lab measurements, data collection, analysis and reporting.

Course Code	ME131-2			
Course Title	Engineering Drawing			
Hours	Credit	Lec.	Lab.	Tut.
	2	0	5	0
Prerequisites	NONE			

Course Description	Technical drawing is the language of engineering. The objective of this course is to learn initially the basic principles involved in the projection of points, lines, lamina and solids. As well this course is focused towards the interpenetration of solids, development of surfaces, isometric drawings and some basics of computer aided drafting software. It is expected that a student should learn this subject in a very systematic way to develop the skill to express effectively his idea about an object to others through drawings.

Course Code	EE111-3			
Course Title	Fundamentals of Electrical Engineering			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	2	1
Prerequisites	PHYS101-4			

Course Description	This course will give students a sufficient background on circuit analysis in a manner that is clearer, more interesting, and easier to understand. All principles of electrical circuits are presented applying both DC and AC electrical sources. Basic concepts of electrical theory are presented including main laws and theorems used to solve different problems in basic circuit analysis and their applications.

Course Code	ME132-2			
Course Title	Engineering Design			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	2	-
Prerequisites	ME131-3			

Course Description	This course illustrates the steps of engineering design for different applications.

Course Code	MATH319-3			
Course Title	Calculus 3			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	MATH228-3			

Course Description	Calculus (3) course contents are: Multivariate functions studying (limits, continuous and partial derivation function), and studying Double, Triple integrals and application.

Course Code	CHEM206-3			
Course Title	Chemistry 2			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	-	2
Prerequisites	CHEM106-4			

Course Description	This course aims to give students knowledge in the following fields: Applications of Aqueous Equilibria (Acid–Base Equilibria, Solubility Equilibria, Complex Ion Equilibria), Chemical Kinetics, Thermodynamics-2, Transition Metals and Coordination Chemistry, Nuclear Chemistry, Electrochemistry, The Representative Elements (Groups 1A Through 4A, Groups 5A Through 8A), Organic and biological molecules (Polymers, Natural Polymers).

Course Code	CE111-3			
Course Title	Statics			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	-	2
Prerequisites	PHYS101-4			

Course Description	This course introduces vectors, scalars and applies the parallelogram laws. Through this course, student calculate the reactions and the moment using the equilibrium equations for 2-D. This course will introduce also, the forces in truss members. The student will be able Analysis of bodies to evaluate center of gravity of masses, centroid of lines and areas. In addition, students will be able to calculate moments of inertia for a single area, and the utilization of parallel axes theorem to compute centroidal moments of inertia for composite areas.

Course Code	ME133-3			
Course Title	Dynamics			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	-	2
Prerequisites	PHYS101-4			

Course Description	This course is designed to introduce students to kinematics and kinetics of particles and rigid bodies. Students will learn how to relate forces to acceleration using Newton's second law, to displacement using principle of work and energy, and to time using principle of impulse and momentum.

Course Code	MATH336-3			
Course Title	Differential Equations			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	MATH319-3			

Course Description	The course aims to provide the student with the basic concepts required for understanding and solving the differential equations & Laplace transforms and how to applied on applications in engineering. Concepts and definitions of ODE and PDE and also Laplace transform to solving differential equations.

Course Code	CE212-2			
Course Title	Civil Engineering Drawing			
Hours	Credit	Lec.	Lab.	Tut.
	2	1	3	-
Prerequisites	ME131-2			

Course Description	This course is intended to teach students the fundamental concepts in Civil Engineering Drawing dealing with different components viz. Reinforced Concrete and steel structures. Reinforced Concrete structures consists of foundation, beams, columns, slabs and steel structures consists of different steel sections, column base, Beam to beam connections, Column to beam connection, truss.

Course Code	ME211-3			
Course Title	Thermodynamics			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	PHYS203-3			

Course Description	This course is concerned with the thermodynamic systems, work and heat, the first and second laws of thermodynamics, cycles, phase equilibrium, reversibility, entropy, applications of the first and second laws of thermodynamics in refrigeration and air conditioning systems.

Course Code	CE213-3			
Course Title	Strength of Materials			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	1	2
Prerequisites	CE111-3			

Course Description	This course covers and concentrates on the structural analysis and properties of engineering materials. It also focuses on the relationships between stresses and strains.

Course Code	CE251-3			
Course Title	Fluid Mechanics			
Hours	Credit	Lec.	Lab.	Tut.
	4	3	2	1
Prerequisites	PHYS203-3			

Course Description	This course deals with hydrostatic pressure and the flow through closed pipes and defining the flow regimes. The course includes the pressure drop and open channel study.

Course Code	STAT354-3			
Course Title	Statistics and Probability			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	MATH211-3			

Course Description	Description of single-variable data; organizing, displaying, and summarizing the data in measures of central tendency and of dispersion, Simple linear regression and correlation, Theory of Probability, and Random Variables; discrete and continuous, and Probability Distributions; density and mass functions, are the main topics to be covered by this course.

Course Code	CE214-3			
Course Title	Materials of construction			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	2	1
Prerequisites	CE213-3			

Course Description	This course provides to students the basics of the knowledge to general properties of construction materials. In addition to providing the students with the important basics to learn about the characteristics and components the ferrous metals (steel rebar), cement, aggregates, additives (admixtures) and concrete, as well as cncrete mix design, in addition to mixing, casting and curing in hot weather.

Course Code	CE215-3			
Course Title	Structural Analysis 1			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	-	2
Prerequisites	CE213-3			

Course Description	This course aims to introduce general review on types of structures, loads, axes systems, and displacements resulting from resistance. Analysis of simply supported beams (straight, inclined and beams with intermediate hinges) as well as analysis of plane frames under different loads. Analysis of arches, calculating deflection of simple supported beams using Conjugate Beam Method. Analysis of continuous beams using three-moment equation. Drawing influence lines for determinate structures.

Course Code	CE231-2			
Course Title	Geotechnical Engineering (1)			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	1	-
Prerequisites	CE213-3			

Course Description	This course is intended to introduce the fundamentals of soil engineering. The course involves the introduction to geotechnical Engineering; Concepts and fundamentals of soil classification, physical properties and compaction behavior of soil. Further, the students will be made familiar with the permeability of soil, stresses in soil, and the settlement of soil due to excessive loads.

Course Code	CE261-3			
Course Title	EnvironnementalMicrobiology			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	CHEM106-4			

Course Description	This course provides a general introduction to the diverse roles of microorganisms in natural and artificial environments. It will cover topics including: cellular architecture, energetics, and growth; evolution and gene flow; population and community dynamics; water and soil microbiology; biogeochemical cycling; and microorganisms in biodeterioration and bioremediation.

Course Code	CE281-2			
Course Title	Surveying (1)			
Hours	Credit	Lec.	Lab.	Tut.
	2	1	2	1
Prerequisites	MATH228-3			

Course Description	This course presents the fundamentals of surveying with particular emphasis on instrumental procedures and simple computation methods. Methods employed for distance measurement, vertical and horizontal control, leveling, and measurement of angles, bearing determination, traverse closure, area determination, and construction layout are considered.

Course Code	CE316-3			
Course Title	Design of Steel Structures			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	-	2
Prerequisites	CE214-3 and CE215-3			

Course Description	An introduction to types and properties of structural steel. A comparison is illustrated between the allowable stress design method, (A.S.D) and the load and resistance factors design method, (L.R.F.D). Drawings of layout of steel structures including wind bracing are presented. Analysis of steel structures at different cases of loading (D.L, L.L and W.L) is done. Factored design forces are determined. Tension and compression members as well as, axially loaded columns are designed. Also, design of bolted and welded connections is included. Detail drawings of the connections are obtained. The course contains design of flexural elements, (floor and roof beams). Excel sheets in the design of tension and compression members are used.

Course Code	CE317-3			
Course Title	Reinforced Concrete Design (1)			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	-	2
Prerequisites	CE214-3 and CE215-3			

Course Description	Assessment and Structural Design of Reinforced Concrete Elements. Evaluating the behavior of reinforced concrete elements through Identifying the fundamentals of Ultimate limit state method and applying to design of beams ,solid slabs subjected to bending moments , and design of short columns subjected to pure compressive force.

Course Code	CE332-3			
Course Title	Geotechnical Engineering (2)			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	3	-
Prerequisites	CE231-2			

Course Description	This course is designed to introduce the concept of shear strength and methods to determine the shear strength parameters. The students will be made aware of site investigation, methods of soil exploration and boring methods. Further, the property of the soil obtained will be used to calculate the bearing capacity, lateral earth pressure, and stability of finite and infinite slopes.

Course Code	CE341-3			
Course Title	Transportation Engineering (1)			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	1	-
Prerequisites	CE281-2			

Course Description	The objective of this course is to teach students the essential components of Transportation Engineering and Principles of Highway Engineering, Stopping and Passing Sight Distances, Geometric Design of Horizontal and Vertical Alignments (Plan and Profile), Transportation Planning, Zoning system characteristics, Data collection, Origin destination matrix, Travel demand forecasting, Trip generation models, Trip distribution models, Modal split and traffic assignment.

Course Code	CE382-2			
Course Title	Surveying (2)			
Hours	Credit	Lec.	Lab.	Tut.
	2	1	2	1
Prerequisites	CE281-2			

Course Description	In this course the main subject of study will be the calculation and methods for the layout of individual control points for the construction of roads and highways based on design requirements(Thacometric Surveying using Total Station instruments). It covers the calculation and layouts of simple circular curves, compound and reverse curves, and vertical curves. This course also presents the fundamental principles of photogrammetry. It covers the photogrammetric optics metric camera calibration, geometry of aerial photographs; photo coordinates measurements and transformation, stereoscopic viewing, parallax and orientations. Flight planning and cost estimation in aerial mapping work are considered. This course also presents the fundamental principles of GPS positioning.

Course Code	MATH410-3			
Course Title	Numerical Methods			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	MATH228-3 and CSC222-3			

Course Description	The course aims to provide the student with the basic concepts required to understanding and solving the Distinguishing mathematical concepts relevant to interpolation, numerical Integration and differential, numerical solution of linear system of equations, numerical solutions of nonlinear equations, and numerical solutions of ordinary differential equations.

Course Code	CE318-3			
Course Title	Reinforced Concrete Design (2)			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	-	2
Prerequisites	CE317-3			

Course Description	This course focuses on the properties and behavior of reinforced concrete structures. Also, on developing the analysis and design procedures of reinforced concrete structural members (shear and torsion in beams, hollow block slabs, flat slabs, stairs, and long columns).

Course Code	IE346-2			
Course Title	Engineering Economy			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	-
Prerequisites	MATH228-3			

Course Description	Introduction to engineering economy science, meaning of cost and economics of operation, the time value of money and the relation between them, techniques of evaluation of present, future and annual value of money, comparing alternatives and decision making, deprecation and its methods of calculation, project valuation and analysis of economical feasibility study, risk analysis, assertion and responsibility feeling, techniques of cost estimation, market survey and replacement rates, study of general budget and income data.

Course Code	CE371-3			
Course Title	Construction Engineering			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	-	2
Prerequisites	CE317-3			

Course Description	This course deals with types, selection, utilization, and unit cost of construction equipment regarding soil compaction and stabilization, excavation and earthmoving operations. This course also deals with formwork design and cost estimation as well as construction project items.

Course Code	CE342-3			
Course Title	Transportation Engineering (2)			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	1	-
Prerequisites	CE 341-3			

Course Description	The purpose of this course is to provide students with fundamental introduction of traffic engineering, such as human factor design, traffic operations including traffic data collection, traffic count methods, traffic flow theory, highway capacity analysis, and sustainable transportation system.

Course Code	CE433-3			
Course Title	Foundation Engineering			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	-	2
Prerequisites	CE317-3 and CE332-3			

Course Description	This course aims to prepare engineering students to analyze and design shallow (isolated, strip, combined, Strap Beam Foundations, Raft Foundation and Piles and Pile Caps) foundations and deep foundations and give sufficient drawings and details of these foundations.

Course Code	CE443-3			
Course Title	Pavement Design			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	1	1
Prerequisites	CE342-3			

Course Description	This course aims to introduce students to pavement design, highway materials and construction , also, highway maintenance. Furthermore, the students will be aware of operation, road safety and pavement management system.

Course Code	CE452-3			
Course Title	Hydrology and Water Resources			
Year / Level	4/9			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	1	-
Prerequisites	CE251-4			

Course Description	This course presents principles of water flow as well as the techniques that can be used to solve hydrologic problems. It shows, the occurrence and distribution of water on Earth is driven by the hydrological cycle. A major objective of the course is to study the individual components of the hydrologic cycle, as well as interactions between these components and their influence on water systems. Knowledge of engineering, hydrology is required for the design of water distribution, drainage systems, reservoirs, and for the management of flooding. The skills and knowledge required carrying out the hydrologic analyses and designs that are often encountered in engineering practice will be provided.

Course Code	CE498-1			
Course Title	Senior Design project (1)			
Hours	Credit	Lec.	Lab.	Tut.
	1	1	3	-
Prerequisites	ENG357-3, CE261-3, CE382-2, CE316-3, CE317-3, CE332-3, CE342-3			

Course Description	In addition to teaching the basic concepts of civil engineering, this course is designed to help the senior student to prepare his proposal for the final project. Topics include: analytical calculations, analysis, design, and preparing drawings and details of the project.

Course Code	CE462-3			
Course Title	Sanitary Engineering			
Hours	Credit	Lec.	Lab.	Tut.
	3	2		2
Prerequisites	CE261-3			

Course Description	Sanitary Engineering course aims to provide the students with a complete knowledge on wastewater collection, conveyance, treatment, disposal methods and design. The course will provide the knowledge of sludge and solid waste management. After completing the course, the students are expected to solve the problems of wastewater and solid waste management.

Course Code	CE472-3			
Course Title	Construction Management			
Hours	Credit	Lec.	Lab.	Tut.
	3	2	-	2
Prerequisites	CE371-3			

Course Description	This course deals with characteristics of construction industry, project delivery systems, the design and construction process, construction contracting, construction planning, and project control. It also deals with conceptual cost estimation, and quality and safety management.

Course Code	Course Name	Prerequisites	Credit Units
CE496-2	Summer Training	ENG357-3 Pass 110 Credit	2

Course Code	CE499-3			
Course Title	Senior Design project (2)			
Hours	Credit	Lec.	Lab.	Tut.
	3	-	7	-
Prerequisites	CE498-1			

Course Description	Designing of graduation project for which the student had prepared a program and chose a location during the first semester – The project should be both complex and comprehensive to show student ability to utilize the experience gained during the study period in the department – the student should be able to meet project objectives.

Elective Courses

Elective (1)

Course Code	CE421-3			
Course Title	Structural Analysis 2			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	CE215-3			

Course Description	Analysis of statically indeterminate structures by classical methods such as: method of slope-deflection, moment distribution and three moment equation. Calculation of deflection for determinate beams and frames by using unit load method. Analysis of tow hinged arches. Influence lines for statically indeterminate structures. Introduction to matrix methods of structural analysis. Computer applications

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Course Code	CE436-3			
Course Title	Soil Stabilization			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	CE332-3			

Course Description	This course has been designed to introduce the soft and weak soil and the method of stabilization using different methods. The geotechnical peoperty of the stabilized soil is determined throught the laboratory method or theoretical method. Further, the effect of the peoperty of the stabilized soil is studied on the lateral earth pressure. This course will further make the student aware with the design of dewatering system for soil stabilization.

Course Code	CE446-3			
Course Title	Pavement Evaluation			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	CE342-3			

Course Description	This course will help the students to evaluate highway paving materials, also, to evaluate and design of asphalt paving mixtures.

Course Code	CE456-3			
Course Title	Ground water			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	CE452-3			

Course Description	The objective of the course is to provide to the students a quantitative understanding of the hydraulics of subsurface fluid flow. The theoretical concepts will be reinforced through solving real-world design and analysis problems. The importance of study of subsurface flow will be emphasized since about one-third of the world's fresh water resources exist in the form of groundwater. Further, the subsurface water forms a critical input for the sustenance of life and vegetation in arid zones. The course will cover various aspects of groundwater related to its exploration, development, and utilization.

Course Code	CE466-3			
Course Title	Water and waste water treatment			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	CE452-3			

Course Description	The design of physical unit operations and chemical and biological unit process for water and wastewater treatment are emphasized. The primary goals are to provide detailed coverage of the procedures that are used to design water and wastewater plants for municipalities and introduce students to the engineering and scientific principles on which these are based.

Course Code	CE486-3			
Course Title	Survey Measurements Adjustment			
Hours	Credit	Lec.	Lab.	Tut.
	3	3	-	-
Prerequisites	CE382-2			

Course Description	This course is intended to introduce the fundamentals of errors propagation and methods for analyzing them.

Elective (2)

Course Code	CE422-2			
Course Title	Structural Analysis 3			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE421-3			

Course Description	This course will introduce students to the Analysis of indeterminate structures by using numerical methods, flexibility method and stiffness method. Moreover, this course will include introduction to finite element method and computer application.

Course Code	CE423-2			
Course Title	Advanced Reinforced Concrete Design			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE421-3			

Course Description	This course is intended to complete the topics of reinforced concrete design that not covered in compulsory courses. The course involves the study of check-deflection in flexural elements. An introduction to Prestressed concrete is also involved. This course focuses also on the seismic design of reinforced concrete structures. Finally the course includes computer applications and engineering drawing of reinforced concrete details.

Course Code	CE424-2			
Course Title	Advanced Steel Structures Design			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE421-3			

Course Description	This course will introduce students to analyze and design crane track girders and roof beams (purlins). Design of sections subjected to bending moment and normal force (frame elements). Design of bolted connections subject to different types of straining actions, (shear, tension, bending moment, individually and combination of these forces and moments). Design of hinged and fixed steel bases. Drawing of all details of members and connections. Computer application is used in the design.

Course Code	CE437-2			
Course Title	Soil Dynamics			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE436-3			

Course Description	This course aims to introduce concept of soil dynamics, different type of dynamic loads, and its effect on the soil property such as bearing capacity. For the effective understanding of the above, basics of vibration (free and forced), degree of freedom and the damping has been included. In addition, the evaluation of the dynamic bearing capacity of the soil and the dynamic load transferred to the soil due to operation of the machine has also been included.

Course Code	CE447-2			
Course Title	Construction and Maintenance of Highway			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE446-3			

Course Description	This course will introduce students to essential terminologies and concepts of preservation existing highway asphalt pavements; characterizing flexible pavement distresses and identifying possible cause of distresses; relating pavement distress types and distress severity to cost-effective repair alternatives; simple procedure to inventory pavement conditions and select maintenance methods

Course Code	CE457			
Course Title	Harbor and Coastal Engineering			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE 456			

Course Description	This course deals with planning and design of harbors elements. It includes the hydrodynamics of waves, wind, tidal, and the wave forces on the coastal structures. Design of breakwaters, berths is presented through the course

Course Code	CE467-2			
Course Title	Design of Water and Wastewater Treatment Plants			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE466-3			

Course Description	This course is intended to teach students the design concepts for Water and Wastewater Treatment Plants with different process such as physical, chemical, and biological. The design of treatments units such as Screens, sedimentation tank, coagulation and flocculation, Activated sludge process etc.

Course Code	CE476-2			
Course Title	Advanced Methods of Construction			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE371-3			

Course Description	The course will introduce unique construction methods involved with several types of complex construction projects. The construction process will be discussed as a system to provide a background for examining various types of projects including modern concretes and infrastructurs, temporary structures, high-rise construction, deep foundations construction, dams, bridges, tunneling and shotcretes, and other complex construction issues.

Course Code	CE487-2			
Course Title	Geodesy and Geomatics			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE486-3			

Course Description	This course is started by introducing the history of geodesy that is related to the determination of the figure of the earth. It is consists of earth coordinate system, geodetic coordinate system, celestial and natural coordinate systems, geodetic datum and its transformation, and computation of geodetic coordinate from geocentric coordinate.

Elective (3)

Course Code	CE438-2			
Course Title	Foundation and Earth Structure Design			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE436-3			

Course Description	This course will prepare students to detail designing of shallow foundation using Terzaghi and Meyerhof's method, also, deep foundation through using c-□ and SPT methods.

Course Code	CE448-2			
Course Title	Traffic Safety			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE446-3			

Course Description	This course will introduce students to traffic engineering studies and measurement; traffic flow theory and queuing theory; highway capacity analysis; parking analysis and layout design; traffic signs, marking and channelization; signalized intersection design and operation; roundabout design and management; ITS applications in traffic engineering; computer application in traffic engineering.

Course Code	CE458-2			
Course Title	Water Resources Planning			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE456-3			

Course Description	This course is designed to provide an up-to-date broad coverage of pertinent topics concerning water resource planning and management. Modern computer-based modeling and analysis methods that have greatly increased capabilities for solving water resources engineering problems will be discussed. Water resources engineering concepts and methods will be addressed from the perspective of practical applications in water management and associated environmental and infrastructure management. Simulation and optimization models for the management and planning of water resource systems will be discussed. Design and analysis of water distribution as well as hydropower systems will be an important component of the course.

Course Code	CE468-2			
Course Title	Municipal Solid Waste Management			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE466-3			

Course Description	This course will introduce students to Sources, composition and properties of municipal solid wastes. Moreovre, it will include functional elements of solid waste management systems, integrated solid waste management, materials separation and processing technologies, thermal, biological and chemical conversion technologies.

Course Code	CE477-2			
Course Title	Construction Organization and Planning			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE371-3			

Course Description	This course examines the management focus of the design and/or construction company and how corporate management is different from, yet relates to, and impacts project management. The company creates the framework within which projects may consistently achieve excellent performance or they may struggle to complete behind schedule, over budget, and not meet the customer's requirements. What makes the difference?

Course Code	CE488-2			
Course Title	Remote Sensing			
Hours	Credit	Lec.	Lab.	Tut.
	2	2	-	1
Prerequisites	CE486-3			

Course Description	This lecture course provides an overview of Geographic Information Systems technology. Topics include fundamental concepts, terminology, and technologies associated with GIS, applications of GIS, the role of GIS in spatial data management, data modeling, concepts of file and database systems, spatial data models, architecture of GIS software, methods of data collection and input, manipulation and analysis features of GIS, general management issues. In addition, remote sensing is defined as the science of acquiring, processing, and interpreting images, and related data, obtained from aircraft and satellites that record the interaction between matter and electromagnetic radiation.