

University of Baghdad



جامعة بغداد

First Cycle – Bachelor's degree (B.Sc.) – Civil Engineering

بكالوريوس هندسة - هندسة مدنية



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1. Overview

This catalogue is about the courses (modules) given by the program of Civil Engineering to gain the Bachelor of Science degree. The program delivers (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامة

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة المدنية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية، مع (6000) إجمالي ساعات حمل الطالب و 240 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
CE101	Engineering Mechanics1	7.00	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	2	93	82
Description			
<p>Introduction (scalar and vector quantities, units and convertor of units). Forces (definition, resolution of forces in 2-D and 3-D, resultant of two rectangular and non-rectangular forces, resultant of a concurrent coplanar force system). Moment of a Force (definition, moment of a force in 2-D and 3-D, couples and transformation of a couple). Resultant of Forces (resultant of a non-concurrent coplanar force system, resultant of a parallel force system in 2-D and 3-D). Equilibrium (basic concepts, free body diagram, types of supports and reactions, types of loading and analyzing of plane frame structures). Trusses (definition, analyses of trusses by joint and section methods). Center of Areas (Centroid) (definition, centroid of geometrical areas, centroid of functional areas and centroid of composite areas). Second Moments of Areas (Moments of Inertia) (definition, moment of inertia of geometrical areas, moment of inertia of functional areas and moment of inertia of composite areas). Product of Inertia for an Area (definition, product of inertia for geometrical areas, product of inertia for functional areas and product of inertia for composite areas).</p>			

Module 2

Code	Course/Module Title	ECTS	Semester
CE103	Building Material/1	4.00	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	37
Description			
<p>Building types are determined by the methods of design and construction and loading. Main factors to be consider in construction. Mechanical properties include normal stresses, compressive stresses, tensile stresses, strength and ultimate strength, strain, and stress-strain relationship, elasticity, plasticity, and modulus of elasticity. Engineering properties include reduction and elongation in area, ductility, toughness, brittleness, resilience, creep, fracture, fatigue, stiffness, and hardness.</p> <p>Bonding Materials. Gypsum plaster. Raw materials - Gypsum rocks. Manufacture of gypsum plaster. Raw Gypsum. Natural Gypsum. Hemi Hydrated Gypsum. Natural Anhydrous gypsum. Manufactured Anhydrous gypsum. Gypsum products. Ordinary plaster, Bourak, Technical plaster. Lime. limestone rocks. Quick lime CaO. Hydrated lime Ca(OH)₂. Lime paste. hydraulic lime. semi-hydraulic lime. Fatty lime. Magnesia lime. Classification of lime. Manufacture of lime - Theory of calcinations. Requirements of lime. Properties of quick lime, Plasticity, Sand- carrying capacity, Setting time, Tensile and compressive strength of lime mortars. Hydrated lime.</p> <p>Brick, clay brick, raw materials, harmful ingredients, molding, manufacturing, classification and limitations according to Iraqi standards, Types of bricks. Sand lime brick, Concrete brick. ll materials were detected both theoretically and experimentally.</p>			

Module 3

Code	Course/Module Title	ECTS	Semester
CE107	Mathematics/ I	5.00	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	0	63	62
Description			
<p>This course introduces the basic concepts and techniques of differential calculus and their applications to engineering problems. The course covers the following topics:</p> <ul style="list-style-type: none"> • Limits and continuity: how to evaluate limits of functions using algebraic, and graphical, and how to determine the continuity of functions at a point or over an interval. • Type of functions, domain, and range: how to identify different types of functions, such as polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric, hyperbolic and inverse hyperbolic functions, and how to find their domain and range. • Rules of derivatives: how to use the definition of the derivative as a limit of the difference quotient, and how to apply the rules of derivatives, such as sum, difference, product, power, chain, and implicit rules, to find the derivatives of various functions. 			

- Graph of functions: how to use derivatives to analyze the behavior and properties of functions and their graphs, such as increasing and decreasing intervals, concavity, and inflection points.
- Applications of differentiations: how to use derivatives to solve engineering problems.

Module 4

Code	Course/Module Title	ECTS	Semester
CE109	Physics Fundamentals	2.00	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	33	17
Description			
<p>Thermal performance of buildings, Heat transfer through materials, Thermal insulation and its benefits, Heat gain and heat loss estimation, Factors affecting the thermal performance of buildings, Thermal measurements, Principles of natural ventilation, Ventilation measurements, Design for natural ventilation, Air conditioning systems for different types of buildings. Acoustics, Classification of sound, Absorption coefficient and its determination, Factors affecting acoustics of buildings and their remedies, Methods of sound absorptions, Absorbing materials, Noise and its measurements, Sound insulation and its measurements, Impact of noise in multistoried buildings. Hazards, Seismology and seismic waves, Earthquake ground motion, Basic concepts, and estimation techniques, Site effects, Probabilistic and deterministic seismic hazard analysis, Cyclone and flood hazards, Fire hazards and fire protection, Fire-proofing of materials, Fire safety regulations and firefighting equipment, Prevention and safety measures. Protection against fire to be caused by A.C. Systems.</p>			

Module 5

Code	Course/Module Title	ECTS	Semester
CE110	Engineering Drawing	7.00	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	3	108	67
Description			
<p>Engineering Drawing is the universal means of communication for engineers, technicians and craftsmen. Engineering Drawings Fundamentals introduces the fundamental concepts that are required to read, understand, and interpret engineering drawings used throughout the manufacturing industry. This subject stimulates an interest in drafting and engineering as career options for students. The course would enhance the capabilities and skills of students and promote their development. The outcome that is expected to be developed is the ability to produce neatly organized, clean and accurate drawings according to specification, and basic knowledge: identify, recall and grasp the meaning of basic facts, concepts and principles in mechanical engineering.</p>			

Module 6

Code	Course/Module Title	ECTS	Semester
UOB103	Computer science/ 1	3.00	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
1	2	47	28
Description			
<p>سيتم في هذا الفصل الدراسي دراسة مقدمة عامة عن أساسيات الحاسوب واطوار دوره حياته وتطور اجياله وتصنيف الحواسيب حسب الغرض والحجم والاداء والنوعية ونظم التشغيل كذلك سيتم التعرف على مكونات الحاسوب وأجزائه المادية (اجهزة الادخال والاخراج وصندوق الحاسوب) والتعرف على الكيان البرمجي وانظمة الاعداد وعلى المميزات الرئيسية للحاسوب الشخصي ويتم عرض امان الحاسوب وتراخيص البرامج من خلال معرفة اخلاق العالم الالكتروني واشكال التجاوزات في العالم الرقمي وخصوصية الحاسوب وتراخيص برامج الحاسوب وانواعها وكذلك التعرف على الملكية الفكرية والاختراق الالكتروني وانواعه ومصادره والمخاطر الامنية الاكثر انتشارا وعرض البرمجيات الخبيثة واضرارها وصفاتها ومكوناتها وانواعها واهم الخطوات اللازمة للحماية من عمليات الاختراق، وكذلك يتم التعرف على انواع نظم التشغيل ووظائفها واهدافها وتصنيفها ومتطلبات تثبيته وتنصيبه ويتم ايضا التعرف على اهم مصطلحات الحاسوب والانترنت واهم اختصارات لوحة المفاتيح.</p>			

Module 7

Code	Course/Module Title	ECTS	Semester
UOB104	Human Rights & Democracy	2.00	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	32	17
Description			
<p>يتضمن هذا المنهج للإقسام العلمية غير الاختصاص بالتركيز على رفا الطلبة بمتطلبات الوعي والإدراك بحقوقهم الإنسانية كمواطنين عراقيين متساويين بالحقوق والالتزامات تجاه بعضهم البعض والتي نص عليها الدستور العراقي وتم مراعاة تلك النصوص للتوافق مع المعايير الدولية لحقوق الإنسان والتي نصت عليها ميثاق الأمم المتحدة واتفاقياتها الدولية .</p> <p>كما أن تدريس الطلبة لهذه المادة سيمنحهم القدرة على التفاعل بشكل سليم مع مختلف أطراف المجتمع مما يؤهلهم لتحقيق التعايش السلمي وتقبل الاختلافات المجتمعية بشكل واقعي، وعملية تحقيقه على أرض الواقع سيتم تنفيذها عبر الديمقراطية والياتها إذ لا يمكن أن ينجح المجتمع ونظامه السياسي بالوصول لأعلى مراتب التفكير والعمل الديمقراطي من دون أن يمتلك المجتمع معلومات وافرة عن حقوقه الإنسانية وما يترتب عليها من التزامات أخلاقية واجتماعية ووطنية، وهذه المادة ستمنح الطالب التفكير المنطقي السليم بمضامين حقوقه والوعي بكيفية توظيفها ايجابياً لتصبح جزء لا يتجزأ من مخرجات العملية الديمقراطية وبالنتيجة يتحول الجميع الى مشاركين فاعلين في تحمل المسؤولية العامة وبناء الدولة وضمان تحقيق استقرار المجتمع والحفاظ على أمنه وسلامته.</p> <p>ينقسم المنهج الى محورين أساسيين: الأول: محور حقوق الإنسان وكيف نشأت ومعرفة أشكالها والياتها وضماداتها على مختلف المستويات كما يتضمن حقوق الإنسان المعلوماتية وتأثيرها على وتقع حقوق الانسان، وأيضا مخاطر الإرهاب الدولي وانتهاكاته لحقوق الإنسان المحور الثاني: محور الديمقراطية وعبره يتعرف الطالب على الأصول الفكرية للديمقراطية وطبيعتها نشأتها وتطورها ومجالات عملها وأدواتها الرقابية على الحكومة ومزاياها الإيجابية والسلبية وكيفية قدرتها على تطوير واقع المجتمعات وبناء مستقبلها السياسي والاقتصادي والاجتماعي.</p>			

Module 8

Code	Course/Module Title	ECTS	Semester
CE102	Engineering Mechanics2	7.00	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	2	93	82
Description			
<p>Mohr's Circle for Moments of Inertia (basic concept, moment of inertia for an inclined axis, principal moments of inertia). Friction (nature of friction, laws of friction, angle of friction and types of problems involving frictional forces). Introduction to dynamics. Kinematics of particles, Rectilinear motion, Plane curvilinear motion. Space curvilinear motion. Relative motion. Constrained motion. Kinetics of a particle: force, mass, and acceleration, Newton's 2nd law – Equations of motion, Curvilinear motion. Work and energy, Kinetic energy, Potential energy, Linear springs. Impulse and momentum, Linear impulse and linear momentum, Angular impulse and angular momentum. Impact. General equation of motion, General plane motion.</p>			

Module 9

Code	Course/Module Title	ECTS	Semester
CE104	Building Material/2	4.00	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	37
Description			
<p>Blocks. Manufacture of blocks. Concrete blocks. Solid block. Itonic block. Silica blocks. Glass block. lime block. burned clay block. Hourdy blocks. Advantages of hourdy blocks. Disadvantages of hourdy blocks.</p> <p>Tiles. Main types of tiles according to their uses. roofing tiles, flooring tiles, wall tiles, Drain tiles, glazed earthenware tiles. characteristics of good tiles. Manufacture of tiles. Tile tests.</p> <p>Timber. Classification of trees. Classification of Timber. Characteristics of good timber Seasoning of timber. Defects in timber. Defects due to Abnormal Growth.</p> <p>Steel. Classification of metals. Nonferrous metals. Ferrous metals, Iron, Cast iron, Wrought iron, Low carbon steel – mild steel , High carbon steel . Effect of Impurities on Steel. Heat treatment. Steel reinforcing bars. Advantages of Steel Reinforcement. Disadvantages of Steel Reinforcement. Classification. Tensile testing of steel bars according to IS 1608</p> <p>Nanotechnology. Introduction. Nanomaterials used in construction. Applications of Nano technology. Applications in construction, In cement and concrete, Carbon Nanotubes, Coatings – Inorganic, Nonadditive Fire Retardants. Advantages of Nanotechnology, Manufacturing Advantages, Energy</p>			

Advantages, Medical Advantages, Environmental Effects, Engineering advantages. All materials were detected both theoretically and experimentally

Module 10

Code	Course/Module Title	ECTS	Semester
CE105	Engineering Geology	5.00	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
3	2	78	47
Description			
<p>Introduction to Geology, Geomechanics and Geotechnical Engineering, Engineering Geology, Earth, Definition and Factors, Minerals, Rocks, Formation and Types, Rock Cycle, Metamorphic Rocks, Sedimentary Rocks, Structural Geology, Physical and Mechanical Properties of Rocks are presented. The role of magma, the formation and identification of igneous rocks, metamorphic rocks, sedimentary rocks, structural geology, physical and mechanical properties of rocks are also discussed. The most important details in this text are the physical and mechanical properties of rocks, the weathering process, the formation of sediments, the formation and identification of metamorphic rocks, the engineering properties and classification of soils, the physical and mechanical properties of soils, the sources of internal and external forces subjected to earth, the geophysical investigation, and the seismic investigation.</p>			

Module 11

Code	Course/Module Title	ECTS	Semester
CE106	Engineering statistics	5.00	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	62
Description			
<p>As a wide-ranging discipline, statistics concerns numerous procedures for deriving information from data that have been affected by chance variations. On the basis of scientific experiments, one may record and make summaries of observations, quantify variations, or other changes of significance, and compare data sequences by means of some numbers or characteristics.</p> <p>At a more sophisticated level of analysis and interpretation, one can, for instance, test hypotheses using the inferential approach developed during the twentieth century. statistics can be a complementary and a valuable aid to technology. In prudent hands it can lead to the best practical assessment of what is partially known or uncertain.</p>			

Module 12

Code	Course/Module Title	ECTS	Semester
CE108	Mathematics 2	5.00	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	0	63	62
Description			
<p>This course introduces the basic concepts and techniques of integral calculus and matrix algebra and their applications to engineering problems. The course covers the following topics:</p> <ul style="list-style-type: none"> • Indefinite integral: how to find the integral of various functions using the rules of integration, such as sum, difference, constant multiple, power, exponential, logarithmic, trigonometric and inverse trigonometric rules. • Integral of transcendental and trigonometric functions: how to find the integral of functions involving transcendental and trigonometric functions, such as exponential, logarithmic, sine, cosine, tangent, cotangent, secant, cosecant functions. • Method of partial fraction: how to use the method of partial fraction to find the integral of rational functions involving fractions with polynomial expressions. • Area between curves: how to use definite integrals to find the area between two curves in a plane. • Volume a solid revolution: how to use definite integrals to find the volume of a solid obtained by revolving a region in a plane about an axis. • Matrix method: how to work with matrices and understand some fundamental concepts from matrix algebra, such as addition, multiplication, transpose, inverse, determinant and rank. 			

Module 13

Code	Course/Module Title	ECTS	Semester
UOB102	English Language 1	2.00	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	32	18
Description			
<p>The course covers grammar, vocabulary, writing, and speaking activities. The topics throughout the book deal with things like food, likes/dislikes, asking questions, life at home, travel, and several other basic level subjects; the layout of each unit is simple and easy to follow, but the book is heavy on text</p>			

and it may pour the students with valuable information.

In each lesson, the students will work on a variety of activities that will help them put all of their language skills to use. In every lesson, students will go over filling – in - the - blank grammar exercises, reading comprehension sections and partner activities or writing exercise to wrap up each lesson. 'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills. The students will take some time to express themselves by writing essays about their specialization in simple language after being acquainted with different scientific terms.

Module 14

Code	Course/Module Title	ECTS	Semester
UOB101	Arabic Language/1	2.00	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	32	18
Description			
<p>تضمن منهج اللغة العربية للأقسام غير الاختصاص مراجعة لما تعلمه الطالب في مرحلة المتوسطة والاعدادية مع تعزيز معلوماته ورفده بمعلومات جديدة تساعده على تنمية مهاراته في التعبير والكتابة بلغة عربية فصحة سليمة خالية من الأخطاء الإملائية والنحوية وتصحيح ما اعتاد عليه من أخطاء لغوية شائعة فضلاً عن تزويده بالشجاعة الأدبية التي تغني ملكة الإلقاء عنده في المحافل والمؤتمرات وينقسم المنهج الى ثلاثة محاور: الاول المحور النحوي واللغوي ويتضمن قواعد اللغة العربية وتطبيقاتها الاعرابية مع الأخطاء اللغوية الشائعة ، الثاني المحور الأدبي وفيه يتعرف الطالب على نماذج من الشعر القديم والحديث حفظاً وتحليلاً، المحور الثالث هو محور البلاغة القرآنية وفيه يتعرف الطالب على بلاغة الاسلوب القرآني من خلال اختيار سورة من سور القرآن حفظاً وفهماً ، أما مصادر الدرس فهي مصادر اللغة العربية المتنوعة بين المراجع والمصادر ، فضلاً عن وجود مؤلفات عدة تحت عنوان: منهج اللغة العربية لغير الاختصاص.</p>			

Module 15

Code	Course/Module Title	ECTS	Semester
CE201	Engineering Surveying /1	4.00	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	3	78	22
Description			
<p>Definitions and basic principles: What is surveying, surveying classifications, point locations, accuracy in surveying works, errors and mistakes, Distance measurements: Types of tapes, measurement systems, types of measurements, laser tapes, corrections for measurements. Leveling: Definitions, level instruments, level types, testing and mending level instruments, leveling procedures, booking methods, leveling calculation methods, uses of leveling, longitudinal sections, cross sections, and topographic maps.</p>			

Module 16

Code	Course/Module Title	ECTS	Semester
CE203	Fluid Mechanics/1	4.00	3

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	37
Description			
Fluid Mechanics I: Static fluid: Property of Fluids, Pressure and Its Measurement, Hydrostatic Forces on Submerged Surface, Buoyancy and Floatation, Pressure Variation in Accelerated Bodies of Fluid, Fluid Kinematics, Dimensional Analysis and Hydraulic Similitude			

Module 17

Code	Course/Module Title	ECTS	Semester
CE205	Mechanics of Materials1	6.00	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	87
Description			
Concept of Stress, A Short Review of the Methods of Statics, Axial Loading; Normal Stress, Riveted Connections, Shearing Stress, Bearing Stress in Connections, Application to the Analysis and Design of Simple Structures, Stress and Strain—Axial Loading, Normal Strain under Axial Loading Stress-Strain Diagram, Hooke's Law; Modulus of Elasticity, Elastic versus Plastic Behavior of a Material, Deformations of Members under Axial Loading, Statically Indeterminate Problems, Poisson's Ratio, Generalized Hooke's Law Shearing Strain, Thermal Strains, Thin-Walled Pressure Vessels.			

Module 18

Code	Course/Module Title	ECTS	Semester
CE208	Concrete Technology/1	4.00	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	37
Description			
Cement: General, Manufacture of Portland cement, Chemical composition, Hydration of cement, Optimum gypsum content. Types of cement: Ordinary Portland cement, Rapid hardening cement, Sulfate resistance cement, Low heat cement, Portland slag cement, Portland pozzolana cement, White cement, and Colored Portland cement, Physical and chemical requirements in Iraqi standards for each type of cement. Aggregate: General, Classification, gradation according to Iraqi standard, bond Strength, Alkali aggregate reaction, Sulfate in aggregate. All above with theoretical and experimental.			

Module 19

Code	Course/Module Title	ECTS	Semester
CE210	Mathematics3	5.00	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	0	63	62
Description			
<p>The course introduce the Polar coordinates Systems, Area in Polar coordinates, Lengths of Curves, Matrices, System of Liner equations, Grammar rule, Inverse of matrices and solve the system by using the inverse, the Eigenvalues, Vectors in two and three dimensions and Line in space, planes, The velocity and acceleration, the curvature, TNB –system, Functions of several Variables, Limits and continuity, Partial derivatives, Differentials, Chain rule, Directional derivatives, Tangent planes and normal lines to surfaces, Extrema of functions ,Lagrange multipliers.</p>			

Module 20

Code	Course/Module Title	ECTS	Semester
UOB204	Baath Regime Crimes in Iraq	2.00	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	32	18
Description			
<p>إن الجرائم الشنيعة التي اقترفتها نظامُ البعث في العراق لا تكاد تُحصى كثرةً، ولو أنّ أرقامَ الباحثين تعقَّبَتْها سنواتٌ طويلةٌ بالتوثيق والتحليل والدراسة لما أتتْ على حقيقة ما جرى في بلدنا الجريح من مآسٍ وويلاتٍ ونكباتٍ قام بها نظامُ البعث الجائر؛ لأنها اتسعتْ لتشملَ مفاصلَ الحياة كلّها، فطالَتِ الحجزَ والمدَرَ والبشر، وستبقى هذه الجرائمُ وصمةً عارٍ وعلامةً خزي في جبين مرتكبيها ما بقي الدهر، تلاحقُهم دماءُ الأبرياء، وآلامُ الضحايا، ولعنةُ الأهوار التي حرموها من مائها على مريض، وانكسار الجبال التي جردوها من شموخها بقسوة، وأنين النخيل والبساتين، حين أطفأ خضرَتها الهجيزُ، وتقصُّ مضاجعهم دموعُ الأرامل والأيتام، وصرخاتُ المعذبين، وأطياف الأطفال الذين ماتوا جوعاً في ربوع بلد الرافدين حتى تشخص جرائمهم هذه دليل ادانة في موقف محكمة العدل الإلهية يوم القيامة عندما تظهر كتبهم كل صغيرة وكبيرة منها تسوقهم إلى جهنم زمراً.</p>			

Module 21

Code	Course/Module Title	ECTS	Semester
UOB203	Computer Science/ II	3.00	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)

1	2	47	28
Description			
Introduction to Excel, Formulas, Charts, Sorting, Filters, Introduction to MATLAB, Variables and workspace, Operators, expressions, and statements, Repeating with FOR, Decision, Plotting functions, Derivatives and Integration, Solving simultaneous equations and polynomials. (The course includes laboratory works).			

Module 22

Code	Course/Module Title	ECTS	Semester
UOB201	Arabic Language/2	2.00	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	32	18
Description			
تضمن منهج اللغة العربية للأقسام غير الاختصاص مراجعة لما تعلمه الطالب في مرحلة المتوسطة والاعدادية مع تعزيز معلوماته ورفعته بمعلومات جديدة تساعده على تنمية مهاراته في التعبير والكتابة بلغة عربية فصحة سليمة خالية من الأخطاء الإملائية والنحوية وتصحيح ما اعتاد عليه من أخطاء لغوية شائعة فضلاً عن تزويده بالشجاعة الأدبية التي تغني ملكة الإلقاء عنده في المحافل والمؤتمرات وينقسم المنهج الى ثلاثة محاور : الاول المحور النحوي واللغوي ويتضمن قواعد اللغة العربية وتطبيقاتها الاعرابية مع الأغلط اللغوية الشائعة ، الثاني المحور الأدبي وفيه يتعرف الطالب على نماذج من الشعر القديم والحديث حفظاً وتحليلاً، المحور الثالث هو محور البلاغة القرآنية وفيه يتعرف الطالب على بلاغة الاسلوب القرآني من خلال اختيار سورة من سور القرآن حفظاً وفهماً ، أما مصادر الدرس فهي مصادر اللغة العربية المتنوعة بين المراجع والمصادر ، فضلاً عن وجود مؤلفات عدة تحت عنوان :منهج اللغة العربية لغير الاختصاص.			

Module 23

Code	Course/Module Title	ECTS	Semester
CE202	Engineering Surveying /2	4.00	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	3	78	22
Description			
Areas of irregular shapes, methods of calculating areas and volumes, Trapezoidal method, Simpson rule, cross sections, coordinates method, planimeter Volumes: volumes by sections, volumes by elevations, volumes by contour lines Theodolite and traverse surveying, Theodolites, horizontal and vertical angles, Total station measurements, Traversing: kinds of traverses, Azimuth. Bearing, GCPs, accuracy setting out works: Setting out elevations, setting out Horizontal and vertical curves Introduction to GIS and Remote sensing			

Module 24

Code	Course/Module Title	ECTS	Semester
CE204	Fluid Mechanics/2	5.00	4

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	62
Description			
Fluid Mechanics II: Dynamic Fluid; Bernoulli, S And Momentum Equation, Application of Bernoulli, S Equation, Flow of Real Fluid, Fluid Flow in Pipes, Minor Head Losses, Open Channel Flow, Non-Uniform Flow Through Open Channel Flow-Specific Energy, Hydraulic Jump and Weirs, Pipe Network Design			

Module 25

Code	Course/Module Title	ECTS	Semester
CE206	Mechanics of Materials2	6.00	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	87
Description			
Torsion, Deformations in a Circular Shaft , Stresses in the Elastic Range, Angle of Twist in the Elastic Range Statically Indeterminate Shafts, Design of Transmission Shafts, Torsion of Noncircular Members, Thin-Walled Hollow Shafts, Bending, Shear and Bending-Moment Diagrams , Relations among Load, Shear, and Bending Moment, Symmetric Member in Pure Bending , Deformations in a Symmetric Member in Pure Bending , Stresses and Deformations in the Elastic Range, Bending of Members Made of Several Materials, Unsymmetrical Bending , Design of Prismatic Beams for Bending			

Module 26

Code	Course/Module Title	ECTS	Semester
CE209	Concrete Technology/2	4.00	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	37
Description			
Properties of concrete, workability at the site, and strength requirements are the most important ideas that must be known by civil engineers which include: Fresh properties of concrete, Workability – factors affecting workability, Measurement of workability, Segregation, Bleeding Strength of concrete: General, factors affecting strength of concrete, Gain of strength with age, Bond strength. Elasticity, creep, and shrinkage and the Special type of concrete. All above with theoretical and experimental.			

Module 27

Code	Course/Module Title	ECTS	Semester
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CE207	Building Construction	4.00	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	3	78	22
Description			
<p>The purpose of the building Construction course is to provide the most basic information needed by the student in the faculty of Engineering on the subject of building construction and preparation to absorb a lot of information that has to do with his future studies and practice the profession after that. Also, we review the methods used locally in construction and compared them with modern methods abroad. Also, we review the scientific and applied aspects related to the establishment.</p> <p>The semester indicates the Types of Buildings, earthwork, Footing and Foundations, Piles and Piling Concrete Works, Brick and Block work, Masonry Works, Forms and Scaffoldings, Beams, Girders and Columns, Floors and Roofs, Arches, Lintels and Sills, Damp Proofing, Finishing of Walls and Ceilings, Doors and Windows, Means of Moving Between Levels, Stairs, Joints in Buildings, Fire Places and Chimneys.</p>			

Module 28

Code	Course/Module Title	ECTS	Semester
CE211	Mathematics 4	5.00	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	0	63	62
Description			
<p>The course introduces Double integrals, Areas and Volumes, Double integrals in polar coordinates, Triple integrals, Applications of Triple integrals, Triple integrals in Cylindrical and Spherical coordinates, Infinite sequences, Convergent or Divergent, Infinite series, Positive Term series, Alternating series, Absolute Convergence, Power series, Taylor and Maclaurin series, Binomial series, Separable and first-order linear differential equations, Exact differential equations, Homogenous differential equations, Second-order linear differential equations, Nonhomogeneous linear differential equations.</p>			

Module 29

Code	Course/Module Title	ECTS	Semester
UOB202	English Language 2	2.00	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	32	18
Description			

The New Headway pre-intermediate is still one of the most preferred course books by many language learning academies all around the world. Part of the reason is that it is regarded as one of the easiest adaptable course books to diverse socio-cultural contexts. Effective speaking means bringing together a range of different skills to communicate and make an impact. At the very least, the speaker need to find the right words, put them in the proper order, and pronounce them correctly so that the speakers can be understood.

When the students simply memorizing the words and repeating them is not enough to give a compelling performance and connect with an audience. They should use them in context orally. The students will take some time to express themselves by writing essays about their specialization in simple language after being acquainted with different scientific terms.

Module 30

Code	Course/Module Title	ECTS	Semester
CE301	Structural Analysis/ I	5.00	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	62

Description

Introduction (preview on the sign convention of forces, equilibrium system of equations, types of loads, types of supports). Stability and determinacy of structures (check the stability and degree of indeterminacy of beams, frames, trusses, multi- store buildings and composite structures). Axial force, Shear force and bending moment diagram of frames and arches. Trusses (definition, common types and analysis of a simple and combined trusses). Influence lines and moving loads (drawing the IL for beams, girder-floor beam-stringer system and trusses and evaluating the maximum response due to moving load). Elastic deformation of structures (evaluating the elastic deformations using unite load method, least work method and conjugate beam method).

Module 31

Code	Course/Module Title	ECTS	Semester
CE303	Soil Mechanics1	6.00	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	3	78	72

Description

This course introduces soil mechanics to the students, and familiarizes students with relevant terms and soil tests so that they can work effectively with geotechnical engineering specialists who focus on a historical perspective on the origin and formation of soil, types of soils, physical properties of soil,

weight-volume relations, classification of soil by unified soil classification system USCS and AASHTO system, soil compaction, the permeability of the soil, seepage in soil, The principles of water flow in soils (Flow in 1-D and 2-D) and solving continuity equation, overburden pressure of soil, stresses in soil mass resulting from the applications of different types of external loads. (The course includes laboratory tests).

Module 32

Code	Course/Module Title	ECTS	Semester
CE305	Reinforced Concrete Design1	5.00	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
3	1	63	62
Description			
Introduction to reinforced concrete, Loads, Load factors and combinations, Strength, Methods of design. Flexural analysis and design of beams, Flexural strength, Flexural analysis of singly R.C beam, rectangular section, T- section, Other types of beam's section, doubly reinforced section, Reinforcement details. Shear and Diagonal Tension in Beams, Shear strength, Shear reinforcement. Analysis and Design for Torsion, Torsion strength, Torsion reinforcement.			

Module 33

Code	Course/Module Title	ECTS	Semester
CE308	Water Recourses& Hydrology	7.00	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	3	108	67
Description			
Water Recourses: Water resources is including water use and water excess management. It includes the design of an open canal used for the irrigation process also the design of a drainage system (open and closed). Hydraulic design of irrigation system, Design of lined canals by different methods, Design of unlined canals by different methods, Types of lining, Groundwater movement, Permeability of soil, Flow in a confined and unconfined aquifer, Analogy between the flow of groundwater and electricity, Water infiltration into the soil – basic infiltration rate, Hydraulic design of drainage system, Hydraulic design of open drains, Hydraulic design of closed drains, Hydraulic design of pipe drains, Drainage wells – Steady state wells, Artesian wells, Interference of wells –superposition method, Salt problems			

in soil and water, Evolution of irrigation water, Water quality, Water sampling, Water pollution index, Method for controlling water quality, Introduction to dams types.

Hydrology: This course introduces the hydrologic cycle and hydrology applications for engineering. Hydraulic Cycle, Weather, Hydrology, Precipitation, Evaporation, Groundwater, Wells, Discharge Determination, Flood Waves, RUNOFF, Hydrograph, Reservoirs, Wind, and hydroelectric power plants.

Module 34

Code	Course/Module Title	ECTS	Semester
CE310	Eng. Management and Economy	4:00	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	0	63	37
Description			
<p>Introduction to Science of Economy, Economies for Organization, Costs, Incomes, Slope and Elasticity of Economical Function, Interest and Interest's Rules, Depreciation, Alternatives, Economical Studies, Using of Statistical Methods in Engineering Economy.</p> <p>Engineering Management. Definition, Management Duties during Construction of Project, Requirements of Successful Project Planning, Project Planning Methods (Bar-Chart, Net-Work Analysis, and Grid Methods) Crash Program Updating the Plan, Resources Allocation.</p>			

Module 35

Code	Course/Module Title	ECTS	Semester
CE311	Computer Application/1	2.00	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
0	2	33	17
Description			
<p>The course helps students to model, analyze, and design simple RC and steel structures using</p>			

Autodesk **Revit** and **Robot** Software Programs by using Robot software:

- To deal with statics problems including computing reactions, resultant of forces, internal forces diagrams, and internal forces in trusses.
- To deal with deformation aspects such as the deflection of beams, frames, and trusses.
- To revisit load determination according to ASCE-7, including the gravity loads, seismic loads, and wind-induced pressures.
- To overview the steel and RC design capabilities of Robot

Module 36

Code	Course/Module Title	ECTS	Semester
CE314	Workshop	1.00	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
1	0	17	8
Description			
<p>The definition of carpentry, the tools, and tools used in the process, the cutting of timber, electrical devices, filings, manual planers, sawing, lathing, welding, joining metals, joining metals by screws, rivets, plumbing and mortar, welding, types of welding, joining metals by screws, rivets, plumbing and mortar, welding, and methods of preparing acetylene gas are the most important details in this text. Welding is the most common method of combining metals using screws, rivets, pipe and mortar, welding, and acetylene gas preparation procedures. Welding is the most common method of combining metals using screws, rivets, pipe and mortar, welding, and acetylene gas preparation procedures.</p>			

Module 37

Code	Course/Module Title	ECTS	Semester
CE302	Structural Analysis/ II	5.00	6

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	62
Description			
<p>Method of consistence deformation (evaluating the reactions of indeterminate beams, frames trusses and composite structures). Method of least Work (analyze the indeterminate beams, frames trusses and composite structures). Slope deflection method (determining the deformations and reactions of indeterminate beams and frames). Moment distribution method (determining the reactions of indeterminate beams and frames). Approximate analysis of indeterminate structures. Stiffness matrix analysis of structures.</p>			

Module 38

Code	Course/Module Title	ECTS	Semester
CE304	Soil Mechanics2	6.00	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	3	78	72
Description			
<p>The course introduces soil mechanics to the students; and teaches the students how to solve certain fundamental problems related to consolidation, settlement, and shear strength. The course features soil stresses (Normal and shear stress on a plane. The pole method of finding stress along a plane stress caused by a point load, line load, strip load, and rectangularly loaded area), Soil compression, consolidation (One-dimensional Terzaghi theory of consolidation), and shear strength of soil (Mohr-coulomb failure criteria) as required in geotechnical design. The stress path for drained and undrained shearing of soil, Consolidation problems, and foundation settlement prediction (Immediate settlement, consolidation settlement, and secondary compression) will also be covered. (The course includes laboratory tests).</p>			

Module 39

Code	Course/Module Title	ECTS	Semester
CE306	Reinforced Concrete Design2	5.00	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
3	1	63	62

Description
Continuous beams analysis and design, ACI Code coefficients. Design of one-way slabs. Bond. Anchorage and development length, Hooks, Lap splices. Serviceability and deflection in beams. Cracks in concrete, Control of cracking. Design of reinforced concrete columns, Column strength, axially loaded columns, Member in compression and bending, Critical column load combination, Biaxial moments, Reinforcement details.

Module 40

Code	Course/Module Title	ECTS	Semester
CE307	Engineering Analysis & Numerical methods	5.00	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	1	78	47
Description			
<p>Engineering Analysis: Application of 1st Order Differential Equations (Outflow of water through a hole (Torricelli's Law), Mixing Problem (Salt Amount in Connected Tanks), Newton's Law of Cooling). Application of 2nd Order Differential Equations (Vibration (Mass-Spring System), Deflection of Determinate Beam, Buckling). Application of Higher Order Differential Equations (Deflection of Indeterminate Beam). Simultaneous Differential Equations. Application of Simultaneous Differential Equations (Vibration of Multi Story Building- Mass-Spring System, Amount of Salt in Cycle Connected Tanks). Fourier series. Application of Fourier series (Deflection of Simply Supported Beam).</p> <p>Numerical methods: Introduction. Approximation and errors. Solution of Nonlinear Equation - Roots of Equations (Bisection Method, Newton Method, and Fixed-Point Method). System of Linear Equation (Gauss Elimination Method, and Solution by Iteration –Jacobi's Method and Gauss Seidel Method). Curve Fitting – Interpolation (Lagrange's Interpolating Polynomial, and Newton's Divided Difference Interpolating Polynomial). Curve Fitting – Least squares Regression. Numerical Integration (Newton Cotes Integration Formula- Rules Method, and Gaussian Integration – Gaussian Quadrature). Numerical Solution of Ordinary Differential Equation (Taylor's Expansion Method, and Euler's Method) Finite Difference Method for Boundary Value Problems</p>			

Module 41

Code	Course/Module Title	ECTS	Semester
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CE309	Traffic Engineering	5.00	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	4	93	32
Description			
Describe the basic traffic stream models and compute the basic traffic stream parameters. The use of software for the operational condition evaluation within two lanes or multi lanes highways. Evaluate the operation of existing signal timings. Also design and optimizing the signal timing of signalized intersection. The use of manual as well as software for the operational condition analysis within two lanes. The use of manual as well as software for the operational condition analysis within multilane highway. The use of manual as well as software for the operational condition analysis within urban streets. Traffic data collection and data analysis using Minitab software.			

Module42

Code	Course/Module Title	ECTS	Semester
CE312	Computer Application/2	2.00	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
0	2	33	17
Description			
The course helps students to develop problem-solving skills and an understanding of project management principles through the application of computer techniques. To understand the importance of using computer programs such as Ms. Project & Primavera with project management.			

Module43

Code	Course/Module Title	ECTS	Semester
UOB301	English Language3	2.00	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	32	18

Description
<p>Focusing on grammar and its mistakes, the students will be able to indulge in conversation about language usage, participate in debates, as well as new words, family expressions, word origins and histories, etymology, grammar, books, literature, writers and writing, and more. English is the most widely spoken language in the world, making the students communicate with people from different countries and cultures easily. Authentic material from a variety of sources enables students to see new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills as: Listening and speaking then reading and writing. The students will be able to use scientific terms in context and express their knowledge about their specialization accurately and confidently and write essays concerning their specialization. Then, they have enough knowledge to understand native speakers clearly.</p>

Module 44

Code	Course/Module Title	ECTS	Semester
CE401	Structural Design1	10.00	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
6	4	153	97
Description			
<p>Design of Concrete Structures: The summary course of the First term of reinforced concrete design II is an outline of types of reinforced concrete two-way slabs according to ACI code which provides Minimum slab thickness in addition to two methods for two-way slab design: direct design method and equivalent frame method.</p> <p>Design of Steel Structures: Introduction, Tension Member, Compression Member, Design of Trusses, Flexural Members, Plate Girders, Box Girders, Members Under Biaxial Bending, Connections (Riveted, Bolted, and welded).</p> <p>Design of Bridges: This course introduces the Design of Reinforced Concrete One-Way Slab Deck Bridges, the Design of Reinforced Concrete Girder- Deck Bridges, and the Design of Composite Concrete Slab – Steel Girder Bridges.</p>			

Module 45

Code	Course/Module Title	ECTS	Semester
CE403	Foundation Engineering1	5.00	7

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	62
Description			
<p>The objective of a basic design course should be to develop in the engineering student the ability to analyze a given problem in a simple and logical manner and to apply to its solution a few fundamental and well-understood principles. This approach makes it possible to develop all the necessary formulas in a rational and logical manner, and to clearly indicate the conditions under which they can be safely applied to the analysis and design of actual engineering structures and machine components.</p> <p>The main objectives if this course is to emphasis on the geotechnical parameters that affects the design and analysis of foundations and retaining walls.</p>			

Module 46

Code	Course/Module Title	ECTS	Semester
CE405	Transportation Engineering/1	5.00	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	62
Description			
<p>The primary objective of this module is to provide civil engineers with a comprehensive understanding of geometric design in transportation engineering. Geometric design plays a pivotal role in shaping the physical attributes of roadways, and this module aims to equip engineers with the essential knowledge and skills needed to excel in this domain. This ability is achieved by obtaining potential in highway planning, traffic system analysis, geometric design, and earthwork quantities calculation. This course intended to deliver the information by a theoretical demonstration as well as an applicable practice in the lab by conducting a geometric design for a selected route.</p>			

Module 47

Code	Course/Module Title	ECTS	Semester
CE407	Sanitary and Environmental Engineering1	5.00	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	62

Description
This course introduces water consumption, forecasting population, fire demand, water quality, water treatment /Intake and screens/ sedimentation by gravity/ sedimentation by chemicals/filtration/ disinfection/hardness removal. Type of distribution systems, flow in pipes, design methods, Hardy Cross & Equivalent pipe method in analyzing distribution systems.

Module 48

Code	Course/Module Title	ECTS	Semester
CE409	Construction Methods	3.00	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	33	42
Description			
The course introduces the Construction Process, Project Realization, Construction Process Parties, Project management, Role of Engineer and Contract, Planning Techniques (Networks, Line of Balance), Resource Allocation, Types of Equipment, Plant Management, Earthworks, Concrete Industry, Precast Construction,			

Module 49

Code	Course/Module Title	ECTS	Semester
CE411	Engineering Project1	2.00	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	30	20
Description			
An engineering project is a program or model implemented by one or more students as a simulation of a real project in the labor market similar to the student's field of study.			

Module50

Code	Course/Module Title	ECTS	Semester
CE402	Structural Design2	8.00	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
4	4	123	77

Description
<p>Design of Concrete Structures: The summary course of the Second term of reinforced concrete design II is an outline of punching shear and moment transfer according to the ACI code; of yield line theory and how it's used with two-way reinforced concrete; Prestressed concrete with The ACI code, which has rules for how to design these concrete</p> <p>Design of Steel Structures: This course introduces a description of the most convenient structural steel sections that are used in steel construction. Five basic topics of steel structures will be studied: Bending and Axial Force (Beam-Columns), Cover-Plated Beams and Built-Up Girders (Plate Girders), Building Connections, Eccentrically Loaded Bolted and Welded Connections, and Design of Steel Buildings</p> <p>Design of Tanks: This course introduces Types and definition for R.C. Tanks, the Design of Reinforced Concrete Circular Tanks, the Design of Reinforced Concrete Rectangular Tanks using PCA ,</p>

Module 51

Code	Course/Module Title	ECTS	Semester
CE404	Foundation Engineering2	5.00	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	62
Description			
<p>The objective of a basic design course should be to develop in the engineering student the ability to analyze a given problem in a simple and logical manner and to apply to its solution a few fundamental and well-understood principles for the design and analysis of foundations. This approach makes it possible to develop all the necessary formulas in a rational and logical manner, and to clearly indicate the conditions under which they can be safely applied to the analysis and design of actual engineering structures and machine components. The main objectives if this course is to emphasis on the structural design of foundations</p>			

Module 52

Code	Course/Module Title	ECTS	Semester
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CE406	Transportation Engineering/2	5.00	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	62
Description			
<p>This module is tailored to prepare civil engineers for the unique challenges and complexities of highway paving projects. It places a strong emphasis on the critical aspects of paving materials and design procedures. The goal is to provide engineers with the expertise required to work with various paving materials, understand asphalt mix design, and master the structural design of both flexible and rigid pavements. This course intended to deliver the information through a theoretical demonstration as well as an applicable practice in the lab by conducting several tests and preparing assignment reports.</p>			

Module 53

Code	Course/Module Title	ECTS	Semester
CE408	Sanitary and Environmental Engineering2	5.00	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	2	63	62
Description			
<p>This course introduces wastewater, physical, chemical and biological properties, aerobic and anaerobic decomposition of organic matter, BOD equation, quantity of wastewater, application of the rational formula, sewer system, corrosion in the sewer system, sewer system appurtenance, pumping stations, designing procedure using Manning formula, wastewater disposal, Streeter Philip equation, wastewater treatment/ screens/flotation tanks/girt chambers/primary sedimentation tanks/biological treatment/ trickling filters and activated sludge process/ secondary sedimentation tanks/ sludge treatment.</p>			

Module 54

Code	Course/Module Title	ECTS	Semester
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CE410	Quantity Surveying	3.00	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	33	42
Description			
Quantity surveying is a short review of the type of measurement, methods of estimates, and bill of quantity preparation. The course introduces Approximate Estimation, Detailed estimation, Pricing, Technical Specifications, Term Project, Concrete Forms, Contract Documents.			

Module 55

Code	Course/Module Title	ECTS	Semester
CE412	Engineering Project2	2.00	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	30	20
Description			
An engineering project is a program or model implemented by one or more students as a simulation of a real project in the labor market similar to the student's field of study.			

Module 56

Code	Course/Module Title	ECTS	Semester
UOB401	English Language4	2	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
2	0	32	18
Description			
The benefits of learning English are both personally and professionally. English is a widely spoken language in the world, making it an essential and international language. It allows and opens up opportunities to travel and work in different countries. Additionally, learning English is important in multinational companies require employees to have a good level of English proficiency. It also allows the speakers to access a wealth of information and resources that are only available in English, such as academic journals, and online content. Furthermore, learning English has been proven to improve cognitive function and memory. The students will be able to use scientific terms in context and express their knowledge about their specialization accurately and confidently and write essays concerning their specialization. Moreover, they can speak fluently and understand native speakers			

effectively. The four skills: listening, speaking then reading and writing in this stage is mature.

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