Ministry of Higher Education and Scientific Research
University of Technology
Building and Construction Engineering Department
Undergraduate Study Syllabus 2015/2016
First Year - Second Semester
First Year

Subject		Hrs./week			Units
		Theo.	Tut.	Lab.	
B.E.1204	Engineering Mechanics (2)	3	1		3
B.E.1202	Mathematics (2)	3	1		3
B.E.1212	Building Materials Technology (2)	2		1	3
B.E.1208	Engineering Drawing (2)	1		3	2
B.E.1210	Engineering Geology (2)	1	1		1
B.E. 1213	Civil Eng. Fundamental	2			2
B.E. 1205	Chemistry	1	1	1	2
B.E. 1103	Human Rights	1	1		1
B.E.1107	English Language	2			2
B.E.1105	Workshops (2)	1		3	2
Total		17	5	8	21
		30			

Subject		Hrs./week			Units
		Theo.	Tut.	Lab.	
B.E.1204	الميكانيك الهندسي (٢)	3	1		3
B.E.1202	رياضيات (٢)	3	1		3
B.E.1212	تكنولوجيا مواد البناء (٢)	2		1	3
B.E.1208	الرسم الهندسي (٢)	1		3	2
B.E.1210	الجيولوجيا الهندسية (٢)	1	1		1
B.E. 1213	مبادئ الهندسة المدنية	2			2
B.E. 1205	كيمياء	1	1	1	2
B.E. 1103	حقوق الانسان	1	1		1
B.E.1107	اللغة الانكليزية	2			2
B.E.1105	معامل (٢)	1		3	2
Total		17	5	8	21
		30			

B.E. 1202 Mathematics II	**Theory: 3hrs./ Week** **Tutorial: 1hr./ Week**
1- Methods of integration: powers of trigonometric functions, integrals involving $\sqrt{a^2-x^2}, \sqrt{a^2+x^2}, \sqrt{x^2-a^2}$, integrals with ax^2+bx+c, partial fraction, integration by parts, the substitution u= tan x/2, further substitution, improper integral.	24
2- Application of definite integrals (areas, volumes, length of the curve and surface areas).	12
3- Vectors: definitions and representations, vector components and the unit vector.	16
4-Conic sections: (parabola, ellipse and hyperbola)	4
5- Polar coordinates: graphs and plane area.	4

B.E. 1204 Engineering Mechanics 2	**Theory: 3hrs./ Week** **Tutorial: 1hr./ Week**
1- First and second moments of inertia: Centroid, center of gravity and center of pressure, theorems or propositions of Pappus, second moments of inertia, products of inertia of areas, polar moment of inertia, transfer of coordinates.	20
Dynamics: 2- Kinematics-absolute motion: Rectilinear motion, angular motion and absolute motion of particles using linear and polar coordinates, absolute motion of a particle on a curve in one plane using normal and tangential components.	15
3- Kinetics, force, mass, acceleration, Newton's law of motion, equations of motion of a particle (translation and rotation), reversed effective forces and couples.	15
4- Introduction to work and energy.	10

B.E. 1205 Chemistry	**Theory: 1hr./ Week** **Tutorial: 1hr./ Week** **Practical: 1hr./ Week**
1-Atomic structure	3
2-Chemical Bonds Ionic bonds, covalent bonds, metallic bonds, hydrogen bonds and Van deer Waals bonds	9
3-Dalton atomic concept	3
4-The mole concept Measuring moles of atoms and measuring moles of compounds	6
5-Concentration of solutions Percent by mass, Molarity, mass of solute	٣
6-Periodic table Metal, non-metal	٦
7-Some properties of elements Ionic and molecular compounds, oxidation reduction and number	١٥

B.E. 1208 Engineering Drawing (2)	**Theory: 1hr./ Week** **Practical: 3hr./ Week**
1- Ortho graphic-drawing, projections.	20
2- Dimensions.	4
3- Isometric drawing.	8
4- Sections.	4
5- Drawing of plans for civil engineering applications.	8
6- Descriptive geometry.	16

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B.E. 1210 Engineering Geology (2)	**Theory: 1hr./ Week** **Tutorial: 1hr./ Week**
1- Physical and engineering properties of rocks: - Physical properties of rocks (density, porosity, void ratio, dry and saturated unit weight), multimineral rocks. Mathematical examples and applications. - Mechanical properties: Rock deformation, elastic moduli, mechanical properties of rocks (compressive, tensile, and shear strength), earth stresses. Mathematical examples and applications.	4
2- Surface water and river geologic work: Water movement, discharge and other hydraulic parameters with their mathematical determination, river geologic work (erosion, transportation and deposition), types of river deposits. Mathematical examples and applications.	4
3- Ground water: Sources, permeability and porosity, effects of rock types, vertical distribution of ground water, types of aquifers, (confined and unconfined), Darcy's law, case study for unconfined aquifers, ground water movement effect of geological structures on ground water, springs and their types, hydrogeology of Iraq. Mathematical examples and applications.	4
4- Site investigations and Geophysical Exploration: Fundamental concepts, stages of site investigations. Geophysical methods (electric, seismic, Ground Penetrating Radar (GPR), electromagnetic, gravity, magnetic) with their applications and uses in civil engineering. Mathematical examples and applications.	5
5- Geological problems related to civil engineering: Soil creep, landslides, rock avalanches, erosion, deposition, their causes and effects, effect of ground water, applications and engineering solutions.	5
6- Effects of geological structures on structural projects: joints, folds, and faults, applications.	4
12- Other phenomena: Volcanoes and earthquakes, their effects and predictions.	4

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B.E. 1212 Building Materials Technology 2	**Theory: 2hr./ Week** **Practical: 1hr./ Week**
1- Metal: Classification, composition, properties, uses, standard tests and specifications.	8
2- Bricks: Classification, manufacture, properties of brick, durability, standard tests and specifications, other types of brick	8
3- Bonding materials: Classification, chemical composition, manufacture, properties and uses of common bonding materials, standard tests and specifications.	6
4- Timber: Classification, properties, seasoning, types of defects, standard tests.	8
5-Plastics: properties and classifications, methods of manufacturing, moldings, plastic binders, fields of application of plastics.	4
Laboratory Tests	
1- Bonding materials- Gypsum: Fineness, standard consistency, setting time, soundness, compressive strength, mechanical resistance, static bending.	10
2- Timber: Static bending, compression parallel and perpendicular to the fiber, tensile test, shear test.	5

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B.E. 1213 Civil Eng. Fundamental	**Theory: 1hr./ Week** **Tutorial: 1hr./ Week**
A) Principles of Construction management 1- General introduction to construction management. 2- Basic elements of management 3- Planning of engineering projects.	5
B) Principles of Environmental Engineering 1- Man, environment and the epidemiology. 2- Water pollution and the kind of polluters and the diseases that transport through water. 3- The characteristics of drinking water according to WHO standards. 4- The ways of the treatment of the drinking water. 5- The ways of the treatment of the raw water.	5
C) Principles of Structural Engineering 1. Types of structural elements. 2. Types and properties of external loading 3. Types of internal forces and the resulting stresses. 4. Structural systems. 5. Steel frames	5
D) Principles of Highway and Bridge Engineering 1. General introduction to highways and bridges. 2. Classifications of highways and bridges. 3. Types of pavement.	5
E) Principles of Hydrology and Water Resources 1- Introduction, water budget, water cycle. 2- Sources of water and uses. 3- Dams, types and elements 4- Hydraulic structures, types and uses 5- Ground water	5
F) Principles of Geomatics Engineering 1. Introduction to Geomatics. 2. Land surveying 3. Geodesy & GNSS 4. Photogrammetry 5. Remote sensing & GIS	5

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B.E. 1103 Human Rights	**Theory: 1hr./ Week** **Tutorial: 1hr./ Week**
١-مفهوم الحق و الانسان	٢
٢-حقوق الانسان في الحضارات القديمة (اليونانية و المصرية و العراقية)	٢
٣- حقوق الانسان في الاديان السماوية (المسيحية و اليهودية)	٢
٤-حقوق الانسان في الاسلام	٢
٥-المصادر القانونية لحقوق الانسان (في انكلترا و الولايات المتحدة الامريكية و فرنسا)	٢
٦-الحقوق السياسية	٢
٧-الحقوق الاقتصادية	٤
٨-نشاط لاصفي (تقارير الطلبة)	٢
٩-الحقوق الاجتماعية و الثقافية	٢
١٠-الحريات الفردية	٢
١١-المصادر القانونية الدولية لحقوق الانسان (القانون الدولي)	٢
١٢-المنظمات الدولية المعنية بحقوق الانسان	٢
١٣-الحماية القضائية لحقوق الانسان	٤

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B.E. 1107 English Language	**Theory: 1hr./ Week** **Tutorial: 1hr./ Week**
Unit One 1-Speaking: Introducing yourself. 2-Grammer: Possessive adjectives my, your, his and her; the verb "be ": affirmative statements and contraction. 3-Pronunciation: Linked sounds.	2
Unit Two 1-Speaking: Naming objects; asking for and giving the locations of objects. 2-Grammer: Articles a, an and the; this/these, it/they; plurals; yes/no and where questions with be. 3-prepositions of place: in, in front of, behind, on, next to and under. 4- Pronunciation: plural –s endings	2
Unit Three 1-Speaking: Talking about cities and countries. 2-Grammer: The verb be: affirmative and negative statements. 3-Grammer: The verb be: yes/no, questions, short answers and Why- questions. 4-Pronunciation: Syllable stress	2
Unit Four 1-Speaking: Asking about and describing clothing and colors; talking about the weather and seasons. 2-Grammer: Possessive: adjectives our and their, pronouns, names, and whose; present continuous statements and yes/no, questions. 3-Grammer: Conjunctions "and" and "but"; placement of adjectives before nouns. 4-Pronunciation: The letters s and sh	2
Unit Five 1-Speaking: Asking for and telling time. 2-Grammer: Time expressions: o'clock, A.M., P.M., noon, midnight, in the morning/ afternoon/ evening, at 7:00/ night/ midnight. 3-Grammer: Present continuous Wh-questions, conjunction *so*. 4-Pronunciation: Rising and failing intonation.	2
Unit Six 1-Speaking: Asking for and giving information about how people go to work or school 2-Grammer: Simple present statements with regular and irregular verbs. 3- Grammer: Simple present yes/no and Wh-questions; time expressions: early, late, every day, on Sundays/weekends/ weekdays. 4- Pronunciation: Third-person singular-s endings.	2
Unit Seven 1-Speaking: Asking about and describing houses and apartments. 2-Grammer: Simple present short answers. 3-Gramer: there is, there are; there's no, there isn't a, there are no, thee aren't any. 4- Pronunciation: Words with "th".	2
Unit eight 1-Speaking: Asking for and giving information about work. 2-Grammer: Simple present Wh-questions with do and does; placement of adjective after be and before nouns. 3- Pronunciation: Reduction of do and does. 4-Writing: Describing Facts and Figures (Bar charts)	2

B.E. 1107 English Language	**Theory: 1hr./ Week** **Tutorial: 1hr./ Week**
Unit Nine 1-Speaking: Talking about food likes and dislikes. 2-Grammer: Some and any; count and nonpoint nouns; specific and general nouns; adverbs of frequency: always, usually, often, sometimes, hardly ever, never. 3-Pronunciation: Sentence stress. 4- Writing: Describing Facts and Figures (Pie charts)	2
Unit Ten 1-Speaking: Asking for and giving information about abilities and talents. 2-Grammer: Simple present Wh-questions; can for ability; yes/no and Wh-questions with "can" 3- Pronunciation: Pronunciation of can and can't. 4- Writing: Describing Facts and Figures (Tables)	2
Unit Eleven 1-Speaking: Talking about plans for the evening, weekend, and other occasions. 2-Grammer: The future with be going to. 3-Grammer: yes/no and Wh- questions with be going to; future time expressions. 4-Pronunciation: Reduction of going to.	2
Unit Twelve 1-Speaking: Describing health problems. 2-Grammer: Have + noun. 3-Grammer: feel + adjective; negative and positive adjectives; imperatives. 4-Pronunciation: Sentence intonation.	2
Unit Thirteen 1-Speaking: Talking about stores and other places; asking for and giving directions. 2-Grammer: Prepositions of place: on,on the corner of, across from, next to, between. 3-Grammer: giving directions with imperatives. 4-Pronunciation: Compound nouns.	2
Unit Fourteen 1-Speaking: Asking for and giving information about weekend and vacation activities 2-Grammer: Simple past statements with regular and irregular verbs. 3- Grammer: Simple past yes/no questions and short answers. 4- Pronunciation: Simple past-ed endings..	2
Unit Fifteen 1-Speaking: Asking for and giving information about date and place of birth. 2-Grammer: Statements and questions with past of be. 3-Gramer: Wh-questions with did, was and were. 4- Pronunciation: Negative contractions. **Unit Sixteen** 1-Speaking: Describing people's locations. 2-Grammer: Propositional phrases; subject and object pronouns; invitations with Do you want to….? And Would you like to…?; verb +to. 3- Pronunciation: Reduction of want to and have to.	2

B.E. 1105 Workshops	**Theory: 1hr./ Week** **Practical: 3 hrs./ Week**

The workshop training program is designed to satisfy the following objectives:

- Teaching safety rules and regulations on-site in an industrial environment.
- Proper use of working tools, instruments, and machines.
- Introducing basic workshop practices, production, labor, and time-requirements of workshop operations.

The students are introduced to training programs in six workshops: fitting, turning and milling, carpentry, plumbing, auto-mechanics, and casting.

The student is to spend 12 hours of training in every workshop.