Al-Furat Al –Awsat Technical University-
جامعة الفرات الأوسط التقنية

Bachelor of Science Honours (B.Sc. Honours) –
Building & Construction engineering
Technologies بكالوريوس علوم – هندسةتقنيات البناء والأنشاءات

Table of Contents

1. Overview

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

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة تقنيات البناء والأنشاءات للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (43) 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

1-

Code	Course/Module Title	ECTS	Semester
ATU22011	Engineering mechanics1	8	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
4	2	93	107
Description			
After successful completion of this course the student will be able to understand: 1-the manner of dealing with forces acting on bodies. 2-the relation between the force and its components. 3- the principle of moments & couples. 4- Another purpose was to help the student to develop the logical , orderly processes of thinking which characterizes the engineer .			

2

Code	Course/Module Title	ECTS	Semester
ATU22012	Engineering drawing1	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	4	93	57
Description			
Introducing the fundamentals of engineering drawing to the student so that he can be qualified to express his thoughts, draw & execute the projects related to civil engineering; As well as aims to: 1- Assisting requester in experimenting and creating their design ideas in the two-dimensional environment of architectural drawing and design programs with the help of a computer. 2-Take advantage of the technologies provided by AutoCAD to complete many graphic operations quickly and with greater accuracy and present them in a professional manner. 3-Teaching the requester how to use the devices associated with the regular drawing programs, and training students to import and export drawings to other compatible programs and how to integrate them with other information for engineering projects.			

3

Code	Course/Module Title	ECTS	Semester
ATU22013	Mathematics	8	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
3	2	78	122
Description			
1/Develop the ability of student in using mathematics in engineering applications 2/After successful completion of this course the student will be able to understand: a/ Matrices. b/ Applications of indefinite integration and finite integration. c/ Application of derivatives in mechanics. d/ Trigonometric functions. e/ Logarithmic and exponential functions. f/ Integration. g/ Limits. h/ Slope of the straight line , Slope of the curve.			

4-

Code	Course/Module Title	ECTS	Semester
ATU22014	Human rights & democracy	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	0	33	17
Description			
الهدف من المادة زيادة معرفة الطالب بالجانب المفاهيمي النظري والتطور التاريخي لمادة حقوق الانسان والديمقراطيةمن خلال قدرته على ان 1- يفهم معنى حقوق الانسان وأشكالها 2- يعرف المواثيق والعهود الدولية لحقوق الانسان 3- يعرف مفهوم الحريات وتصنيفها 4- اهم مبادئ وتطبيقات نظم الديمقراطية			

5-

Code	Course/Module Title	ECTS	Semester
ATU22015	**English Language SKILL**	**2**	**1**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2		**33**	**17**
Description			
After successful completion of this course, the student will be able to understand: Present continuous, comparative and superlative adjective, vocabulary. Time clauses, this and that, vocabulary and comprehension. If clauses, vocabulary and comprehension. This and that, expletive there, prepositions. Past perfect, past perfect continuous , vocabulary and comprehension. Relative pronouns, relative clauses. Past perfect, Past perfect continuous, vocabulary and recension. Used to, Infinitives, passive voice. Passive voice, coordinating conjunctions, subordinating conjunction. Future perfect, future perfect continuous, vocabulary and comprehension. Writing a composition, comprehension			

6-

Code	Course/Module Title	ECTS	Semester
ATU22016	**Arabic language**	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2		33	**17**

Description

1- تعميق معرفة الطالب بقواعد اللغة والاملاء التي تعلمها سابقا؛ ليتحاشى الوقوع في الأخطاء الغوية والاملائية، وليسهل عليه كتابة التقارير وجميع الأعمال الكتابية بصورة صحيحة نحويا ولغويا.

2- توسيع نطاق الوعي اللغوي والأدبي ليشمل جميع الطلبة والمجتمع المحلي من خلال المحاضرات والندوات والدورات التدريبية المختلفة، والأخذ بيد المبدعين من اصحاب المواهب

7-

Code	Course/Module Title	ECTS	Semester
ATU22017	Workshops	**2**	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
	2	33	**17**

Description

Upon completion of the course, students should be able to:

1. Clear statements of the skills, knowledge, and attitudes that participants will develop as a result of participating in your workshop.
2. Understand various manufacturing processes in machine shop and perform basic operations of welding, fitting, smithy and carpentry work
3. a) perform basic operations of welding, fitting, smithy and carpentry work b) Explain various manufacturing processes in machine shop
4. Discuss application of plumbing fitting, masonry items and about plastic molding and glass cutting for various engineering application
5. Measure different electrical quantities and trouble shoot electrical and electronics appliances.
6. Conduct experiments with various kits such as Raspberry and Arduino for embedded system development

8-

Code	Course/Module Title	ECTS	Semester
ATU22021	Engineering Mechanics 2	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
3	2	78	72
Description			
After successful completion of this course the student will be able to understand: 1. the fundamentals of engineering mechanics (Static's &Dynamics) in the engineering applications, the loads analysis, resultants, 2. equilibrium in 2-D and 3-D, moments and couples. 3. first and second moment of inertia, motion of particles, and their theories. 4. Equipment and machinery design.			

9-

Code	Course/Module Title	ECTS	Semester
ATU22022	Construction material	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
4	4	123	77
Description			
After successful completion of this course the student will be able to understand: 1. Student informing with the properties of materials such as brick 2. Student informing with physical, chemical properties and specification of building materials such as metals , plastic 3. Student learning how to test the materials such as metals , bricks Student training to doing materials tests such as timber.compression members.			

10-

Code	Course/Module Title	ECTS	Semester
ATU22023	Plane Surveying	8	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
4	6	109	116

Description

A graduate of this major should be able to:

1. General basics of surveying,foundemetals of surveying, units of measurements, plotting scale .
2. Explain the difference between plane and geodetic surveying .
3. Linear measurements ,mean for measuring distances ,direct method of horizontal distance measurements .
4. Explain the principles of Electronic distance measurements.
5. Errors in surveying , types of errors ,Accuracy and precision, Principles of errors scattering theory**.**
6. Obstacles to measuring.
7. Leveling. Types of leveling , Leveling instrumentation , Leveling by taping, Trigonometric leveling , Sources of errors in leveling (vertical, horizontal).
8. Skills of using Level Instrument efficiently
9. The students should be able to make a levelling Survey and calculate the results relative to some chosen datum.
10. The students should be able to make a levelling survey along a predetermined line set out on the ground. Process the data and draw longitudinal sections and cross sections from the results.
11. The students should be able to select the most appropriate method of measuring horizontal and vertical angles.
12. Vertical sections , Longitudinal sections ,Calculation of cut and fill.
13. The students should be able to compute the quantities of cut and fill in any kind of sections for Roads
14. Contour lines: Method of drawing and construction.
15. Areas and volumes: Volume computation from cross-section , Volume from topographic maps and grid net , Volume computation from contour maps.

11-

Code	Course/Module Title	ECTS	Semester
ATU22024	**Engineering Geology**	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2		33	**42**
Description			
1- The study aims to know the earth's crust and its mineral and physical properties. **2. Classification of sedimentary and metamorphic rock species.** **3. Stabilization of rocky slopes and their impact on buildings.** **4. The effect of weathering on structures and the factors affecting them.** **5. Soil formation factors and their engineering properties** **6- Geological structure of the characteristics of rock strata** **7- The study aims to know surface and groundwater and its impact on the work site** **8- Dams, tunnels and loads above them**.			

12-

Code	Course/Module Title	ECTS	Semester
ATU22025	**Engineering physics**	4	**2**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	2	63	37
Description			

13-

Code	Course/Module Title	ECTS	Semester
ATU22026	Principle of Computer	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	1	48	**27**

Description

After successful completion of this course the student will be able to understand:

1. **The student's knowledge of all hardware parts of the computer.**
2. **Know the operation of each part of the computer**.
3. **Knowing the icons on the desktop and executing commands on them**.
4. **Access to all computer contents**.
5. **Work on paint program**.
6. **Knowledge of Microsoft Word and making reports and research using it.**
7. **Knowledge of Excel and making tables with it**.
8. **How to access the Internet, and how to create an email**.

14-

Code	Course/Module Title	ECTS	Semester
ATU22031	**Concrete Technology 1**	**6**	**3**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	**2**	**63**	**87**

Description

After successful completion of this course the student will be able to understand:

1. **Student informing with the cement compounds and their effects on its properties.**
2. **Student informing with some types of cement and a description on each of them.**
3. **Student informing with the properties of aggregate and their effects on concrete.**
4. **Student informing with the properties of fresh concrete.**
5. **Student training to doing cement and aggregate tests.**
6. **Student training to doing fresh concrete tests.**

15

Code	Course/Module Title	ECTS	Semester
ATU22032	**Strength of Materials 1**	**6**	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
4	**2**	63	**37**

Description and compute

After successful completion of this course the student will be able to understand:
the relations between externally applied loads and their internal effects on bodies (Strains, Deformations , and Stresses).
1- The student will be able to define the different types of stresses
2- The student will be able to define and compute the different types of strains
3- The student will be able to draw the shear force and bending moment diagrams to any beam
4- The student will be able The student will be able to compute bending stresses and shear stresses in beams
5- The student will be able to compute beams deflection
6- The student will be able to define and compute buckling of columns

16-

Code	Course/Module Title	ECTS	Semester
ATU22033	**Fluid mechanics1**	**5**	**3**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	**2**	**63**	**62**

Description

After successful completion of this course, the student will be able to understand:
1-Develop the fundamental principles underlying the subject.
2.Knowledge of fluid properties and terminology of this subject.
3. Knowledge of fluid mechanics tests.
4. Knowledge of fluid flow kinematics.
5. Knowledge of fluid flow types and how to distinguish between them in the lab.
6- Demonstrate the design of the pipe network.

7- Knowledge of dimensional analysis.

16

Code	Course/Module Title	ECTS	Semester
ATU22034	Engineering surveying	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
4	2	63	87
Description			

upon completion of this course the students will:

1. **To apply the knowledge of horizontal and vertical curves.**
2. **Types Horizontal curves , Kinds (simple ,compound reverse and transition curve), Computations**
3. **Vertical Curves , Kinds , Computations**
4. **Tunnel surveying .**
5. **Setting out of horizontal curves**
6. **Skills of using Total Station Instrument efficiently**
7. **Setting out constructions, small &large building .**
8. **Arial photogrammetric surveying**
9. **Photogrammetric traditional surveying**
10. **Photogrammetric Instruments &Flight design**
11. **Global Positioning System (GPS)**

Geographic Information system (GIS)

17-

Code	Course/Module Title	ECTS	Semester
ATU22035	Probability & Statistics	4	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	1	63	37

Description
After successful completion of this course, the student will be able to understand: **1-To be familiar with the probability, statistics, and linear programming ideas that are used in engineering applications** **2-To investigate the faults in any engineering products To examine the quality of the project-related components that were purchased to research optimization methods for various issues to research the issues with transportation.**

18-

Code	Course/Module Title	ECTS	Semester
ATU22036	**Advanced mathematics**	**6**	**3**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	**2**	**63**	**87**
Description			
After successful completion of this course the student will be able to understand: **1. the behavior the multiple integration using rectangular, cylindrical and spherical coordinates.** **2. Analysis series to develop the student's mental abilities and benefit from their applications in the field of specialization.** **3. complex numbers** **4. vector calculus: vector functions.** **5. Matrix** **6. Partial derivatives** **7. Greens and Stokes theorems.** **8. Sequences, convergence test and Taylor series, power series.**			

19-

Code	Course/Module Title	ECTS	Semester
ATU22041	**Strength of Materials 2**	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	**2**	63	**87**

Description

After successful completion of this course the student will be able to understand:

1. Solve engineering problems relating to stress and strain analysis.
2. Develop the student's ability to deal with normal force, shear force and bending moment in statically determinate beam assemblies with internal hinges.
3. An ability to calculate stresses and deformations of object under external forces
4. An ability to analyze a given problem in a simple manner.
5. An ability to apply the knowledge of strength of material on engineering application and design problems.
6. An ability to communicate effectively
7. Understanding the impact of engineering solutions on global and societal context
8. Using the techniques, skills, and modern tools necessary for engineering practice
9. Designing concepts and applications in engineering mechanics of material .
10. Critical Thinking
11. Analytical methods in solving problems

20-

Code	Course/Module Title	ECTS	Semester
ATU22042	**Fluid Mechanics 2**	**4**	**4**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	**2**	**63**	**37**

Description

After successful completion of this course, the student will be able to understand:

1. To understand the science of fluid in rest and motion
2. To understand the types and methods of pressure measurement
3. To understand the behaviors of forces on submerged gates
4. To determine the behavior of fluid in rigid body movement
5. To understand flow of ideal fluid
6. To derive the continuity equation
7. To derive the energy equation for real fluid
8. To classified the type of the flow in

21-

Code	Course/Module Title	ECTS	Semester
ATU22043	Building Construction	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
4	0	48	37
Description			
In this subject the student will learn: 1. soil investigation and soil bearing capacity. 2. Foundation types. 3. Building of walls by many masonry types (brick, stone, block, ...). 4. Forms types and scaffoldings. 5. Beams and columns. 6. Roofs and floor constructions. 7. Thermal and acoustical isolations. 8. Damp proofing. 9. finishing works.			

22-

Code	Course/Module Title	ECTS	Semester
ATU22044	Applied Survey 2	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	2	63	87
Description			
upon completion of this course the students will: 1- To apply the knowledge of horizontal and vertical curves. 2- Types Horizontal curves , Kinds (simple ,compound reverse and transition curve), Computations 3- Vertical Curves , Kinds , Computations 4- Tunnel surveying . 5- Setting out of horizontal curves 6- Skills of using Total Station Instrument efficiently 7- Setting out constructions, small &large building . 8- Arial photogrammetric surveying 9- Photogrammetric traditional surveying 10- Photogrammetric Instruments &Flight design			

23

Code	Course/Module Title	ECTS	Semester
ATU22045	**Technology of Construction materials industry**	**4**	**4**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	**2**	**63**	**37**

Description

After successful completion of this course the student will be able to understand:

1. Using a computer operating system.
2. Using computer software to solve mathematical problems.
3. Using Microsoft office to write reports, Tables, graphical diagrams and other works.
4. Ability to write basic computer codes (Programming).

24

Code	Course/Module Title	ECTS	Semester
ATU22046	**CONCRETE TECHNOLOGY 2**	**4**	**4**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	**2**	**63**	**37**

Description

After successful completion of this course the student will be able to understand:

1. Using a computer operating system.
2. Using computer software to solve mathematical problems.
3. Using Microsoft office to write reports, Tables, graphical diagrams and other works.
4. Ability to write basic computer codes (Programming).

25

Code	Course/Module Title	ECTS	Semester
ATU22046	جرائم حزب البعث البائد	**2**	**4**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2		**33**	**17**

Description

1- انتهاكات الحقوق والحريات
2- اثار القمع الفكري والنفسي
3- اثر القمع والحروب على الانسان
4- اثر القمع والحروب على البيئة

26

Code	Course/Module Title	ECTS	Semester
ATU22048	**Computer Applications2**	3	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USSWL (hr/sem)**
2	1	48	**77**

Description

After successful completion of this course the student will be able to understand:

5. Using a computer operating system.
6. Using computer software to solve mathematical problems.
7. Using Microsoft office to write reports, Tables, graphical diagrams and other works.
8. Ability to write basic computer codes (Programming).