

**Al-Farahidi University**  
**جامعة الفراهيدي**



*First Cycle – Bachelor's Degree (B.Tech.) – Aeronautical Technical Engineering*

بكالوريوس - هندسة تقنيات الطيران



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### 1. Overview

This catalogue is about the courses (modules) given by the program of Aeronautical Technical Engineering to gain the Bachelor of Technical 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.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة تقنيات الطيران للحصول على درجة بكالوريوس تقنيات. يقدم البرنامج (48) مادة دراسية، على سبيل المثال، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

### 2. Undergraduate Courses 2023-2024

#### Module 1

Code	Course/Module Title	ECTS	Semester
AFU12011	English for Academic U.	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	0	18	32
Description			
The aim of this course is to equip students with English terminology and expressions used in scientific and technical fields and to enable them to use this language efficiently in the workplace.			

#### Module 2

Code	Course/Module Title	ECTS	Semester
AFU12012	Computer Principals	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	2	48	52
Description			
The goal of this course is to teach students the core practical and theoretical skills required for designing, coding, and understanding computer programs. Basic programming concepts and methods will be introduced to enable students working with abstract notions to solve computational problems. The course does not aim for teaching a particular programming language. The language will be only used for demonstrating the related computer science concepts and methods.			

**Module 3**

Code	Course/Module Title	ECTS	Semester
AFU12013	single variable calculus	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	62
Description			
The main objective of the course is to make the students form a mathematical background by instructing required information about relation, limit, continuity, derivative, integral and to gain the ability of rational approach to the problems at a daily life for students.			

**Module 4**

Code	Course/Module Title	ECTS	Semester
AFU12014	Workshop	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	4	63	62
Description			
This section includes a description of the module, 100-150 words			

**Module 5**

Code	Course/Module Title	ECTS	Semester
AFU12015	physics	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	78	72
Description			
To act responsibly - Introduced To think independently - Introduced To develop continuously - Introduced To communicate effectively - Introduced			

**Module 6**

Code	Course/Module Title	ECTS	Semester
AFU12016	CAD Drawing	8	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
	8	115	85
Description			
The course will lay the foundation for civil engineers' use of technical drawings by providing instruction in drawing understanding and using computerized drawing programs.			

### Module 7

Code	Course/Module Title	ECTS	Semester
AFU12021	Human Right and Democracy	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	0	18	32
Description			
The lecture deals with the basic principles underlying human rights: normative universalism, human dignity, the inalienability of certain rights, the relationship between freedom and equality, claims of social inclusion, the secular nature of modern law, the sometimes tense interplay between human rights and democracy			

### Module 8

Code	Course/Module Title	ECTS	Semester
AFU12022	Multi-variables calculus	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	62
Description			
The aim of this course is to construct a basis of information which student will use in future by giving detailed information about integral, applications of integral and series, and to have students being learned analytical thought. The aim of this course is functions of several variables are to provide the basic concepts and methods.			

### Module 9

Code	Course/Module Title	ECTS	Semester
AFU12023	Engineering Materials	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	42
Description			
This module presents the key underlying science and mathematical tools to predict material performance in-service to enable engineers to have an objective set of tools to make rational decisions on materials selection. The module covers materials ranging from light alloys (i.e., aluminium alloys and titanium alloys) to steels (carbon, stainless, and advanced high strength steels). The course centres on the physical metallurgy of such engineering alloys to demonstrate the effect of alloying and its implications for the processing, microstructure and performance of structural pipeline steels, large scale forgings and aerospace components in both airframe and aero-engine applications. Some parallels will also be drawn with the automotive industry, when discussing both steels and light alloys.			

### Module 10

Code	Course/Module Title	ECTS	Semester
AFU12024	Fundamentals of Thermodynamics	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72

Description
Concepts and definitions; the thermodynamic system, properties, phase equilibrium of pure substances, equations of state for gases, tables of thermodynamic properties, work and heat. First law of thermodynamics; thermodynamic cycles, change of state, internal energy, enthalpy, specific heat; open systems, steady-state and transient processes. Second law of thermodynamics; reversible and irreversible processes, the Carnot cycle, the thermodynamic temperature scale, entropy, the entropy production concept. Thermodynamic power cycles, refrigeration cycles, the Otto cycle and the Diesel cycle, the gas-turbine process. Introduction to exergy analysis.

### Module 11

Code	Course/Module Title	ECTS	Semester
AFU12025	Engineering Mechanics-Static	8	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
5	3	123	77
Description			
Mechanics is the study of forces that act on bodies and the resultant motion that those bodies experience. With roots in physics and mathematics, Engineering Mechanics (including mechanics of solids and mechanics of fluids) is the basis of all mechanical sciences including but not limited to Civil Engineering, Materials Science and Metallurgical Engineering, Mechanical Engineering, Aeronautical and Aerospace Engineering, Petroleum Engineering, Geological Engineering, Mining Engineering, Chemical Engineering and Environmental Engineering.			

### Module 12

Code	Course/Module Title	ECTS	Semester
AFU12026	Fundamentals of Electricity	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
The overview of development and current trends in electrical engineering and computer science. Fundamentals of electricity, capacitance. Electric current and electrical phenomena. Fundamentals of magnetism, inductance and mutual inductance. Concepts, elements and topology of electric circuits. Kirchhoff's laws. Elementary DC circuits. Circuits with capacitors. Complex DC circuits (bridge circuit, star-delta transformation, circuits with multiple sources). Superposition, Thevenin's, Norton's and Millman's theorem. Current and voltage waveforms. Complex calculus in analysis of AC circuits. RLC circuits			

**Module 13**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12031	Fluid Mechanics -static	5	3
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	63	62
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 14**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12032	Fundemantls of Electronics	5	3
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	63	62
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 15**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12033	Theory of flight	8	3
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
5	2	108	92
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 16**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12034	Thermodynamic - ideal Gas	4	3
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	63	37
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 17**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12035	Manufacturing Processes	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
This section includes a description of the module, 100-150 words			

**Module 18**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12036	Fundamentals of Engineering Mechanics-Dynamics	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
This section includes a description of the module, 100-150 words			

**Module 19**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12041	Fluid Mechanics-Dynamics	3	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	27
Description			
This section includes a description of the module, 100-150 words			

**Module 20**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12042	CAE Principals	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	3	63	62
Description			
This section includes a description of the module, 100-150 words			

**Module 21**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12043	Engineering Mechanics-Applied of Dynamics	4	4
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	52
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 22**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12044	Strength of Materials	8	4
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
4	3	108	92
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 23**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12045	Programing python	6	4
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
1	4	78	72
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 24**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12046	Thermodynamic - Steam	4	4
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	63	37
<b>Description</b>			
This section includes a description of the module, 100-150 words			



**Module25**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12051	Aerodynamic -Fundamentals	4	5
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	52
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 26**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12052	Digital Techniques & Electronic instrument system	7	5
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
4	3	108	67
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 27**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12053	Eng. & Numerical Analyses	8	5
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
6	1	108	92
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 28**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12054	Gas Dynamics	4	5
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	63	37
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 29**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12055	Aircraft Engines	4	5
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	63	37
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 30**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12056	Industrial Engineering	3	5
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	0	33	42
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 31**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12061	Aerodynamic -Applied	4	6
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	52
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 32**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12062	Mechanical Eng. Design	8	6
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
5	2	108	92
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 33**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU120613	Heat Transfer	6	6
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
4	2	93	57
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 34**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12064	Gas Turbine Engines	4	6
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	63	37
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 35**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12065	Gas Dynamics-Applied	4	6
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	2	63	37
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 36**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12066	Theory of Machines	4	6
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	52
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 37**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12071	Aircraft Structure- fundemantals	3	7
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	27
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 38**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12072	Aircraft Vibration	8	7
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
5	2	108	92
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 39**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12073	mechanical Aircraft system & Maintanance	4	7
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	52
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 40**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12074	Aeronautical legislation & Human Factors	2	7
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	0	33	17
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 41**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12075	Automatic Control	8	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
5	2	108	92
Description			
This section includes a description of the module, 100-150 words			

**Module 42**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12076	CAM ( computer Aided manufacturing)	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	4	63	62
Description			
This section includes a description of the module, 100-150 words			

**Module 43**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12081	Aircraft Design	8	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
5	2	108	92
Description			
This section includes a description of the module, 100-150 words			

**Module 44**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12082	Propulsion Systems	7	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
5	2	93	82
Description			
This section includes a description of the module, 100-150 words			

**Module 45**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12083	Aircraft Stability	6	8
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
3	2	78	72
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 46**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12084	Aircraft Structure- Applied	3	8
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	27
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 47**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12085	Elec./Aircraft system & Maintenance	4	8
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
2	1	48	52
<b>Description</b>			
This section includes a description of the module, 100-150 words			

**Module 48**

<b>Code</b>	<b>Course/Module Title</b>	<b>ECTS</b>	<b>Semester</b>
AFU12086	Final Project	2	8
<b>Class (hr/w)</b>	<b>Lect/Lab./Prac./Tutor</b>	<b>SSWL (hr/sem)</b>	<b>USWL (hr/w)</b>
0	2	33	17
<b>Description</b>			
This section includes a description of the module, 100-150 words			

## Contact

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