

UNIVERSITY of BAGHDAD

جامعة بغداد



First Cycle – Bachelor's degree (B.Sc.) – Aeronautical Engineering
بكالوريوس علوم - هندسة طيران



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1. **Mission & Vision Statement**

Vision Statement

The Aeronautical Engineering Department AED endeavors to be a scientific and research center of excellence that leads the process of innovation in the field of aeronautical engineering and its applications, and achieves the quality of engineering education in its field of specialization

Mission Statement

M1- Graduation of engineering cadres with a leading integrated personality and professional skills and ethics that meet the needs of the civil and military institutions related to the field of specialization.

M2- Conduct research and studies, transfer knowledge and localize technology in order to serve and develop society.

M3- Provide the scientific environment that helps the attainment of creativity and innovation and care of the outstanding and talented students and invest their energies, and enhance the skills of continuous learning, and provide the community with professional services in the framework of specialization.

M4- To provide educational, academic and professional guidance, and to consolidate the national identity and spirit of belonging and loyalty to the country.

2. Program Specification

Programme code:	BSc-AE	ECTS	300
Duration:	5 levels, 10 Semesters	Method of Attendance:	Full Time

The aeronautical engineering program aims to graduate engineering cadres with a high level of scientific and professional skills in the field of aeronautical engineering, who work in various sectors of aviation, including civil, military, agricultural and other airports. The focus is on aviation science and conceptual design of aircraft in terms of aerodynamics, propulsion and control, in addition to preparing a graduation project. It includes building drones with different uses and application in the country's airports. The technical staff of the department has a leading and qualified personality and provides comprehensive scientific services to students and contributes to the planning and implementation of engineering projects and the search for ways to solve problems and work in a team spirit. The department provides a suitable work environment for students and faculty members for the purpose of quality graduates.

Levels 1 & 2 introduced students to the fundamentals of aeronautical sciences and are suitable for progression into all programs within the Engineering suite. Core subjects specific to the program are covered at level to prepare for the specialized research-led units at levels 3, 4 and 5. The Aeronautical Engineering graduate is thus trained to appreciate how research can inform teaching, according to the university and school's mission statements.

At Levels 3 , 4 and 5 allows students to develop their own wide-ranging interests in aeronautical engineering.

Department of Aeronautical Engineering was established in the year 2017 for five-year undergraduate program with total student intake of 26. A range of complementary elective courses also exists in the schemes. The students are rigorously trained and evaluated on a continuous basis in order to transform them into world class Aeronautical Engineering. The academic program schemes have also been designed in tune with the requirements of the industry. The Department has well equipped laboratories to compliment the theoretical courses taught at graduate and post graduate level and to handle research in areas of Aeronautical science.

3. Program Objectives

1- Providing students with basic knowledge in scientific and engineering fields, improving their professional abilities towards analytical and creative thinking, developing their potential in practical experience, experimental methods, using computer techniques, writing technical reports, communication skills, and communication with others and instilling the spirit of work through one team.

2- Continuous and renewable development of curricula according to international standards to ensure quality and keep pace with rapid and successive changes in all fields, and achieve the principle of sustainability and preservation of the environment.

3- Graduate well qualified engineers to implement the development and reconstruction plans of the country.

4- Graduation of engineers with the ability to use modern engineering tools to optimize the analysis and design of different systems in aeronautical engineering.

5- Graduation of engineering cadres capable of achieving success in the work environment using personal skills that include team work, communication skills, continuous learning, positive interaction with society, and commitment to social and ethics responsibilities, belonging and loyalty to the country.

6- Focusing on systematic scientific research and its primary role in serving the society and solving its problems and encouraging faculty members and students to take this aspect into account while directing and supporting the possibilities and providing the necessary requirements to achieve this.

7- Cooperation and exchange of experiences with universities, research centers and similar engineering education institutions inside and outside the country through partnership agreements for this purpose.

8- Develop and improve the capabilities of the teaching staff and attract the good faculty staff to the department.

9- Develop and improve the capabilities of administrative and technical staff and attract the good staff to the department.

4. Student Learning Outcomes

Aeronautical engineering is the study of the aerodynamics, jet propulsion and automatic controls for airplanes. Graduates obtain information on the basic knowledge in the aeronautical science. The Department offers a Bachelor of Science in Aeronautical engineering with a concentration in General aviation. Additionally. The Aeronautical engineering curriculum and experiences are designed to prepare students, in part, for entry into professional aviation programs, graduate studies, technical careers and education

Outcome 1

Identification of Complex Relationships

Graduates will be able to illustrate the structure and function of cellular components and explain how they interact in a living cell.

Outcome 2

Oral and Written Communication

Graduates will be able to formally communicate the results of biological investigations using both oral and written communication skills.

Outcome 3

Laboratory and Field Studies

Graduates will be able to perform laboratory experiments and field studies, by using scientific equipment and computer technology while observing appropriate safety protocols.

Outcome 4

Scientific Knowledge

Graduates will be able to demonstrate a balanced concept of how scientific knowledge develops, including the historical development of foundational theories and laws and the nature of science.

Outcome 5

Data Analyses

Graduates will be able to demonstrate scientific quantitative skills, such as the ability to conduct simple data analyses.

Outcome 6

Critical Thinking

Graduates will be able to use critical-thinking and problem-solving skills to develop a research project and/or paper.

5. Academic Staff

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6. Credits, Grading and GPA

Credits

(Name) University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 5-year B.Sc. degree:

$$\text{CGPA} = [(1^{\text{st}} \text{ module score} \times \text{ECTS}) + (2^{\text{nd}} \text{ module score} \times \text{ECTS}) + \dots] / 300$$

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
		hr/sem	hr/sem			
AE111	Calculus / I	63	62	5.00	B	
AE112	Engineering Mechanics-Statics	79	121	8.00	B	
AE113	Engineering Drawing	79	96	7.00	B	
AE114	Programming/I	63	87	6.00	B	
GEO03	English Language/I	32	18	2.00	B	
GEO01	Arabic Language	32	18	2.00	S	
		333	417	30.00		

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
		hr/sem	hr/sem			
AE121	Calculus / II	63	62	5.00	B	AE111
AE122	Engineering Mechanics-Dynamics	79	121	8.00	B	AE112
AE123	Engineering Drawing and Solid Modeling	79	46	5.00	B	AE113
AE124	Introduction to Aeronautical Science	64	36	4.00	C	
AE125	Basic Electrical Engineering	79	46	5.00	B	
AE126	Workshope Technology	49	26	3.00	B	
		399	351	30.00		

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
		hr/sem	hr/sem			
AE211	Mathematics/I	48	77	5.00	B	AE121
AE212	Fluid Mechanics/I	80	70	6.00	C	AE122,AE121
AE213	Thermodynamics/I	80	70	6.00	C	AE121
AE214	Mechanics of Materials	80	70	6.00	C	AE112
AE215	Programing /II	63	62	5.00	B	
GEO02	Democracy and Human Rights	32	18	2.00	B	
		399	351	30.00		

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
		hr/sem	hr/sem			
AE221	Mathematics/II	48	77	5.00	B	AE211
AE222	Fluid Mechanics/II	80	70	6.00	C	AE212
AE223	Thermodynamics/II	80	70	6.00	C	AE213
AE224	Mechanics of Machines	80	70	6.00	C	AE214
AE225	Engineering Metallurgy	79	46	5.00	C	AE125
GEO4	English Language/II	32	18	2.00	B	
		384	366	30.00		

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
		hr/sem	hr/sem			
AE311	Engineering Analysis	48	77	5.00	B	AE221
AE312	Aerodynamics/I	80	45	5.00	C	AE212
AE313	Heat Transfer/I	79	46	5.00	C	AE223
AE314	Aircraft Structures/I	79	46	5.00	C	AE214
AE315	Theory of Vibration	79	46	5.00	C	
AE316	Basic Electronics and Computer Interface	64	61	5.00	C	AE114
		444	306	30.00		

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
		hr/sem	hr/sem			
AE321	Applied Numerical Methods	48	77	5.00	B	AE311
AE322	Aerodynamics/II	79	46	5.00	C	AE312
AE323	Heat Transfer/II	80	45	5.00	C	AE313
AE324	Aircraft Structures/II	79	46	5.00	C	AE314
AE325	Avionics/I	78	47	5.00	C	AE225
AE326	Manufacturing Processes	64	61	5.00	B	AE215
		428	322	30.00		

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
		hr/sem	hr/sem			
AE411	Design of Machine Elements/I	65	60	5.00	B	AE224
AE412	Automatic Control	80	70	6.00	C	AE315
AE413	Aircraft Propulsion/I	80	70	6.00	C	AE223
AE414	Airconditioning	80	45	5.00	C	AE323
AE415	Avionics/II	65	35	4.00	C	AE325
AE416	Aircraft Performance	49	51	4.00	C	AE322
		419	331	30.00		

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
		hr/sem	hr/sem			
AE421	Design of Machine Elements/II	65	60	5.00	B	AE411
AE422	Flight Dynamics	65	85	6.00	C	AE416, AE412
AE423	Aircraft Propulsion/II	80	70	6.00	C	AE413
AE424	Aircraft Airconditioning	79	46	5.00	C	AE414
AE425	Aircraft Engineering Materials	63	87	6.00	C	AE326
GE05	English Language/III	32	18	2.00	B	
		384	366	30.00		

Semester 9 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Module	Prerequisite
		hr/sem	hr/sem			
AE511	Aircraft Design/I	65	85	6.00	C	AE421,AE322, AE416
AE512	Aircraft Maintenance	48	52	4.00	C	
AE513	Aircrafts Systems and Instruments/I	34	91	5.00	C	
AE514	Aircraft Control Design	80	45	5.00	C	AE412,AE422
AE515	International Air Laws	48	52	4.00	C	
AE516	Engineering Project	65	85	6.00	C	
		340	410	30.00		

Semester 10 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
		hr/sem	hr/sem			
AE521	Aircraft Design/II	65	85	6.00	C	AE511
AE522	Aircrafts Systems and Instruments/II	34	91	5.00	C	AE513
AE523	Aviation Management	48	77	5.00	C	
AE524	Elective	79	71	6.00	E	
GE006	English Language/IV	32	18	2.00	B	
AE529	Engineering Project	66	84	6.00	C	AE516
		324	426	30.00		

Electives	
AE524	Computer Aided Design CAD
AE525	Wind Tunnel Techniques
AE526	Helicopters

8. **Contact**

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