Al-Balqa' Applied University

جامعة البلقاء التطبيقية

تأسست عام 1997

Curriculum for Associate Degree
in
Aircraft Electrical Systems and Instrumentation Specialization

The curriculum of associate degree in **"Aircraft Electrical Systems and Instrumentation"** specialization consists of (72 credit hours) as follows:

Serial No.	Requirements	Credit Hours
First	University Requirements	12
Second	Engineering Program Requirements	17
Third	Specialization Requirements	43
Total		**72**

The study plan of associate degree
in
Aircraft Electrical Systems and Instrumentation

First: University requirements (12 credit hours) as follows:

Course No.	Course Title	Credit Hours	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
22001101	Arabic Language	3	3	0	
22002101	English Language	3	3	0	
21901100	Islamic Culture	3	3	0	
21702101	Computer Skills	3	1	4	
Total		**12**	**10**	**4**	

Second: Engineering Program requirements (17 credit hours) as follows:

Course No	Course Title	Credit Hours	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
20201111	Engineering Workshops	1	0	3	-
20204111	AutoCAD	2	0	6	-
20506111	Occupational Safety	2	2	0	-
21301111	General Mathematics	3	2	2	-
21302111	General Physics	3	2	2	-
21302112	General Physics Laboratory	1	0	3	-
21702111	Communication Skills and Technical Writing	3	2	2	22002101
20201121	Engineering Materials	2	2	0	-
Total		**17**	**10**	**18**	

Third: Specialization Requirements (43 credit hours) as follows:

Course No.	Course Title	Credit Hours	Weekly Contact Hours		Prerequisite
			Theoretical	Practical	
20301113	Electrical Circuits	3	3	0	21302111*
20301114	Electrical Circuits lab	1	0	3	20301113*
20404121	Digital Fundamentals	2	2	0	20403111
20404122	Digital Fundamentals Laboratory	1	0	3	20404121*
20605111	Maintenance Regulations and Airfield Safety	2	2	0	-
20604111	Principles of Flight	2	2	0	-
20603211	Aircraft Electrical Systems	3	3	0	20301113
20603212	Aircraft Electrical Systems Workshops	1	0	3	20603211*
20604221	Aircraft Engines	2	2	0	-
20605121	Soldering Techniques	1	0	3	-
20602111	Electronic Devices and Circuits 1	3	3	0	20301113
20602112	Electronic Devices and Circuits 1 Laboratory	1	0	3	20602111*
20602211	Electronic Devices and Circuits 2	3	3	0	20602111
20602212	Electronic Devices and Circuits 2 Laboratory	1	0	3	20602211*
20603221	Aircraft Instrumentation	3	3	0	20602111
20603222	Aircraft Instrumentation Workshops	2	0	6	20603221*
20602221	Fundamentals of Navigation and Communication	3	3	0	20604111
20405231	Fundamentals of Radar Theory	3	3	0	20604111
20603291	Training**	3	0	-	-
20603292	Project	3	0	-	-
Total		**43**	**29**	**24**	

*-Co-requisite

** Equivalent to 280 training hours

Guiding Plan

First Year					
First Semester			**Second Semester**		
Course No.	**Course Title**	**Credit Hours**	**Course No.**	**Course Title**	**Credit Hours**
20301113	Electrical Circuits	3	22001101	Arabic Language	3
20301114	Electrical Circuits Lab.	1	20604111	Principles of Flight	2
22002101	English Language	3	20204111	AutoCAD	2
21702101	Computer Skills	3	21901100	Islamic Culture	3
21302111	General Physics	3	20602111	Electronic Devices and Circuits 1	3
21302112	General Physics Lab.	1	20602112	Electronic Devices and Circuits 1 Lab.	1
21301111	General Mathematics	3	21702111	Communication Skills and Technical Writing	3
20201111	Engineering Workshops	1			
Total		**18**	**Total**		**17**

First Year		
Summer Semester		
Course No.	**Course Title**	**Credit Hours**
20605111	Maintenance Regulations and Aircraft Safety	2
20506111	Occupational Safety	2
20404121	Digital Fundamentals	2
20404122	Digital Fundamentals Laboratory	1
20605121	Soldering Techniques	1
Total		**8**

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2008/2009

Second Year					
Third Semester			**Fourth Semester**		
Course No.	**Course Title**	**Credit Hours**	**Course No.**	**Course Title**	**Credit Hours**
20603211	Aircraft Electrical Systems	3	20602211	Electronic Devices and Circuits 2	3
20603212	Aircraft Electrical Systems Workshops	1	20602212	Electronic Devices and Circuits 2 Lab.	1
20604221	Aircraft Engines	2	20602221	Fundamentals of Navigation and Communication	3
20405231	Fundamentals of Radar Theory	3	20603291	Training	3
20603221	Aircraft Instrumentation	3	20603292	Project	3
20603222	Aircraft Instrumentation Workshops	2			
20201121	Engineering Materials	2			
Total		**16**	**Total**		**13**

Brief Course Description

University Requirements

Course Title	Course No	Credit Hours (Theoretical /Practical)
Arabic Language	**22001101**	**3 (3-0)**

تتضمن هذه المادة مجموعة من المهارات اللغوية بمستوياتها وأنظمتها المختلفة: الصوتية، والصرفية، والنحويــة، والبلاغية، والمعجمية، والتعبيرية، وتشتمل نماذج من النصوص المشرقة: قرآنية ، وشعرية، وقصصية ، من بينها نماذج من الأدب الأردني؛ يتوخى من قراءتها وتذوقها وتحليلها تحليلا أدبيا؛ تنمية الذوق الجمالي لــدى الطـــلاب الدارسين.

English Language	**22002101**	**3 (3-0)**

English 1 is a general course. It covers the syllabuses of listening, speaking, reading, writing, pronunciation and grammar, which are provided in a communicative context. The course is designed for foreign learners of the English language, who have had more than one year of English language study. The extension part would be dealt with in the class situation following the individual differences.

Islamic Culture	**21901100**	**3 (3-0)**

1. تعريف الثقافة الإسلامية وبيان معانيها وموضوعاتها والنظم المتعلقة بها – وظائفها وأهدافها.

2. مصادر ومقومات الثقافة الإسلامية والأركان والأسس التي تقوم عليها.

3. خصائص الثقافة الإسلامية.

4. الإسلام والعلم، والعلاقة بين العلم والإيمان

5. التحديات التي تواجه الثقافة الإسلامية.

6. رد الشبهات التي تثار حول الإسلام.

7. الأخلاق الإسلامية والآداب الشرعية في إطار الثقافة الإسلامية.

8. النظم الإسلامية.

Computer Skills	**21702101**	**3 (1-4)**

An introduction to computing and the broad field of information technology is given. Topics covered include the basic structure of digital computer system, microcomputer, operating systems, application software, data communication and networks, and the internet. Hands-on learning emphasizes Windows xp, MS-office2000, and the internet.

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Engineering Program requirements

Engineering Workshops	20201111	1 (0-3)

Development of basic manual skills in Mechanical and Electrical works. Use of manual tools and measuring devices. Hand filing, welding, metal cutting and forming. Electrical wiring.

AutoCAD	20204111	2 (0-6)

Introduction to AutoCAD, application of AutoCAD, commands, geometric entities. Geometric construction. Dimensioning, free –hand sketching, object representation, orthographic drawing and projections.

Occupational safety	20506111	2 (2-0)

Role of technicians in economic development First aid accident prevention. Protective devices and equipment. Industrial safety standards. Nature of fire hazards. Sand fire regulations. Physiological effects of electrical shock on human body. First aid and treatment for the effects of electric shock. Rules of spare and chemicals storage and handing.

Communication Skills and Technical Writing	21702111	3 (2-2)

The main goal of this course is to equip the students with the necessary communication skills in everyday life & work situations and improve their abilities in technical writing to meet market needs. For this course, the English language is the language of teaching & the means of communication for all classroom situations.

Engineering Materials	20201121	2 (2-0)

Definition of engineering materials. Classification of materials and their properties. Metallic and non-metallic materials. Metals, alloys and composite materials. Conductors, insulators and semiconductors. Mechanical, Magnetic, Thermal and electrical characteristics of materials. Industrial applications of different types of materials.

General Mathematics	21301111	3 (2-2)

Real numbers coordinate planes, lines, distance and circles. Functions: (operations and graphs on functions), limits, continuity, limits and continuity of trigonometric functions. Exponential and logarithmic functions. Differentiation (techniques of differentiation, chain rule, implicit differentiation). Application of differentiation (increase, decrease, concavity). Graphs of polynomials. Applications: Rolls Theorem and Mean-Value Theorem, Integration (by substitution, definite integral, fundamental theorem of Calculus). Application of definite integral (area between two curves, volumes)

General Physics	21302111	3 (2-2)

Physics and measurement, motion in one dimension, vectors, laws of motion, circular motion, energy and energy transfer, potential energy, linear momentum and collisions, electric fields, Gauss's law, electric potential, capacitance and dielectrics, current and resistance, direct current circuits, magnetic fields, sources of the magnetic field, and Faraday's law of electromagnetic induction.

General Physics lab	21302112	1 (0-3)

In this course, the student performs thirteen experiments in mechanics and in electricity.

Specialization Requirements

Maintenance Regulations and airfield safety	20605111	2(2,0)

The first part handles those areas related to aircraft maintenance concept, the second part deals with the safety requirements associated with safe operation of the aircraft.

Principles of Flight	20604111	2(2,0)

Generic ideas about the airplane, theory of flight, stability of the aircraft, basic aerodynamics, and studies of rotary-wing aircraft.

Aircraft electrical system	20603211	3(3,0)

Studies in about the types of power supply, controlling, protection and power utilization component and system in the aircraft.

Aircraft electrical system workshop	20603212	1(0,3)

Applications on power supply that enable the student to assemble, dissemble, and operate the various types of power supply. It also includes maintenance and troubleshooting.

Electronic Devices and Circuits 1	20602111	3(3,0)

Semiconductor materials and PN junctions, diodes and applications, special diodes, transistors, power electronic devices.

Electronic Devices and Circuits 1 Laboratory	20602112	1(0,3)

A comprehensive set of exercises enabling the student to practice the theoretical knowledge gained in the class room about Semiconductor materials and PN junctions, diodes and applications, special diodes, transistors and power electronic devices

Electronic Devices and Circuits 2	20602211	3(3,0)

Small signal BJT and FET, Power amplifiers, Amplifier frequency Response, Operational amplifiers, Oscillators, Filters.

Electronic Devices and Circuits 2 Laboratory	20602212	1(0,3)

 Amplifiers configuration and characteristics, operational Amplifiers, Oscillators, Filters.

Aircraft Engines	20604221	2(2,0)

Generic studies about Reciprocating engines, Turbine engines, and Aircraft Propellers.

Aircraft instrumentations	20603221	3(3,0)

Principle of operation, construction and the purpose of flight instrument, engine instrument and auxiliary instrument.

Aircraft instrumentations Workshop	20603222	2(0,6)

The practical workshop enables the student to practice the assembly and disassembly of instrument installing and removing the instrument from the aircraft and perform the mechanical checks of flight instrument, engine instrument and auxiliary.

Soldering Techniques	20605121	1(0,3)

General workshop safety, hand tools and measuring devices, wires and cables, PCB repair.

Electrical Circuits	20301113	3(3,0)

Voltage, Current, and Resistance, Ohm's Law, Energy and Power, Series-Parallel Circuits, Introduction to Alternating Current and Voltage, Capacitors, Inductors, RLC Circuits and Resonance. Electrical Measurements.

Electrical Circuits Laboratory	20301114	1(0,3)

DC and AC circuits. Resonance. Measuring devices.

Fundamentals of Radar Theory	20405231	3(3,0)

Introduction to radar theory, Pulse Modulated radar, requirements, performance of pulsed radar, transmitter, receiver، CW ground radar, radar altimeter, airborne Doppler principles, and MTI radar

Digital fundamentals	20404121	2(2,0)

Study of numerical systems, Theory of Boolean Algebra and logic circuits, Applications to different types of circuits, Study of Flip-Flops, Counters, Registers and Accumulators. Digital system memory including RAM, ROM and EPROM.

Digital fundamentals Laboratory	20404122	1(0,3)

Testing and troubleshooting instruments, Logic circuits, adders, comparators, encoders and decoders, flip-flops, counters, registers, memories RAM, ROM, EPROM.

Fundamentals of Navigation and Communication	20602221	3 (3,0)

Studies about the introduction to telecommunications, Measuring unit and Signal Parameters, Avionics fundamentals and Autopilots.

Training	20603291	3 (280 training hours)

Equivalent to 8 weeks of field training targeted to emphasize the ability of students to apply the theories in the real world of the profession.

Project	20603292	3

An integrated design project to practice the principles of analysis and design acquired throughout the course of the student's study.

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