Curriculum for Associate Degree Program
in
Aeronautical Telecommunications Engineering Specialization

The curriculum of associate degree in "Aeronautical Telecommunications Engineering" 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**

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

Al-Balqa' Applied University

جامعة البلقاء التطبيقية

تأسست عام 1997

The curriculum of associate degree
in
"Aeronautical Telecommunications Engineering" Specialization

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	-	
22002101	English Language	3	3	-	
21901100	Islamic Culture	3	3	-	
21702101	Computer Skills	3	1	4	
Total		**12**	**10**	**4**	

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

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

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

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	-	21302111*
20301114	Electrical Circuits Lab	1	-	3	20301113*
20404211	Microprocessors	3	3	-	20404121
20404212	Microprocessors Lab	1	-	3	20404211*
20403111	Electronics	3	3	-	20301113*
20403112	Electronics Lab	1	-	3	20403111*
20404121	Digital Fundamentals	2	2	-	20403111
20404122	Digital Fundamentals Lab	1	0	3	20404121*
20405111	Principles of Telecommunications	3	3	-	20301113
20405112	Principles of Telecommunications Lab	1	-	3	20405111*
20406211	Digital and Data Communications	2	2	0	20303111
20406212	Digital and Data Communications Lab.	1	0	3	20406211*
20406121	Aeronautical Telecommunications Workshops	1	0	3	-
20303121	Power Supply Systems in Airports	2	2	0	-
20406241	Radio Waves Transmission	3	3	-	20405111
20406242	Radio Waves Transmission Lab.	1	0	3	20406241*
20406243	Aeronautical Radio	2	2	0	20406241
20406244	Aeronautical Radio Lab.	1	0	3	20406243*
20406251	Air Traffic Control Radar	3	3	0	20406243
20406261	Radio Navigation Aids	2	2	0	20406243
20406291	Training**	3	-	-	-
20406292	Project	3	-	-	-
Total		**43**	**29**	**27**	

* Co-requisite

** Equivalent to 280 training hours

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

Study Plan for Associated Degree
In
Aeronautical Telecommunications Engineering

First Year					
First Semester			Second Semester		
Course No.	Course Title	Credit Hours	Course No.	Course Title	Credit Hours
22002101	English language	3	20204111	AutoCAD	2
21301111	General Mathematics	3	20405111	Principles of Telecommunications	3
20201121	Engineering Materials	2	20405112	Principles of Telecommunications Lab	1
20301113	Electrical circuit	3	20403111	Electronics	3
20301114	Electrical circuit lab	1	20403112	Electronics Lab	1
20201111	Engineering Workshop	1	21302111	General Physics	3
21702101	Computer skills	3	21302112	General Physics Lab	1
20506111	Occupational Safety	2	20404121	Digital Fundamentals	2
			20404122	Digital Fundamentals Lab	1
			20406121	Aeronautical Telecommunications Workshops	1
Total		**18**	**Total**		**18**

Second Year					
Third Semester			Fourth Semester		
Course No.	Course Title	Credit Hours	Course No.	Course Title	Credit Hours
20406211	Digital and Data Communications	2	20406244	Aeronautical Radio lab	1
20406212	Digital and Data Communications Lab	1	20406251	Air Traffic control Radar	3
20404211	Microprocessors	3	20406261	Radio Navigation Aids	2
20404212	Microprocessor s Lab	1	20406291	Project	3
20303121	Power Supply Systems in the Airports	2	20406292	Training	3
21702111	Communication skills and technical writing	3	20406241	Radio Waves Transmission	3
21901100	Islamic Culture	3	20406242	Radio Waves Transmission Lab	1
22001101	Arabic Language	3	20406243	Aeronautical Radio	2
Total		**18**	**Total**		**18**

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

Brief Course Description

University requirements

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

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تتضمن هذه المادة مجموعة من المهارات اللغوية بمستوياتها وأنظمتها المختلفة: الصوتية، والصرفية، والنحويـــة، 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 لـــدى الطـــلاب الدارسين.

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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)**

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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.

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

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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 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 Requirement

Electrical Circuits	20301113	3 (3-0)

Basic concepts and definitions. Electrical quantities. Circuits and circuit elements. Passive and active elements. Energy sources. Open circuits, closed circuits, short circuits. Series, parallel and compound circuits. DC and AC circuits. Characteristics of sine waves. Basic calculations: current, voltage, voltage drop, power, energy, active power, reactive power, power factor. Three-phase circuits: basic configurations; phase/ line voltages and currents. Introduction to electrical measurements: devices, circuitry.

Electrical Circuits Lab.	20301114	1 (1-3)

Measuring current, voltage and power. DC series and parallel circuits. AC series and parallel circuits

Electronics	20403111	3 (3-0)

Semiconductor devices. Diodes: classification, characteristics and applications. Transistors: classification, characteristics and applications. Amplifiers. Oscillators. Logic gates and Integrated circuits: Basic functions, symbols and applications. Introduction to electronic measurements: Oscilloscope applications.

Electronics Lab.	20403112	3 (0-3)

Use of oscilloscope in measurements. Investigation of characteristics of semiconductor devices. Construction and study of electronic circuits. Experiments in electronics have to cover the main electronic devices (diode, zener diode, diode applications, BJT, FET, op – amp, oscillator, SCR).

Digital Fundamentals	20404121	2 (2-0)

Numerical systems, operations, and codes, logic gates, Boolean algebra and logic simplification, combinational logic and function of combinational logic, flip – flops, counters, shift registers. Fixed – function Integrated Circuits, and Programmable Logic Devices (PLDs).

Digital Fundamentals Lab.	20404122	1 (0-3)

Experiments in digital fundamentals have to cover logic gates, combinational logic, flip – flops, counters, shift registers.

Principles of Telecommunications	20405111	3(3.0)

Telecommunications link configuration, Frequency spectrum, measuring units and signal parameters, Modulation principles and types (AM, FM, PCM, Delta Modulation), and digital modulation, Transmitters and receivers.

Principles of Telecommunications Lab	20405112	1(0.3)

Amplifiers and Attenuators, Tuned circuits, filters, AM and FM modulation demodulation, demodulation, sampling, PCM, delta modulation.

Digital and Data Communications	20406211	2(2.0)

Basic communication systems, Digital Radio, Pulse modulation , FSK,PSK,QAM, Digital transmission, pulse code Modulation, Error detection and correction, Digital encoding, Multiplexing, OSI protocol architecture, TCP/IP suite, Local Networks, Wide Area Networks .

Digital and Data Communications Lab	20406212	1(0.3)

Introduction to digital communications Kit, Pulse code Modulation, Delta Modulation, Digital encoding and decoding, Time Division Multiplexing, Phase shift Keying, Frequency shift Keying, Networking Media, Constructing Basic LAN, LAN cable meter, Constructing Basic WAN.

Aeronautical Telecommunications Workshops	20406121	1(0.3)

Experiments in different Digital and analogue instruments such as, multi meters, bridges, watt meters, oscilloscopes, signal generators , frequency counter, phase meter, transistor and IC tester.

Microprocessors	20404211	3(3.0)

Introduction to Microprocessors, types of microprocessors 4, 8,16, 32, 64 Bit microprocessors, microprocessor architecture , 8085 microprocessor architecture, registers and their applications in microprocessors. Memory types and methods of interfacing them with 8085.serial and parallel interfacing using support chips (8255 MUART).the DMA

Microprocessors Lab	20404212	1(0.3)

In this Lab, students will learn how to use 8085 microprocessor instructions and learn how to write programs contain, move instructions, add and subtraction instructions, rotate ,jump and exchange instructions in addition to logic operations in simple and advanced level programs.

|Power Supply System in the Airports	20303121	2(2.0)

Power Supply systems, standby generator, ups, batteries' , ATS Switch ,A.C In stallion, D.C Installation.

Radio Wave Transmission	20406241	3(3.0)

Types and characteristics of transmission line, transmission line theory and application, resonant and non- resonant transmission line, optical fiber theory and application, antenna theory, antenna terminology, antenna types, antenna pairs, electromagnetic waves, wave phenomenon, wave propagation, mobile and satellite propagation.

Radio Wave Transmission Lab	20406242	1(0.3)

Introduction to the transmission lines kit, primary and secondary factors measurement Behavior of T.L under various load, short circuit and open circuit terminal condition .polar diagram of radiation pattern for different antennas types.

Aeronautical Radio	20406243	2(2.0)

General classification of radio transmission, ICAO standard specification, ground-air-ground communication , aeronautical radio transmitter and receiver, micro wave system, voice communication system, fiber optical communication system.

Aeronautical Radio Lab	20406244	1(0.3)

RF electronic voltmeter, RF signal generators, RF wattmeter , Identification and analysis and trouble shooting of AM/FM transmitter and receiver circuits, VHF aeronautical transmitter and receiver   (testing and tuning and fault finding) , VHF transceiver (performance and fault finding) .

Air Traffic control Radar	20406251	3(3.0)

Common concepts to primary and secondary radar, radar wave guide (W/G) theory, radar wave guide components, radar microwave sources, primary surveillance radar, radar transmitters and receiver, radar signal processing and plot extraction , conventional & Mono pulse secondary surveillance radar , radar displays and antennas.

Radio Navigation Aids	20406261	2(2.0)

Instrument Landing System (ILS). Space Modulation and ILS Waveforms. Difference in depth of Modulation (DDM).Glide Slope Antenna-Array. Glide Slope DDM & path width. Localizer Radiation Patterns. Localizer DDM& course width , Marker ,VOR principles , VOR Antenna & Radiation Pattern, RF Phasing ,VOR Block Diagram, Doppler VOR, DME Principles , DME Terminology and Parameters and Block Diagram, DGPS, papi precision approach path Indicator.

Project	20406291	3

An integrated assembly/design project (practical work) related to the major fields of study.

Training	20406292	3 (280 training hours)

Equivalent to 280 hours of field training targeted to emphasize the ability of students to apply the theories in Aeronautical communication system, primary and secondary radar, and radio navigation aids.