Curriculum for Associated Degree Program in Communications and Computer Networks Engineering Specialization

The curriculum of associate degree program in **Communications and Computer Networks 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**

The curriculum of associated degree in Communications and Computer Networks 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: 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 Lab	1	-	3	21302111
21702111	Communication Skills & Technical Writing	3	2	2	22002101
20201121	Engineering Materials	2	2	-	
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*
20403111	Electronics	3	3	0	20301113*
20403112	Electronics Lab	1	0	3	20303111*
20404121	Digital Fundamentals	2	2	0	20303111
20404122	Digital Fundamentals Lab	1	0	3	20404121*
20405111	Principles of Telecommunications	3	3	0	20301113
20405112	Principles of Telecommunications Lab	1	0	3	20405111*
20407211	Digital Communications & Modulation Techniques	3	3	0	20405111
20407212	Digital Communications & Modulation Techniques Lab	1	0	3	20407211
20407121	Networking Transmission Media	1	1	0	20405111
20407122	Networking Transmission Media lab	1	0	3	20407121
20407131	Network Essentials	3	3	0	20407121
20407132	Network Essentials lab	1	0	3	20407131
20407233	Routing and Switching	3	3	0	20407131
20407234	Routing and Switching lab	3	0	9	20407233
20407235	Wireless LAN	3	3	0	20407131
20407236	Wireless LAN lab	1	0	3	20407235
20407242	Network Operating Systems	2	0	6	20407131
20407291	Training**	3	0	-	-
20407292	Project	3	0	-	-
Total		**43**	**24**	**39**	

*-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
22001101	English language	3	20404121	Digital Fundamentals	2
21301111	General Mathematics	3	20404122	Digital Fundamentals lab	1
20506111	Occupational safety	2	20407121	Networking Transmission media	1
20301113	Electrical circuits	3	20407122	Networking Transmission media lab	1
20301114	Electrical circuits lab	1	21302111	General Physics	3
21702101	Computer skills	3	21302112	General Physics Lab	1
20201111	Engineering workshop	1	20204111	Auto CAD	2
20501261	Engineering Materials	2	20403111	Electronics	3
			20403112	Electronics Lab	1
			20405111	Principles of Telecommunications	3
Total		**18**	**Total**		**18**

Second Year					
Third Semester			Fourth Semester		
Course No.	Course Title	Credit Hours	Course No.	Course Title	Credit Hours
20407211	Digital Communications & Modulation Techniques	3	20407235	Wireless LAN	3
20407212	Digital Communications & Modulation Techniques Lab	1	20407236	Wireless LAN lab	1
20407233	Routing and Switching	3	21901100	Islamic Culture	3
21702111	Communication Skills & Technical writing	3			
20407234	Routing and Switching lab	3	20407292	Project	3
20407131	Networking essentials	3	20407291	Training	3
20407132	Networking essentials Lab.	1	22001101	Arabic Language	3
20405112	Principles of Telecommunications Lab	1	20407242	Network Operating Systems	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)**

تتضمن هذه المادة مجموعة من المهارات اللغوية بمستوياتها وأنظمتها المختلفة: الصوتية، والصرفية، والنحوية، 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 لدى الطلاب 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.

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

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 Lab.	**20301114**	**1 (1-3)**
DC and AC circuits. Resonance. Measuring devices.		
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 Communications &Modulation Techniques	**20407211**	**3 (3-0)**
Basic communication systems, Introduction to information theory, Digital radio, FSK,PSK, QAM, Digital transmission, Pulse Code Modulation, Error detection and correction, Digital encoding, Multiplexing, communication over AWGM, Modulation Demodulation, channel coding.		
Digital Communications & Modulation Techniques Lab	**20407212**	**1 (0-3)**
Introduction to Digital Communications, Pulse Code Modulation, Delta Modulation, Digital encoding and decoding, Time Division Multiplexing, Phase Shift keying, Frequency Shift Keying, Pulse amplitude modulation, Clock generator and filters.		

Networking Transmission Media	**20407121**	**3 (3-0)**

Types and characteristics of transmission lines , transmission line theory and application, resonant and non- resonant transmission lines , optical fiber theory and application, wave guide theory , antenna theory, antenna terminology, electromagnetic waves .

Networking Transmission Media lab	**20407122**	**1 (0,3)**

Introduction to the transmission lines kit, primary and secondary factors measurement Behavior of T.L under various load, optical fiber measurements, line measuring set, and polar diagram of radiation pattern for different antennas types by using soft wave program.

Network Essentials	**20407131**	**3 (3-0)**

Personal Computer hardware, Operating systems, introduction to networking, Principles of communications, Ethernet, Internet service providers, Internet, Network cables and connectors, Network Devices, Network addressing, Network services, Layered model and protocols, Wireless LANs, Networking security, .

Network Essentials lab	**20407132**	**1 (0-3)**

Personal Computer hardware (H.D, RAM, OS), Building Peer-to-Peer networks, Determine MAC, Using ARP, IP address and ipconfig., Sharing resources, Internet connectivity, Construct cables (Straight, crossover, rollover), Network services (DNS, FTP, Email), Configure wireless client/AP, WLAN Security, Network troubleshooting.

Routing and Switching	**20407233**	**3 (3-0)**

Introduction to Routing and Packet forwarding, Static Routing, Dynamic Routing Protocols, Distance Vector Routing Protocols, RIP v1 and RIP v2 Routing Protocols, VLSM and CIDR, EIGRP Routing protocol, Link-State Routing Protocols and OSPF, Switch concepts and configuration, VLANs, Spanning Tree Protocol.

Routing and Switching lab	**20407234**	**3 (0-9)**

Router configuration, Static Route Configuration, Routing Protocols and Subnetting, routing tables interpretation, RIP v1 and RIP v2Configuration, Basic VLSM calculation and addressing design, EIGRP configuration, OSPF configuration, Switch configuration, VLAN configuration, Inter-VLAN routing.

Network Operating Systems	**20407242**	**2 (0-6)**

Introduction Linux Operating System, working with Linux File System, Users and Groups, access permissions, Linux File system, Bash Shell, standard input/output and pipes, Networking, string processing, manage processes, vi editor, Linux Red Hat installation, file system management, system initialization, user and group administration, network configuration, system administration tools, RPM and boot loader, X window system, sharing directories, system rescue and troubleshooting, Windows 2003 server.

Wireless LAN	**20407235**	**3 (3-0)**
Introduction to 802.11 Wireless LANs, Radio Frequency (RF) Fundamentals, Spread Spectrum Technology, Wireless LAN Infrastructure Devices, Wireless LAN Organizations and Standards, 802.11 Network Architecture, Wireless LAN Security, Site Survey Fundamentals.		
Wireless LAN lab	**20407236**	**1 (0-3)**
Hardware, firmware and configuration of wireless clients, Build an Ad Hoc WLAN, Ad Hoc throughput analysis, Configuring , managing and power distribution of access points and bridges, Build infrastructure wireless network, Infrastructure throughput analysis, Cell sizing and ARS, Basic 802.11 wireless security, Co-channel and adjacent channel interference, Wireless bridging and repeaters APs, Site survey.		
Project	**204062191**	**3**
An integrated design project to practice the principles of analysis and design acquired throughout the course of the students 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 design, install, configure, and troubleshoot computer networks.		