

## Communication Information Systems Diploma

### I. Overview

Communication & Information Systems Diploma allows candidates who have a variety of theoretical backgrounds to realize actual systems with their electronic comprehension. Communication and Electronic Program is designed to meet the industry's needs for people who understand the principles, state-of-the-art technologies, and applications in communication and networking fields. It emphasizes on the foundation concepts in communication systems including communication systems, mobile networks, and wireless and computer networks.

### II. Key Words:

Mobile communication, communication systems, wireless systems, Computer Networks, Networks Security, network administration, data communications.

### III. Diploma Plan

Communication Information Systems Diploma Plan				
<b>Semester 1</b>	<b>Course 1</b> Circuit Design	<b>Course 2</b> Network Overview	<b>Course 3</b> Electronics	
<b>Semester 2</b>	<b>Course 1</b> Signals and Systems	<b>Course 2</b> Computer Networks 2	<b>Course 3</b> Communication Systems	
<b>Semester 3</b>	<b>Course 1</b> Network Administration	<b>Course 2</b> Wireless and Mobile Communication systems	<b>Course 3</b> Network Security	<b>Course 4</b> VoIP Systems

**IV. Curriculum:**

**Semester 1:**

	<b>Course 1</b>	<b>Course 2</b>	<b>Course 3</b>
<b>Semester 1</b>	<b>Circuit Design</b>	<b>Network Overview</b>	<b>Electronics</b>

**Circuit Design:**

Introduction to theory, analysis and design of electric circuits. Voltage, current, power, energy, resistance, capacitance, inductance. Kirchhoff's laws node analysis, mesh analysis, Thevenin's theorem, Norton's theorem, steady state and transient analysis, AC, DC, phasors, operational amplifiers, transfer functions. Application to the theory, analysis and design of electric circuits. Voltage, current, power, energy, resistance, capacitance, inductance.

**Network Overview:**

The course introduces the concept of *Computer Networks*, including the different equipment and protocols of local and wide area networks. The course will discuss also the network topologies and technologies such as 802.11, broadband wireless, ADSL, Bluetooth, gigabit Ethernet, the Web, the wireless Web, streaming audio, IPsec, cryptography and more, using real-world examples and practical labs showing how networks work on the inside, from underlying physical layer hardware up through today's most popular network applications. Students will practice networking planning, deployment, configuration and troubleshooting using simulator software and practical labs.

**Electronics:**

This course includes the following topics: Semiconductors, P<sub>N</sub> junction: current-voltage characteristics, Diode models, Diode circuit applications. Bipolar junction transistor (BJT): structure, current-voltage characteristics, DC biasing, small-signal model, BJT amplifiers. Metal Oxide Semiconductor Field-Effect Transistor (MOSFET): Structure, current-voltage characteristics, DC biasing, small-signal model, MOSFET amplifiers.

**Semester 2:**

	<b>Course 1</b>	<b>Course 2</b>	<b>Course 3</b>
<b>Semester 2</b>	<b>Signals and Systems</b>	<b>Computer Networks 2</b>	<b>Communication Systems</b>

### **Signals and Systems:**

The course will provide strong foundation on signals and systems which will be useful for creating foundation of communication and signal processing. The students will learn basic continuous time and discrete time signals and systems. Student will understand application of various transforms for analysis of signals and systems both continuous time and discrete time. Students will also explore to power and energy signals and spectrum.

### **Computer Networks 2:**

This course develops the knowledge and the skills for knowing more about the technologies and the services used in LAN and WAN.

As well as, it gives further knowledge on how to scale computer networks using DHCP, NAT and PAT and how to secure networks using Access Control Lists.

Application: Packet Tracer

### **Communication Systems:**

This course provides an introduction to modern communication systems from signal processing point of view. The main topics covered include fundamentals of analog and digital modulation methods, probability theory, random processes, and noise, and the effects of channel noise on the performance of analog and digital communication systems.

### **Semester 3:**

	<b>Course 1</b>	<b>Course 2</b>	<b>Course 3</b>	<b>Course 4</b>
<b>Semester 3</b>	<b>Network Administration</b>	<b>Wireless and Mobile Communication systems</b>	<b>Network Security</b>	<b>VoIP Systems</b>

### **Network Administration:**

The aim of the course is to enable students to plan, install, and setup, manage, administer and troubleshoot a network system. Students are introduced to the fundamental models of Enterprise Networks and system administration. These include the installation of Microsoft Windows Server, operation system, configuring Active Directory and Domain Services and the administration of users and groups and their policies. The course also covers administration and configuration of core networking services such as DNS, DHCP, Certificate of Authority, etc.

### **Wireless and Mobile Communication systems:**

The course starts with a detailed view of the wireless propagation channel, the wireless environment and the modulation techniques used in wireless systems.

We focus on the detailed implementation of the key mobile systems, namely GSM UMTS and 4G/LTE, from the viewpoints of system architecture, the physical layer and system implementation and take a detailed look at the physical and logical channel implementation.

### **Network Security:**

This course focuses on the underlying concepts of computer systems security and information protection. It enables the student to discover the nature of computer security, threats, and vulnerabilities; assess the risks; develop computer security policy, communications and network security; apply disaster recovery, and, to deal with computer viruses. Topics include: Block Ciphers, Data Encryption Standard (DES algorithm), Public-Key Cryptography, RSA algorithm, Authentication Protocols (SSL, KERBEROS), Message Authentication, Authentication Application, Hash Functions, Digital Signatures, Pretty Good Privacy (PGP) service, Electronic Mail Security, IP Security, Web Security, Malicious Software and Firewalls.

### **Voip Systems:**

To provide an understanding of converged voice and data networks as well as the challenges faced by their various technologies

### **V. Contact:**

Mrs. Mirna Takkoush  
Registrar Coordinator  
mirna.takkoush@muc.edu.lb  
TEL: 00961-1-555896 ext 109

Mrs. Sohad Hammoud  
Admission Officer  
sohad.hammoud@muc.edu.lb  
Mobile: 96171570550