

Selective topics:

1- Digital Electronics		الإلكترونيك الرقمي
1	Logic gates, logic simplification.	
2	Karnaugh maps	
3	Arithmetic circuits: Adders, Subtractors, Decoders, Encoders, Multiplexers, DE-multiplexers, and Comparators	
4	Flip-flops	
5	Counters	
6	Shift-registers	

2- Microprocessor Architecture		معمارية المعالج الدقيق
1	8085 microprocessor (Internal architecture, Pin description, Interrupts types)	
2	8086 microprocessor (Internal architecture, Pin description, Interrupts types)	
3	8288 bus controller, 8284 Clock generator, Bus timing	
4	8086 memory and I/O interfacing	
5	8086 software applications	

3- Real Time Systems Design

تصميم منظومات الزمن الحقيقي

- 1 Parallel interface and its handshaking.
- 2 Programmable interval timer
- 3 Serial communication interface and programmable communication interface controller
- 4 Direct memory access controller
- 5 Types of Interrupt and programmable interrupt controller

4- Digital Signal Processing

معالجة الإشارة الرقمية

- 1 Properties of discrete system
- 2 Types of discrete signals
- 3 Transformation of discrete time signals (time and amplitude transformation)
- 4 Correlation, auto-correlation, Convolution and their properties
- 5 FIR and IIR filters
- 6 DFT and FFT

5- Computer Networks Fundamentals

أسس شبكات الحاسوب

- 1 The ISO reference Model, and TCP/IP Reference Model.
- 2 Digital signals transmission and media
- 3 Access protocols, and IP addressing
- 4 Bandwidth-Limited Signals, The Maximum Data Rate of a Channel
- 5 Connection-Oriented Versus Connectionless Service, and Service Primitives
- 6 DATA LINK LAYER DESIGN ISSUES: Framing, Error Control, and Flow Control

6- Advanced Computer Technology

تكنولوجيا الحاسوب المتقدم

- 1 Protected Mode of 80386 microprocessor
- 2 Real Mode of 80386 microprocessor
- 3 Paging Unit
- 4 Memory Management
- 5 Cache Memory Organization Types
- 6 Granularity bit property of 80386

7- Multimedia Computing

حوسبة الوسائط المتعددة

- 1 Type of Images
- 2 Images files Format
- 3 Image Compression Techniques (1)
- 4 Video Basics
- 5 Type of Video Signals
- 6 Histogram Modification and Histogram equalization

8- Advanced Digital Electronics

الإلكترونيات الرقمية المتقدمة

- 1 FPGA Architecture and Programming
- 2 VHDL Concurrent and Sequential codes
- 3 Finite State Machine
- 4 VHDL Packages, Components , Functions and Procedures
- 5 Logic Function Using Building Blocks
- 6 Embedded FPGA Functions BRAM, Multipliers

9- Computer Networks Protocols		بروتوكولات شبكات الحاسوب
1	Application Layer Protocols: (HTTP, FTP, SMTP, DHCP, DNS, SNMP, SSH, BGP, RIP)	
2	Transport Layer Protocols: (UDP, TCP)	
3	Network layer Protocols: (IPv4, IPv6, IPsec, ICMP, IGMP), Routing algorithms	
4	Data Link Layer: (Ethernet, DSL, ISDN, FDDI), CSMA/CD, CRC, ARP, PPP	
5	Physical layer protocols: OTN, SONET/SDH, the Bluetooth protocol stack	

10- Security of Computer Networks		أمنية شبكات الحاسوب
1	Symmetric key ciphering	
2	Asymmetric key cipher	
3	Authentication protocols	
4	OSI security Architecture , a model for network security	
5	Network protection service: IP and E-Commerce protection, VPN	