Computer Network & Internet

- The OSI model and TCP/IP protocol suite.
- TCP / IP Network layer.
- IPv4 addressing
- Delivery and Forwarding of IP packets.
- IP v4
- Address Resolution Protocol ARP
- Internet Control Message Protocol ICMP
- Unicast Routing Protocol
- Multicasting and multicast routing protocol

Ref1:   **"TCP/IP Protocol Suite"**   by Behrouze
Ref2:   **" Data Communication"**   by Behrouze

Advanced Artificial Intelligence

- Soft computing
  - Fuzzy logic
  - Neural Network
  - Genetic Algorithms
- Expert systems
- Neural expert systems
- Hybrid intelligent systems
- Intelligent NN
- Knowledge representation

Ref1:   **"Artificial Intelligence, structures and strategies for complex problem solving"**, By: George Luger & William Stubblefield
Ref2: **"Artificial intelligence, a guide to intelligent systems"**
By: Michael Negnevitsky

Operating System

1- Processes
2- Threads
3- Process synchronization
4- CPU scheduling
5- Deadlocks
6- Memory management and virtual memory
7- Mass-storage and file system
8- Security and protection

Ref1: **"Operating System Concepts"**

By   Abraham silberschatz, Peter bear galvin, Greg gagne. 9th ed., 2013

Advanced Microprocessor

1- The 8088 and 8086 microprocessor and their memory and input/output interfaces
2- Interrupt interfaces
3- Pc bus interface
4- Real mode software and hardware 80286
5- Protected mode 80386,80486 and Pentium (software and hardware)

Ref1. **"The 8088 and 8086 Microprocessors, programming, interfacing, software, hardware, and application"**,

By Trieble and singh, 4th ed., 2003

Network **S**ecurity

- Security Attack, Security Services, Security Mechanisms
- Attack on TCP/IP
- Electronics Mail Security
- IP Security
- Web Security
- Intrusion Detection
- Firewall

Ref1: **"Cryptography and Network Security: Principles and Practice"** (2nd Ed.), William Stallings, Prentice-Hall, Inc., 1999.

Ref2: **"Cryptography and Network Security: Principles and Practice"** (7th Ed.) , William Stallings , Prentice-Hall, Inc., 2016

Image & **S**ignal **P**rocessing

- Introduction
- Image fundamentals
- Image transformation
- Image enhancement
- Image compression
- Segmentation
- Restoration
- Shape Representation

  Ref. 1

- Introduction
- Fundamentals of discrete time signals
- Digital filters

  Ref. 2

Ref1: **"Digital Image Processing"** by Rafael Gonzales.

Ref2: **"Fundamentals of Digital Signal Processing"** by Lonnes C. Ludeman