**Physical Layer**

Channel capacity

Channel Impairments: attenuation, dispersion/intersymbol interference/multipath, distortion due to non-linear behaviour.

Amplifiers and repeaters

Digital data encoding & digital modulation (ASK, FSK, QPSK, QAM)

FDM and FDMA

TDM and TDMA

Spread Spectrum

**Digital Communication Techniques**

Asynchronous and Synchronous Transmission

Parity Checking, Error Correction & Detection, CRC

Line configuration & topology.

**Data Link Control**

Flow Control: stop-&-wait, Go-back-N.   Calculate l

**Basics on Data Communication and Networks**

Switching & Broadcast networks.

LAN/MAN/WAN

Definition of Autonomous System

Protocol Architecture and Design Principles

OSI & TCP/IP Architectures.

**Local rea Networks**

Bus/Tree/Ring/Star Topologies

Aloha, Slotted Aloha, CSMA, CSMA/CD, CSMA/CA, Token Ring, FDDI. [You have to know how the protocols work].

Wireless LAN (architecture, problem(s), techniques counter measuring the problem(s))

Repeater, Bridge, Switch, Router. [What they are, how they function]

**Circuit and Packet Switching**

Circuit/datagram packet/virtual circuit packet switching [how they function, advantages, disadvantages]

**Internetwork Protocols**

IPv4, IPv6.  [What functionality of the fields in header support, how the functionality is implemented]

Fragmentation and Reassembly: how it works, how fragments are structured.

ARP, RARP, ICMP

UDP

TCP [flow control, timer RTO calculation (Jakobson algorithm), flow control, congestion control]

IP addressing, structure IP address, Classful/subnetting/Supernetting CIDR/Classless Addressing  Dynamic addressing. NAT.

Processing of IP addr                                                        net id, host id.
Determine mask prod                                                          ulation

**Routing & outing Protocols**

Static/Flooding/Random/Adaptive routing. [How they                          vantages disadvantages]

Dijkstra/Bellman-Ford Algorithms [how to use them, comparison].

Distance-Vector, Link State.

Routing table [content, built it]

Autonomous Systems [Definition, interconnectivity].

Interior Routing Protocol (IRP), Exterior Routing Protocol (ERP), OSPF, BGP. Functionality, differences.