## Transport Layer

**- Know what services the transport layer provides**

- Understand multiplexing and demultiplexing

**- Know the specifics of UDP**

- Understand the principles of reliable data transfers

**- Know the services TCP provides and what the services mean**

- Understand the TCP segment structure

- Understand how TCP calculates its timeout value

- Understand how TCP achieves reliable data transfer

**- Know TCP fast retransmit**

- Understand what flow control is and know how TCP deals with it

**- Know how TCP sets up a connect and why it is designed like that**

- Understand what causes congestion

- Understand the principles of congestion control

**- Know AIMD**

**- Know how TCP deals with congestion control**

- Understand TCP fairness

## Network Layer

**- Know the services that the network layer provides**

- Understand the difference between data plane and control plane

- Be familiar with longest prefix matching

**- Know the IPv4 header fields**

- Understand how IP addresses work

- Understand how DHCP works

**- Know how NATing works**

- Be familiar with IPv6

- Be familiar with different routing approaches

## Concurrency

- Understand the differences between processes, threads, and micro-threads

**- Know some of the pitfalls of dealing with shared memory**