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| 0301 | Lecture 1 | Intro | Delays |
| 0302 | Lecture 2 | Application Layer | http request and respond by telnet  http1.1: persistent and pipelining(结尾的caches 计算题？) |
| 0308 | Lecture 3 | Socket Programming | Socket codes |
| 0309 | Lecture 4 | Testing Socket, DNS |  |
| 0315 | Lecture 5 | Transport Layer Intro, UDP, Reliable Transport |  |
| 0316 | Lecture 6 | Developing a reliable transmission protocol no ppt |  |
| 0322 | Lecture 7 | Pipelining Reliable Protocols – GBN and SR |  |
| 0323 | Lecture 8 | GBN and SR Protocols |  |
| 0329 | Lecture 9 | Window Size and Sequence Number, Intro to |  |
| 0330 | Lecture 10 | TCP Timeout, TCP flow control and connection management |  |
| 0405 | Lecture 11 | TCP Congestion Control |  |
| 0406 | Lecture 12 | Transport Layer Review Questions, Intro to Security |  |
| 0426 | Lecture 13 | Network Layer Data Plane |  |
| 0427 | Lecture 14 | Network Layer Data Plane (cont’) |  |
| 0503 | Lecture 15 | Data Plane(cont’)/Routing Algorithms(Control Plane) |  |
| 0504 | Lecture 16 | Routing Algs(cont’) (Control Plane) |  |
| 0510 | Lecture 17 | Network Layer SDN and IPv6 |  |
| 0511 | Lecture 18 | Intro to Ling Layer |  |
| 0517 | Lecture 19 | CRC codes, Multiple Access Control |  |
| 0518 | Lecture 20 | Multiple Access Control |  |
| 0524 | Lecture 21 | LAN technology, ARP, Ethernet, Switching |  |
| 0525 | Lecture 22 | MPLS |  |
| 0531 | Lecture 23 | Security Revisited |  |
| 0601 | Lecture 24 | Review Lecture |  |

# review topic sheet

(Can be used as a guide in your studies so you don't leave things out of your review. Should be used in conjunction with the review lecture recording. Not a list to memorize definitions, be able to explain how each of these work and their advantages and disadvantages/limitations)

* Transmission delay, Propagation delay (be able to calculate, use and understand difference)
* C/S vs P2P – performance, differences Socket programming (explain; but not write code)
* TCP
* UDP
* ~~SMTP behaviour (not 2017, focussed on HTTP)~~
* DNS
  + Iterative and recursive queries
  + role of DNS in the Internet
  + DNS records
* HTTP
  + behaviour (prac)
  + 1.0 vs 1.1
  + Caching/proxies
  + Persistence
  + Pipelining
* ~~Differences between OSI & Internet layers (removed 2017)~~
* Transport layer –
  + functions
  + Port numbers and their use in TCP and UDP
  + GBN/SR
    - Pipelining – efficiency
  + Key components of reliable transport: (prac)
    - Window - sizes
    - Sequence number
    - ACKs/NAKs
    - checksums
    - Timeouts – RTT calculation
  + Propagation delay, transmission delay, queuing delay, processing delay
  + TCP Congestion control
    - Slow start
    - Congestion avoidance
    - Fast retransmit, fast recovery
  + Flow control
  + Connection establishment and termination
* Network layer –
  + functions
  + Algorithms –
    - link state vs distance vector
    - Dijkstra Distance Vector
    - How they work
    - Performance, advantages and disadvantages
  + Classfull addressing and CIDR
  + Subnetting
  + Inter intra AS routing
  + DHCP
  + Unicast, multicast, ~~(anycast - removed 2017)~~
  + Fragmentation
  + IPv6
    - What is different to IPv4 and why Transitioning to
  + Software Defined Networks (Control and Data Planes)  (added 2017)
* Link layer –
  + functions
    - Error correction/detection - (checksum,CRC, parity - 1D and 2D)
  + cycles and spanning tree
  + Multiple access approaches
    - Channel Partitioning
    - Random Access
    - Taking Turns
  + LAN topologies
  + Role of switches and how they forward frames
  + ARP
  + CSMA/CD
  + ~~CSMA/CA (removed 2017)~~
  + ~~PPP (removed 2017)~~
    - ~~Byte stuffing~~
  + MPLS
  + ICMP
  + Traceroute
  + Wireshark
* Security
  + Confidentiality
  + Data integrity
  + Authentication
  + Attacks
  + Nonces
  + Hash functions (sha, md5) –
  + fingerprint Encryption algorithms (3DES, AES)
  + Public key encryption (RSA)
  + Certificate Authorities
  + Secure e-mail
  + ~~SSL (removed 2017)~~
  + ~~IPsec (removed 2017)~~

Reviewing:

* recordings of lectures Textbook Podcasts Wireshark labs Tutorial questions, quizzes
* Past exams (last 3 years would be the most relevant) don't just look at answers! If you can't answer the questions then you need to do more review. Exam is not just a selection of these questions. Same concepts - but different questions. Need to understand concept not memorise how to answer questions.
* What to expect: There may be some definitions; but not many (or possibly none) Most will require explaining in your own words how things work
* Focus on key points not lots of wordy description
* Focus on \*significant\* differences and make sure you answer what is asked for – e.g. IPv6 has 128bit addresses is not an "advantage" and shouldn’t be given as a reason for IPv6 (however supporting a much larger address space -> more hosts is an advantage, note the difference between the actual advantage and how it is implemented
* Be ready to answer “what if” questions
* Look carefully for the question being asked - make sure you answer the question asked, not describe the technology mentioned in the question.  (e.g. "Why does reducing the length of the cable in a CSMA/CD network reduce the probability of collision?"  An answer which describes how CSMA/CD works - "The sender listens for a transmission and if it doesn't hear one, it starts to transmit....." is not an answer to the question and would not receive marks.)