

# CSE160: Computer Networks

## Review Session – Midterm

**2020-10-13**



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# Administrativa

- Midterm
- Friday October 16, 2020
- 10:30 am to 1:00 pm (2.5 hours)
  - The original finishing time was 12:30 pm (i.e. 2 hours)
  - This was corrected **after** the review session
  - A few students stated that they have another exam at 1:30 pm, so this was a Solomonic compromise to give more time to **most** of the students
  - Two (2) hours should be sufficient time to finish the exam, so if you finish earlier is fine too.
- Online



# Exam Format I

- LockDown Browser + Respondus Monitor
- Get familiar with the system, please use the testing exam
  - Available since the beginning of the semester!
  - Very few students have done this!
- A calculator will be included in the browser
- 6-7 questions, some short, some longer
  - Note that in the exam, questions cannot be grouped, so the total number of questions is much larger
  - E.g., the multiple-choice question is actually 10 individual questions
- There are **no penalties** for **wrong** answers
  - Please answer everything to the best of your ability



# Exam Format

- 1 question will be **multiple choice** (with no need to justify anything)
- All other question you need to **formally justify answers**
- A maximum of 100 points possible



# Key Topics I (not exhaustive list!)

- Statistical Multiplexing
- Protocol and Layering Mechanics
- End-2-End Principle
- Simple Link Model
  - Tx delay, Propagation delay, Queuing delay, Effective Throughput
- Different types of media
- Signals over different media and modulation



# Key Topics II (not exhaustive list!)

- Encoding schemes
  - NRZ, NRZI, Manchester, 4B/5B, 8B/10B
  - Clock recovery problem
- Passband modulation
- Nyquist and Shannon Limits
- Framing schemes
- Error correction and detection
  - Hamming distance, parity, 2D parity, Internet checksums, CRC, Error correction codes, etc.
  - When to use ARQ vs FEC?



# Key Topics III (not exhaustive list!)

- Multiplexing
  - TDM, FDM, hybrid schemes
- Randomized access
  - Aloha, CSMA variants, Classic Ethernet, Wireless Ethernet (including wireless propagation issues, hidden and exposed terminals)
  - Read Ethernet paper
- Contention-free protocols
  - Token ring, FDDI, DQDB, comparison with randomized access
- Bridges and Switches
  - Backward Learning, SPT algorithm
  - Read SPT paper



# Key Topics IV (not exhaustive list!)

- Network Layer
  - Service models, Internetwork, IP (including IP header format)
  - Packet fragmentation and path discovery
  - ICMP and applications (e.g. ping, traceroute, etc.)
  - DHCP and ARP
  - IPv6
- Routing Algorithms
  - Cost metrics and estimation
  - Flooding
  - DV routing (RIP)
  - Link-State routing (OSPF)
  - Equal-Cost Multipath routing





# Key Topics V (not exhaustive list!)

- Inter-domain routing
  - Hierarchical routing, Ases and BGP, Routing policies
- IP addressing
  - Address formats, hierarchy
  - Classful addresses, CIDR
  - Subnets and aggregation
- Reliability
  - ARQ, Stop-and-Wait, Sliding Windows
  - Flow Control
  - NO TCP header format (NOT included)!



# Questions?

