Outline for a CS123A

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1 PHILOSOPHY

- Give students a complete understanding of 1 network system.
- Extract the Unifying Systems Ideas: Multiplexing, resource allocation, naming and addressing, security.
- Give students a chance to run and experiment with Protocols:
- Give students insight into designing a Protocol:
- Give Students Insight into Real World Constraints:
- Give Relevant Homework:
- Give Research Ideas:
- Take a Unified Approach: Mostly real-life protocol design and systems issues. But will give a flavor of a) Formal Verification b) Distributed Algorithms c) Performance Analysis c) Physical Layer and Optics
- Understand what’s going on currently in the networking world

2 ROUGH COURSE OUTLINE

- INTRO: Philosophy, Course Outline, Layering. Hat Transfer Metaphor. Complete picture of mail transfer between two workstations. (2 lectures)
- PHYSICAL LAYER: Nyqvist and Shannon Theorems, Sampling and Clock Recovery and Eye Patterns. Types of media. (2 lectures).
• DATA LINK PROTOCOLS: Error Detection and CRCs. Error recovery, flow control, and initialization. Multiaccess links (Ethernet, token rings). Data link bridges. (Interlude on Protocol verification and invariants.) (6 lectures).

• ROUTING PROTOCOLS: Addressing, Neighbor determination, Routing Protocols (distance vector, path vector, link state). Forwarding. Virtual Circuit routing. (5-6 lectures.)

• TRANSPORT PROTOCOLS: Connection Management, TCP/IP and OSI Transport Solution. TCP Congestion Control. (2 lectures)

• CONCLUSION: What the course was all about. (1 lecture).