If you are ready for Quiz 1, you should be able to:

- describe the components of the internet according to the “nuts and bolts” model, including the role of each component.
- describe the role of the following components in the internet: protocol, network, hierarchy, standards, packet, router, communication link, application, connection-oriented service, connectionless service.
- identify the network components that belong to the core and to the edge of the internet.
- differentiate between circuit-switched and packet-switched networks, including the pros and cons of each, performance differences of each, and the mechanisms each use to share the network bandwidth.
- calculate end-to-end transmission time for data sent on a store-and-forward network with no delays.
- read, comment upon and review research papers with a strong process to store and search the knowledge gained from the paper.
- calculate delay in a packet-switched network as a sum of nodal processing delay, queueing delay, transmission delay and propagation delay.
- describe the algorithm used by traceroute to measure delay in real networks. Additionally, be able to use traceroute and interpret its output.
- argue the benefits of a layered architecture (as compared to monolithic).
- describe the internet's layered architecture according to the OSI model, including the mission of each layer, the scope of the layer, the type of data transferred by the layer and summary of the execution steps accomplished.
- describe the internet's layered architecture according to the TCP/IP model and argue the importance of architectural features of that model.
- explain the role of the IETF in the internet's operation.
- describe the goals of the TCP/IP design according to Clark88 and identify the fundamental goal.
- explain the ramifications of the robustness, multiple services and multiple networks goals on the design of the TCP/IP protocols.
- explain Saltzer84's “End-to-End” argument. Be able to describe exceptional situations where it may not apply as well as ways in which the modern internet may be moving away from this design philosophy.
- analyze business practices of various enterprises using the multi-tier network model (Tier-1, 2, etc) and common peering practices.
- describe the relationships and associated motivations for enterprises on the internet.
- analyze the effect of recent trends in internet usage patterns on the various business enterprises on the internet.

- describe interconnection methods between enterprise networks.
- describe the mission, scope, addressing mechanism and data types of the Application Layer.
- explain the HTTP protocol, including message format, interaction model and connection management.
- calculate response time for an HTTP request over nonpersistent, parallel or persistent connections, including the pipelined variant.
- describe how web proxies work to cache HTTP responses, including how they ensure consistency.
- describe the DNS service, including mission, interaction model, nameservers, domains, zones, load distribution, and domain name types.
- explain the DNS protocol, including message format, reliability, resource records, types, and caching mechanisms.
- describe the navigation mechanisms of DNS nameservers.
- describe the roles of the different nameservers in the DNS.
- describe how a CDN operates, including goals, host-roles, URL rewriting and DNS redirection.
- contrast the advantages of CDNs and web proxies.
- list reasons that led to the creation of P2P networks.
- describe what an overlay network is and how it is different from the internet.
- use historical P2P networks to describe centralized P2P networks, fully distributed P2P networks, hierarchical P2P networks.
- describe search techniques in the various P2P forms, and to analyze search efficiencies.
- describe the application of queuing theory to common networking problems.
- calculate simple queueing theory problems, including use of Little's law, M/M/1 and M/M/c measures of effectiveness. In such cases, all equations will be given.
- not memorize queueing theory equations.
- classify problems in terms of queueing system characteristics and know Kendall53 notation for those systems.
- prove you did the readings by answering general, large-concept questions about them.