جامعة الحسين التقنية
Al Hussein Technical University

Scheme of work

Spring2019

BTEC Unit:	**Unit 2**	**Title: Networking**	
Unit code	**H/615/1619**	**Credit Value: 15**	
Unit level	**4**		

HTU Course Title :	**Networks**	**HTU Course Code :**	**10201213**	
Credit value:	**15**	**GLH:**	**60**	**TQT: 150**
Lectures:	**25**	**Lecture duration:**	**2 Hrs.**	
Lab:	**10**	**Lab duration:**	**1 Hrs.**	
Tutorial Time:	**90 Hrs (independent learning time)**			

Instructors

Section 1: Eng. Moath Sulaiman

Learners should spend lesson time and non-supervised time working on assignments.

Class Schedule: Section 1: Mon/Wed: 11:30-1:30PM Classroom #: Iman8

Learning Outcomes (LO)	Assessment 1
1) Examine networking principles and their protocols.	☒
2) Explain networking devices and operations.	☒
3) Design efficient networked systems.	☒
4) Implement and diagnose networked systems.	☒

Sessions	Learning Outcome(s)	Session Activities
Session 1	LO1 Topic: Role of networks	Introduction to the unit contents, assessment types, the significance of networking in communication technologies. Sample activities: • Discuss the benefits and constraints of different **network types** and standards. • Investigate the purpose, resource implications, communications, working practice, commercial opportunity, information sharing and collaboration.
Session 2	LO1 Topic: System types	Analyse system types looking at real world scenario and networking types. Sample activities: • Discuss and study different system types. • Study the system types of peer based, client-server, cloud, cluster, centralised, virtualised.
Session 3	LO1 Topic: Networking topology	Understand networking topology and explore the size of a required network. Sample activities: • Investigate logical topology (e.g. Ethernet, Token Ring). • Investigate physical topology (e.g. star, ring, bus, mesh, tree, ring). • Explain the impact of network topology, communication and bandwidth requirements.

Sessions	Learning Outcome(s)	Session Activities
Session 4	LO1 Topic: Networking standards	Overview of OSI networking standards and explore the functionalities of different layers. Sample activities: • Explore and analyse conceptual models (e.g. OSI model, TCP/IP model), standards (e.g. IEEE 802.x). • Gain knowledge on 7-layer OSI reference model.
Session 5	LO2 Topic: Networking devices	Understand networking devices, their functionalities and selection decisions for network design. Sample activities: • Investigate networking devices and equipment. • Explore through servers; hub, routers; switches; multilayer switch, firewall, HIDS, repeaters; bridges; wireless devices; access point (wireless/wired), content filter, load balancer, modem, packet shaper, VPN concentrator. • Discuss and explore the operating principles of networking devices and server types.
Session 6	LO2 Topic: Networking software	Networking software requirements, interfacing with hardware and design requirements. Sample activities: • Explore through client software, server software, client operating system, server operating system, firewall. • Investigate hardware (e.g. network card, cabling), permissions, system bus, local-system architecture (e.g. memory, processor, I/O devices).

Sessions	Learning Outcome(s)	Session Activities
Session 7	LO2 Topic: Workstation, server selection	Server selection related to cost, performance and network size. Sample activities: • Develop a case study as a role play for a small organisation. • Discuss cost, purpose, operating system requirement. • Explore a range of server types and select server types and networking equipment required. • Justify the selection of a server regarding cost and performance optimisation.
Session 8	LO1 & 2 Topic: Review and preparation for assessment tutorial	Overview of learning covered in the first half of the unit, prepare report for assessment, formal written assignment covering LO1 and LO2. Sample activities: • Review requirements for assessment. • Consider the assessment requirements, review progress, plan for completion of assessment.
Session 9	LO3 Topic: User requirements	The significance of user requirements for quality system development. Sample activities: • Discuss quality expectations and the concept of system growth. • Produce a test plan for the selected case study. • Test and evaluate the design to meet the requirements. • Discuss and analyse user feedback requirements for continuous system improvement.

Sessions	Learning Outcome(s)	Session Activities
Session 10	LO3 Topic: Bandwidth	Understand bandwidth requirements and impact on network load. Sample activities: • Investigate bandwidth requirements, cost constraints and throughput. • Group work: Plan and design an observation form to investigate network load to investigate average and peak load. • Record average load and anticipated peak load with access to different networking labs if possible.
Session 11	LO3 & 2 Topic: Networking system communication	Plan and design a network system with a developed case study and analyse if it is fit for purpose. Sample activities: • Design a networked system to meet a given specification for the case study selected. • Investigate: Suited to devices, suited to users, supportive of lifestyle desires, supportive of commercial requirements. • Justify the security requirements and quality of service needs.
Session 12	LO3 Topic: Networking services and application	Understand IP addressing and domain name servers. Sample activities: • DHCP, static versus dynamic IP addressing, reservations, scopes, leases, options (DNS servers, suffixes), IP helper, DHCP relay, DNS records, Dynamic DNS. • Install and configure network services and applications.

Sessions	Learning Outcome(s)	Session Activities
Session 13	LO3 Topic: Scalable	Understand system scalability of enhancements and options for improvement. Sample activities: • Investigate what functionalities would allow a system to support device growth, support the addition of communication devices. • Discuss how to cope with bandwidth use and trend changes, protocol utilisation, addressing.
Session 14	LO3 Topic: Selection of components	Analytic factors for selection of networking components and their impacts. Sample activities: • Investigate supporting infrastructure needs. • Analyse supporting connectivity requirements.
Session 15	LO4 Topic: Networking devices	Understand installation of communication devices, allocation of addresses, local client configuration, server configuration and server installation. Sample activities: • Implement a networked system related to the design prepared in the LO1 and LO2 assessment.

Sessions	Learning Outcome(s)	Session Activities
Session 16	LO4 Topic: Verification of configuration and connectivity	Overview of connectivity verification methods. Sample activities: • Installation of internet work communication medium. • Conduct verification with (e.g. Ping, extended Ping, traceroute, telnet, SSH). • Record and evaluate Ping results as successful/unsuccessful.
Session 17	LO4 Topic: maintenance schedule	Plan and manage a maintenance schedule. Sample activities: • List steps for backup and restore depending on the network and operating systems you are using and upgrades. • Discuss the significance of upgrades and security requirements.
Session 18	LO4 Topic: Diagnose and resolve layer 1 problems	Document and analyse test outcomes against expected results. Sample activities: • Discuss the test techniques for framing, CRC, Runts and Giants. • Investigate dropped packets, late collisions and Input/Output errors.
Session 19	LO4 Topic: Systems monitoring	Plan systems monitoring and future enhancement directions. Sample activities: • Recommend potential enhancements for the networked system. • Utilisation, bandwidth needs, monitoring user productivity.

Sessions	Learning Outcome(s)	Session Activities
Session 20	LO3 & 4 Topic: Review and preparation for assessment tutorial	Overview of learning covered in the second half of the unit and collate the information (e.g. observation records, test results, design specification for assessment). Sample activities: • Review requirements for collating output and test results. • Consider the assessment requirements, review progress in gathering examples and plan for completion of the assessment.