Course Acronym:	ECHT
Course Number:	146
Descriptive Title:	CompTIA Network+ Computer Hardware Systems
Division:	Industry and Technology
Department:	Electronics and Computer Hardware Technology
Course Disciplines:	Electronic Technology, Electronics
Catalog Description:	This course is designed for the student pursuing a career as a computer service technician. Students will develop the skills and knowledge required for passing the CompTIA Network+ Certification exam. Topics include set up configuration and troubleshooting of networking hardware devices. Other areas explored include networking topology, cabling, wireless devices, network standards, protocols and security. Note: Letter grade or pass/no pass option.
Prerequisite:	
Co-requisite:	
Recommended Preparation:	Electronics and Computer Hardware Technology 140
Enrollment Limitation:	
Hours Lecture (per week):	2
Hours Laboratory (per week):	4
Outside Study Hours:	4
Total Course Hours:	108
Course Units:	3
Grading Method:	Letter Grade and Pass/No Pass
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	02/16/2010
Transfer UC:	No
Effective Date:	
General Education: ECC	
Term:	
Other:	

CSU GE:	
Term:	
Other:	
IGETC:	
Term:	
Other:	
Student Learning Outcomes:	**SLO #1 Course Notebook** The students will assemble and maintain a five-section course notebook. **SLO #2 CompTIA Network+ Certification Exam** Students will develop the skills and knowledge required for passing the CompTIA Network+ Certification exam. Topics include set up configuration and troubleshooting of networking hardware devices. Other areas explored include networking topology, cabling, wireless devices, network standards, protocols and security. **SLO #3 Open Systems Interconnection** Students will demonstrate their knowledge of Open Systems Interconnection (OSI), the seven layers of the OSI model, protocol and data packets, and the standard network model.
Course Objectives:	1. Analyze proper procedures for installing and configuring network components and devices. 2. Diagnose and troubleshoot network problems and determine whether they are hardware or software related. 3. Identify troubleshooting procedures in a networking environment and preventative maintenance techniques to maintain a network system. 4. Compare and contrast network standards, types of networks, topologies and hardware devices. 5. Explain the sharing of a printer on a network and identify the procedures for servicing network printers. 6. Identify the unique components of wireless network systems. 7. Select and define the types of networking media and hardware components. 8. Set up a new computer system to function on a secure network.
Major Topics:	**I. OVERVIEW OF THE COMPTIA NETWORK+ EXAM (1 hour, lecture)** A. The CompTIA Network+ exam B. History of computers and networking systems **II. THE COMPTIA NETWORK+ EXAM (2 hours, lab)** A. The CompTIA Network+ exam B. History of computers and networking systems **III. INTRODUCTION TO NETWORKING (2 hours, lecture)**

A. Types of networks
B. How networks are used

IV. INTRODUCTION TO NETWORKING (2 hours, lab)

A. Types of networks
B. How networks are used

V. NETWORKING STANDARDS AND THE OPEN SYSTEMS INTERCONNECTION (OSI) MODEL (2 hours, lecture)

A. Networking standards organizations
B. The OSI model

VI. NETWORKING STANDARDS AND OSI MODEL (4 hours, lab)

A. Networking standards organizations
B. The OSI model

VII. TRANSMISSION BASICS AND NETWORKING MEDIA (4 hours, lecture)

A. Transmission basics
B. Networking media
1. Coaxial cable
2. Twisted pair cable
3. Fiber-optic cable
4. Structured cabling

VIII. TRANSMISSION BASICS AND NETWORKING MEDIA (8 hours, lab)

A. Transmission basics
B. Networking media
1. Coaxial cable
2. Twisted pair cable
3. Fiber-optic cable
4. Structured cabling

IX. INTRODUCTION TO TRANSMISSION CONTROL PROTOCOL/INTERNET (TCP/IP) PROTOCOL (2 hours, lecture)

A. The TCP/IP core protocols
B. IP Version 4 and IP Version 6 addressing
C. Assigning IP addresses

X. INTRODUCTION TO TCP/IP PROTOCOL (4 hours, lab)

A. The TCP/IP core protocols
B. IP Version 4 and IP Version 6 addressing
C. Assigning IP addresses

XI. TOPOLOGIES AND ETHERNET STANDARDS (2 hours, lecture)

A. Physical topologies
B. Logical topologies
C. Ethernet standards

XII. TOPOLOGIES AND ETHERNET STANDARDS (4 hours, lab)

A. Physical topologies
B. Logical topologies
C. Ethernet standards

XIII. NETWORK HARDWARE (4 hours, lecture)

A. Network Interface Cards (NICS)
B. Hubs and repeaters
C. Bridges and switches
D. Gateways and routers

XIV. NETWORK HARDWARE (8 hours, lab)

A. NICS
B. Hubs and repeaters
C. Bridges and switches
D. Gateways and routers

XV. WIDE AREA NETWORKS (WANS) AND REMOTE CONNECTIVITY (2 hours, lecture)

A. WANS topologies
B. Remote connectivity

XVI. WANS AND REMOTE CONNECTIVITY (2 hours, lab)

A. WANS topologies
B. Remote connectivity

XVII. WIRELESS NETWORKS (2 hours, lecture)

A. Wireless transmission
B. Wireless networks
C. Bluetooth networks

XVIII. WIRELESS NETWORKS (4 hours, lab)

A. Wireless transmission
B. Wireless networks
C. Bluetooth networks

XIX. NETWORK OPERATING SYSTEMS (NOS) (2 hours, lecture)

A. Features of NOS
B. NOS and servers
C. Linux, Mac, Novell, Unix and Windows NOS

XX. NOS (4 hours, lab)

A. Features of NOS
B. NOS and servers
C. Linux, Mac, Novell, Unix and Windows NOS

XXI. ADVANCED TCP/IP NETWORKING (2 hours, lecture)

A. Designing TCP/IP networks
B. TCP/IP utilities

XXII. ADVANCED TCP/IP NETWORKING (3 hours, lab)

A. Designing TCP/IP networks
B. TCP/IP utilities

XXIII. VOICE AND VIDEO OVER INTERNET PROTOCOL (IP) (2 hours, lecture)

A. Voice Over IP (VoIP)
B. Video over IP (VIP)

XXIV. VOICE AND VIDEO OVER IP (2 hours, lab)

A. VoIP
B. VIP

XXV. NETWORK SECURITY (2 hours, lecture)

A. Security risks and threats
B. Physical security
C. NOS security
D. Wireless network security

XXVI. NETWORK SECURITY (4 hours, lab)

A. Security risks and threats
B. Physical security
C. NOS security
D. Wireless network security

XXVII. TROUBLESHOOTING NETWORK PROBLEMS (2 hours, lecture)

A. Network troubleshooting methods
B. Network troubleshooting tools

XXVIII. TROUBLESHOOTING NETWORK PROBLEMS (4 hours, lab)

A. Network troubleshooting methods
B. Network troubleshooting tools

XXIX. NETWORK INTEGRITY AND AVAILABILITY (2 hours, lecture)

	A. Malware B. Fault tolerance C. Data backups D. Disaster recovery **XXX. NETWORK INTEGRITY AND AVAILABILITY (3 hours, lab)** A. Malware B. Fault tolerance C. Data backups D. Disaster recovery **XXXI. NETWORK MANAGEMENT (2 hours, lecture)** A. Fundamentals of network management B. Fault and performance management C. Asset and change management **XXXII. NETWORK MANAGEMENT (4 hours, lab)** A. Fundamentals of network management B. Fault and performance management C. Asset and change management **XXXIII. SEMESTER PROJECT DEVELOPMENT (1 hour, lecture)** A. Critical analysis B. Individual and group discussion C. Outlining template for term project **XXXIV. SEMESTER PROJECT DEVELOPMENT (10 hours, lab)** A. Critical analysis B. Individual and group discussion C. Presentation of term project
Total Lecture Hours:	36
Total Laboratory Hours:	72
Total Hours:	108
Primary Method of Evaluation:	3) Skills demonstration
Typical Assignment Using Primary Method of Evaluation:	After replacing a network interface card in a customer's computer, the computer does not access the network or Internet. On a one-page lab report, list three possible reasons why the computer system cannot access the network and Internet. Submit lab report to the instructor.
Critical Thinking Assignment 1:	Provided with a new computer system, configure the system to logon to a networked environment, enter the proper system settings and test the system for proper operation and connectivity. Consult the instructor for evaluation.

Critical Thinking Assignment 2:	Troubleshoot a non-working wireless router. Diagnose and configure router for proper operation. Report findings on a one-page lab report and submit to the instructor.
Other Evaluation Methods:	Essay Exams Performance Exams Objective Exams Other Exams Quizzes Written Homework Laboratory Reports Class Performance Homework Problems Term or Other Papers Multiple Choice Completion Matching Items True/False Other (specify): Network System Design Research Assignment
Instructional Methods:	Demonstration Discussion Group Activities Guest Speakers Laboratory Lecture Multimedia Presentations Other (please specify): Computer Based Training (CD-ROM software for enhanced student training)
If other:	
Work Outside of Class:	Study Answer questions Skill practice Required reading Problem solving activities
If Other:	
Up-To-Date Representative Textbooks:	Anthony Sequeira. CompTIA Network+ Certification Guide. 1st Edition. Pearson Education. 2022. Todd Verge, LAB MANUAL FOR NETWORK+ GUIDE TO NETWORKS, 7th edition, Cengage Learning, 2015. (Discipline Standard)
Alternative Textbooks:	
Required Supplementary Readings:	
Other Required Materials:	Compact Disk Read Only Memory (CD-ROM) Digital Versatile Disc-Read Only Memory (DVD-ROM) 1 USB Flash Drive of at least 8GB of storage 1 - 3 Ring Binder - 1 1/2" hard cover
Requisite:	
Category:	

Requisite course(s): List both prerequisites and corequisites in this box.	
Requisite and Matching skill(s):Bold the requisite skill. List the corresponding course objective under each skill(s).	
Requisite Skill:	
Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable	
Requisite course:	Electronics and Computer Hardware Technology 140
Requisite and Matching skill(s):Bold the requisite skill. List the corresponding course objective under each skill(s).	**Understand computer system design and operational concepts.** ECHT 140 -Understand the operating principals of computer system hardware. **Understand analog and digital concepts involving computer systems.** ECHT 140 - Understand the operating principals of computer system hardware. **Assemble and disassemble personal computer systems and install operating system software.** ECHT 140 - Assemble and disassemble computer systems using industry standard techniques and safety procedures.
Requisite Skill:	
Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable	
Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Osanne Ugya
Date:	09/01/1989
Original Board Approval Date:	03/12/1990
Last Reviewed and/or Revised by:	Paul Akhigbe
Date:	01/05/2023

Last Board Approval Date:	07/17/2023 effective FALL 2024