Computer Engineering IV:
Networking and Troubleshooting

Fairfield Ludlowe High School - Fairfield Warde High School

Full Year

COURSE DESCRIPTION

The dive into Information Technology (IT) continues as we explore the fundamentals of Networking. This course focuses on the standards aligned to CompTIA Network+ (a standard IT certification) expanding on 'how a computer works'. Projects revolve around the building and maintaining a local area network with several computers and servers. Topics will include: networking & network connectivity, data transmissions & communication, servers & operating systems, cloud computing, network Security, network troubleshooting, designing and installing a network. The content of this course is aligned with CompTIA Network+ standards.

COURSE OBJECTIVES

Students will be able to:

- explain the different network topologies.
- discuss common network protocols.
- identify hardware used to build a computer network.
- consider the impact of digital citizenship on a network administrator
- make an RJ-45 Ethernet Cable.
- connect devices on a network.
- apply 802.3 and 802.11 standards.
- setup a wireless network.
- use network protocol analyzer to encode/decode transmissions.
- interpret the structure and contents of a UDP frame.
- assign IP addresses to nodes (static or DHCP).
- connect to a public DNS.
- use common ports to allow data onto a network.
- configure a router.
- build a VLAN.
- transmit video and audio signals.
- use common protocols to direct data.
- demonstrate remote access
- select operating system for specific uses.
- setup a server to perform a given task on the network.
- build an active directory on Local Area Network.
- create a virtual machine.
- demonstrate the use of a server operating system.
- apply RAID.

- work in a virtualized environment.
- use various network security tools.
- create secure data that uses encryption and/or authentication.
- physically secure a network.
- apply security measures to a Local Area Network.
- use a firewall to prevent unwanted data.
- use a cloud service to transmit data.
- exemplify cloud computing.
- explore various types of cloud computing
- demonstrate the troubleshooting process.
- identify which layer of the OSI a problem is related to.
- use tools to identify and resolve a network problem.
- install/use a UPS
- discover problems on a network.
- use the proper tool(s) to resolve an issue.
- create a list of factors to consider when designing a network
- use network design tools to create a model
- select a naming convention for a network.
- use a structure to manage a network

UNITS OF STUDY

Unit 1 - Introduction to Networking
Unit 2 - Network Connectivity
Unit 3 - Data Transmissions & Communication
Unit 4 - Servers & Operating Systems
Unit 5 - Network Security
Unit 6 - Cloud Computing
Unit 7 - Network Troubleshooting
Unit 8 - Designing and Installing a Network

COURSE POLICIES AND REQUIREMENTS

GRADING: Generally….See district policy (Policy 6146.1AR)

Grading Communication

- Specific grading expectations and practices will be communicated to all students and families at the start of the school year via a consistent format.
- If students or parents have questions about grading practices, they should follow the district's established chain of command structure (see district website) with the first contact being to the teacher and then to the school administration.
- Buildings will send out reminders of the importance of checking students' grades in the Grading Portal with directions.
- Teachers will notify guardians when students fall into the F range after October 1st.

Grade Reporting

- For a processed piece or "chunked" assignments that are part of a larger task, feedback and the grade shall be shared before the next step in the process, so long as students have submitted their work at those checkpoints, on time.
- Grades for summative assessments shall be entered within 10 school days from the date of submission or the date it was due, whichever is later.
- Grades for formative assessments shall be entered within 5 school days from the date of submission or the date it was due, whichever is later, and prior to any subsequent assessment.

Guidelines for Late Work :

- Teachers will accept late work for both summative and formative tasks beyond the due date.
- Teachers will not accept late work beyond the deadline for late work. The deadline is defined as the next class period from the due date of the assignment or the alternative date that the teacher and student may agree upon depending on individual circumstances.
- Teachers may reduce the total points students can achieve as a penalty for late work up to the deadline. Students will earn a zero (0) if the assignment is not submitted or is submitted after the deadline.
- Late work only consists of assignments with an expected due date. Assessments, such as tests, quizzes and in class assignments, must be taken on the scheduled date except in cases of make-up assessments due to an excused absence.

REASSESSMENT GUIDELINES:

Eligibility of assessments	Teachers of the same course will determine which summative assessments are eligible. Students can select any part of a project to reassess. Reassessments may not be allowed one week before the end of a term.
Process	Students have two class periods in which to indicate they would like to take a reassessment. Teachers will make clear to students their preferred method for students to request reassessment (*e.g.* email or filling out a simple form/spreadsheet).
Frequency	Students will have the opportunity to reassess on two summatives per year but not more than one per term (quarter).
Assessment Format	Based on discussion between the student and teacher, students will revise portions of the original assessment in which they did not show proficiency.
Gradebook impact	Original and reassessment scores will be averaged in the gradebook.

MATERIALS:

- As provided by the course.

EXPECTATIONS OF STUDENTS:

- Be Tech and Learning Ready: Come prepared with all necessary materials, including your charged device and any required software.
- Prioritize Safety: Follow all safety guidelines and procedures, especially when working with tools, equipment, or hazardous materials.
- Participate Actively: Engage in class discussions, ask questions, and contribute to group projects. Actively participate in lab activities by following instructions, working collaboratively, and cleaning up your workspace.
- Respect the Digital Realm: Treat all digital resources and equipment with care. Avoid actions that could harm or disrupt the learning environment.
- Embrace Digital Citizenship: Use technology ethically and responsibly. Be mindful of copyright laws and online etiquette.

EXTRA HELP:

- Students should seek out extra help when needed. The teacher is available for extra help before and after school as well as during prep periods.