

# Networking I

Syllabus | 2020-2021 | #520021 - One Credit



**Instructor:** Carmanita Monroe **Email:** [cmonroe@bessk12.org](mailto:cmonroe@bessk12.org) **Phone:** 205-432-3777

## COURSE DESCRIPTION:

Networking I is a one-credit advanced Information Technology course designed for students with prior knowledge in the areas of computer hardware, operating systems, and computer software applications. This course provides students with additional skills necessary to effectively plan, develop, and administer both a wired and wireless local area network (LAN). Topics addressed in this course include network operating systems, network architectures, network protocols, and emerging technologies.

**PREREQUISITES:** None **CAREER CLUSTER:** Information Technology

**COURSE FEE:** \$40 **CAREER PROGRAM:** Networking & Computer Services

### LAB APPLICATION:

TestOut LabSim: Network Pro  
Students will access this through Schoology

### WEBSITE:

Links to all course technologies will be available on the Bessemer Center for Technology website here:  
<https://bessemer.bcst.schoolinsites.com/>

### TEXTBOOK:

Jill West; Tamara Dean; Jean Andrews, *Network+ Guide to Networks, 8<sup>th</sup> Edition*. Cengage, MindTap.

### EMAIL:

All students are required to use their school email to access the course technologies we will use.

## GENERAL SUPPLIES:

- Notebook
- Pencil (Mechanical or Standard)
- Highlighters

**ADDITIONAL RECOMMENDED SUPPLIES:** These supplies would be used to organize lessons, fact sheets, and lab printouts from TestOut LabSim to use for test preparation and as a reference in an IT career.

- 5" or 6" Three-Ring Binder
- Dividers
- Sheet Protectors
- College ruled filler paper

## CAREER AND TECHNICAL STUDENT ORGANIZATION (CTSO):

SkillsUSA - \$15 Membership Fee (included in Course Fee)

All Networking I students are required to join and participate in SkillsUSA. SkillsUSA is a professional organization that is designed to be run by students as an integral, co-curricular component of career and technical courses. SkillsUSA members develop leadership abilities, expand workplace-readiness skills, and broaden opportunities for professional growth. Through chapter meetings, contests, leadership conferences, and activities, students will build these skills. Each chapter chooses plans and conducts its operations.

## AVAILABLE INDUSTRY CREDENTIALS:

TestOut Network Pro

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## GRADING AND EVALUATION CRITERIA:

**Assessments:** Grades will be based on quizzes, midterm, and final examinations. Exams are cumulative and given in a variety of formats. An in-class review will be held before each exam.

**Classwork:** Grades will be based on keyword terms, review questions, critical thinking, weekly objectives, projects, labs, bell ringers, etc.

**Miscellaneous:** Grades will be based on homework, bonuses, etc.

The following scale will be used in assessing the student’s content knowledge and skills during the course:

<u>EVALUATION CRITERIA:</u>	<u>PERCENTAGE:</u>	<u>GRADING SCALE:</u>	<u>LETTER GRADE:</u>
Assessments	50	100 – 90	A
Classwork/Participation	40	89 – 80	B
Miscellaneous	10	79 – 70	C
<b>TOTAL</b>	<b>100</b>	69 – 60	D
		Below 59	F

## CLASS POLICIES:

1. Eating and drinking are NOT permitted in the computer lab or classroom.
2. Students are not to tamper with computers in any way nor to make changes in setup unless directed by the instructor. Any students performing unauthorized actions on computers will be subject to disciplinary action.
3. Sufficient time will be allowed in the classroom to complete the work assigned.
4. Students must leave the work area clean, neat, and ready for the next class. Also, students are to return any textbooks to the book bin and shut down the computer before leaving the classroom.
5. School policies will be followed.

## MAKE-UP POLICY:

You are responsible for informing the instructor within one week after you return that you need to make up assignments or tests. Failure to do so will result in a zero being assigned for the missed work.

## COURSE GOALS:

1. Describe the purpose and function of personal computers, including software applications and Internet applications.
2. Explain digital representations of common forms of data. Examples: binary, hexadecimal
3. Demonstrate the process of installing, verifying, and upgrading computer components.
4. Determine appropriate components and peripheral devices to meet networking requirements.
5. Explain how communication occurs across a local Ethernet network.
6. Describe access layer devices and communication methods on a local Ethernet network.
7. Differentiate between client and server interaction.
8. Describe various components and structures of a wireless local area network (LAN).
9. Analyze wired and wireless networks for common hardware and connection issues.
10. Utilize the troubleshooting process to identify and solve common problems with a LAN.
  - a. Interacting with the computer help desk
  - b. Utilizing a bottom-up or top-down troubleshooting methodology
11. Describe the purpose of a layered model to illustrate the interaction of various protocols.
12. Utilize mathematics skills to design a LAN.

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13. Describe the process of using and connecting to an Internet Service Provider (ISP).
14. Compare various methods of obtaining an Internet Protocol (IP) address.
15. Describe applications of Network Address Translation (NAT) on a home or small business network.
16. Evaluate wireless security issues and mitigation strategies for improved security
17. Utilize research results to determine ways to improve network security, including evaluating current network threats and methods of attack.
18. Describe attack mitigation strategies and different security applications.
19. Determine career and entrepreneurial opportunities, responsibilities, and educational and credentialing requirements related to networking professions.

## ESSENTIAL QUESTIONS:

- Why was a binary number system chosen to represent computer language?
- Why would we use a personal computer?
- How has digitalization impacted your life?
- How do companies use networks outside of the office?
- What is the purpose for being a part of a network?
- What other networks can you think of that don't involve computers?
- In what ways are layered or modular approaches used in Internetworking?
- How much should a company invest in security?
- What are the dominant jobs within the region?
- How do you evaluate degree/experience/certification employment requirements?
- How important is your skill level?

## COURSE OUTLINE:

- I. **Computer Basics**
  - A. Computer usage and benefits
  - B. How do computers meet a need
  - C. Digital Math 101
  - D. Identifying PC components
  - E. PC Safety Guidelines
  - F. Computer composition (look and feel)
  - G. PC assembly (from bare-bones to functionality)
- II. **Networking**
  - A. Networking Requirements
  - B. Establishing a connection
  - C. Data-links
  - D. Client/Server vs. Peer-to-peer
  - E. Selecting LAN/WAN Components
  - F. Common Data-Flow Issues
  - G. Troubleshooting practice

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## III. System Design

- A. Layered Models
- B. LAN Fundamentals
- C. Broadcast and Collision Domains
- D. Data-Link Layer
- E. WAN Fundamentals
- F. Address Allocation
- G. NAT

## IV. Security

- A. WLAN Security Issues
- B. Risk Mitigation Tools
- C. Security Standards

## V. Career Opportunities

- A. Career Opportunities
- B. Job Types
- C. Network Analyst
- D. Network Technician
- E. Technical Support
- F. Helpdesk Technician
- G. Network Specialist
- H. Technical Writer
- I. Job Demand by Industry
- J. Educational
- K. Legal
- L. Financial
- M. Government
- N. Non-Profit
- O. Automotive
- P. Communications
- Q. Health
- R. Roles Responsibilities
- S. Administration
- T. Personnel Management
- U. Documentation
- V. Supervision
- W. Travel
- X. Working Independently
- Y. Customer Facing
- Z. Time Management
- AA. Accountability
- BB. Availability
- CC. Professional Credentials
- DD. Certificates of Completion

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- EE. Associate Degree
- FF. 4+ year Degrees
- GG. Industry Certifications
- HH. Work Experience
- II. Career Pathways
- JJ. Interests
- KK. Self-Discipline
- LL. Options

## **CULMINATING PRODUCTS:**

1. Demonstration. Students design and assemble a personal computer based on the requirements for average home usage
2. Students will determine minimum organizational network requirements and develop a price list to meet those requirements
3. Students will design a small network and configure communications protocols covered within the unit.
4. Students will write a research paper covering ways to reduce vulnerabilities to wired and wireless networks.
5. Students are required to dress business professional during mock interviews conducted during class and at competitions.