

Hudson County Community College

STEM DIVISION

Course Title: Introduction to networks & Networking Concepts Credits: 3

Course Number: CSC 240

Prerequisite: CSC 227

Co-requisite: CSC 101 or CSC 111 or CSC 115 or CSC 117

INSTRUCTOR:

OFFICE HOURS: TBD

EMAIL ADDRESS:

LOCATION:

PHONE:

Course Outline and description:

Topics include but not limited:

The course is structured to let students demonstrate an understanding of the protocols and applications of the Internet.

This Course provides students with the basic concepts of network computing, the seven layers of the Open System Interconnection (OSI) Model, Institute for Electrical and Electronics Engineering (IEEE) 802 networking model, and the benefits of various protocols.

This course introduces basic elements of modern computer and telecommunication networks. A hybrid five-layer reference model resembling the popular TCP/IP model will be discussed.

Students will understand peer-to-peer and server-based networks, and their differences. They will become familiar with various networking topologies and how to select the best network topology for an environment. Students will learn how to install and configure NetWare TCP/IP software, how to use common TCP/IP applications, and how to troubleshoot common problems that may occur in a TCP/IP environment.

This course also provides the background information needed in preparation for network management and certification.

The inhouse or virtual laboratory portion of the course reinforces topics covered in lecture by enabling students to learn how configure and troubleshoot network problems

Outcome/Objective :

Upon completion this course student will be able to:

1. Demonstrate the fundamental and traditional Computer Networking concepts.
2. Illustrate an overall picture of computer networking in general and the Internet in particular.
3. Describe how various networking components (hardware/software) work and where they belong in the 5-layer protocol stack.
4. Identify the types of communications Networks in the business world and in the networks field.
5. To select the best network design, hardware, and software for any network environment
6. Build a network from scratch and maintain, upgrade, and troubleshoot an existing network.

7. Take and pass CompTIA's (the Computing Technology Industry Association's) Network+ certification exam.

Detailed outline of suggested topics:

Session	Topic	Lab and or Homework
1	Introduction Networking Topologies The OSI Model The Ethernet LAN Home Networking Assembling an Office LAN	The OSI Model
2	Structured Cabling Unshielded Twisted-Pair Cable Terminating Cat6/5e UTP Cables Cable Testing and Certification 10G Ethernet over Copper	TCP/IP Utilities
3	The Nature of Light Fiber Attenuation and Dispersion Optical Components Fiber Connections and Splices Optical Networking Architectures Optical Ethernet Campus Issues – Building + Backbone Wide Area Networking Safety	TCP/IP Protocols - The Core Protocols
4	EXAM 1 The IEEE 802.11 Wireless LAN Standard Wireless Networking Bluetooth, WiMAX, and RFID Securing Wireless LANs Configuring a Point-to-Multi-point Wireless	Select a topic for the final Project TCP/IP Protocols - Other Key Protocols Agree on Project's topic
5	The TCP/IP Layers Number Conversion IPv4 Addressing Subnet Masks CIDR Blocks Introduction to IPv6	Follow up on project's progress IPv4 vs IPv6 – Calculating, Configuring and Testing

6	<p>The Network Bridge The Network Switch The Router Interconnecting the LANs with the Router Configuring the Network Interface – Auto-negotiation</p>	
7	Mid Term Exam	
8	<p>Router Fundamentals The Console Port Connection The Router’s User EXEC Mode The Router’s Privileged EXEC Mode</p>	<p>Follow up on project’s progress</p> <p>Closing Ports and Unnecessary Services</p>
9	<p>Introduction to VLANs Introduction to Switch Configuration the Spanning Tree Protocol Network Management Power over Ethernet</p>	<p>Follow up on project’s progress</p> <p>Implementing NAT and Allowing Remote Access</p>
10	<p>Introduction Static Routing Dynamic Routing Protocols Distance Vector Link-State Protocols Distance Vector Protocols Link State Protocols Hybrid Protocols Configuring RIP v2</p>	<p>Follow up on project’s progress</p> <p>Configuring Port Redirection</p>
11	<p>The Line Connection Remote Access Metro Ethernet/Carrier Ethernet Network Services – DNS and DHCP Internet Routing – BGP Analyzing Internet Data Traffic</p>	<p>Follow up on project’s progress</p> <p>Remote Access – RDP (homework)</p>

12	<p>Introduction</p> <p>Analyzing Computer Networks – WireShark Protocol Analyzer</p> <p>Analyzing Computer Networks – FTP Data Packets</p> <p>Analyzing Campus Network Data Traffic</p> <p>Troubleshooting the Router Interface</p> <p>Troubleshooting the Switch Interface</p> <p>Troubleshooting Fiber Optics – the OTDR</p>	<p>Network Troubleshooting</p> <p>Finalize term paper and PPT for the project</p>
13		
14	<p>Intrusion (How an Attacker Gains Control of a Network)</p> <p>Denial of Service</p> <p>Introduction to Security Software and Hardware</p> <p>Introduction to the Virtual Private Network (VPN)</p>	<p>Exploiting Wireless Security</p> <p>Network Security – Firewalls</p> <p>Project presentation</p>
15	<p>Network management</p> <p>Isolated corporate LANs and VLANs</p> <p>Connections to public data networks (PDNs)</p> <p>Public data networks (PDNs)</p> <p>Privately owned and operated WANs</p> <p>Provide public access and charge fees for connection services</p> <p>Commonly used by corporations to extend the reach of their own networks</p>	<p>Network Management</p> <p>Business Continuity - Disaster Recovery</p> <p>Project presentation</p>
16	Test III (Final Exam)	

Evaluation Criteria

Student will be graded based on:

- Exam I (Lecture) 15%
- Exam II (Midterm / Lecture) 15%
- Exam III (Final /Lecture) 15%
- Weekly Labs 30%
- Research Article Presentation: 15%
- Homework assignments and collaborative work: 10%

**homework assignments include but not limited to watching selected related YouTube videos or published articles and writing short essays.*

Grading Policy:

95 to 100	A	90 to 94	A-	85 to 89	B+	80 to 84	B
75 to 79	B-	70 to 74	C+	65 to 69	C	64 to 60	F

- ** Excess of absence will result in a failing grade!! (3 Absences maximum).
- ** 20 minutes of lateness is considered one absence.
- There will be no makeup for missing tests.
- Any student misses a class for any reason is responsible for the notes and assignments given on the day he/she missed.

Academic Integrity Standards:

Academic integrity is central to the pursuit of education. For students at HCCC, this means maintaining the highest ethical standards in completing their academic work. In doing so, students earn college credits by their honest efforts. When they are awarded a certificate or degree, they have attained a goal representing genuine achievement and can reflect with pride on their accomplishment. This is what gives college education its essential value.

Violations of the principle of academic integrity include:

- Cheating on exams.
- Reporting false research data or experimental results.
- Allowing other students to copy one's work to submit to instructors.
- Communicating the contents of an exam to other students who will be taking the same test.
- Submitting the same project in more than one course, without discussing this first with instructors.
- Submitting plagiarized work. Plagiarism is the use of another writer's words or ideas without properly crediting that person. This unacknowledged use may be from published books or articles, the Internet, or another student's work.

When students act dishonestly in meeting their course requirements, they lower the value of education for all students. Students who violate the college's policy on academic integrity are subject to failing grades on exams or projects, or for the entire course. In some cases, serious or repeated instances of academic integrity violations may warrant further disciplinary action.

Disability Support Services :

Students with disabilities who believe that they might need accommodations in this class are encouraged to contact the Disability Support Services at 201-360-4157 as soon as possible to better ensure that such assistance can be implemented in a timely fashion. All disabilities must be documented by a qualified professional such as a physician, licensed learning disability teacher (LDTC), psychologist, psychiatric nurse, licensed social worker or licensed professional counselor, who is qualified to assess the

disability that the student claims to have and note recommendations on accommodations for the student. All information provided to the Disability Support Services Program will be confidential between the program, professors involved with the student, and the individual student.

Required Textbook:

Networking essentials
Fourth Edition
Jeffery S. Beasley
Piyasat Nilkaew
ISBN 13:978-0-7897-4903-1
ISBN-10: 0-7897-4903-3

Reference Textbook:

Computer Networks and Communications
M. Barry Dumas
Morris Schwartz
ISBN-13: 978-0-7897-5819-4
ISBN-10 0-7897-5819-9

Student Classroom Recording Policy

- Hudson County Community College prohibits the audio-visual recording, transmission, and distribution of classroom sessions. Classes may only be recorded with the advance written permission of the instructor. The Hudson County Community College classroom recording policy must be listed in all syllabi.
- All classroom recordings can only be used for academic purposes by students enrolled in that class. Recordings may not be shared, reproduced, or uploaded to public websites or other mediums, and these recordings may contain copyrighted material and are prohibited from any form of commercial use.
- All students and guests must be informed that the class may be recorded. Due to issues related to privacy and the possible inhibition of student participation, instructors should be mindful of the effects of permitting classroom recording.
- Instructors should retain electronic or paper copies of their written consent to grant classroom recordings.
- Students must destroy their recordings at the end of the semester.
- Students who are granted permission to record their class by the office of Disability Support Services should inform the instructor beforehand and are subject to the policies outlined in this document.
- Violation of this policy is subject to disciplinary action listed under the code of conduct as included in the Student Handbook.