COURSE OUTLINE: NASA101 - NETWORK ESSENTIALS

Prepared: Sam Laitinen
Approved: Corey Meunier, Dean, Technology, Trades, and Apprenticeship

Course Code: Title	NASA101: NETWORKING ESSENTIALS AND MANAGEMENT
Program Number: Name	2196: NETWRK ARCH & SEC AN
Department:	COMPUTER STUDIES
Academic Year:	2023-2024
Course Description:	Computers use common communication protocols over digital interconnections to connect with each other. In today`s technology driven environment end users just want to get work done and networking is an integral part of that effort. This course focuses on the network protocols and devices that enable them to function and how they are used to transmit data between senders and receivers.
Total Credits:	4
Hours/Week:	4
Total Hours:	56
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
This course is a pre-requisite for:	NASA207
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**2196 - NETWRK ARCH & SEC AN** VLO 1 Design an enterprise network by applying knowledge of networking and routing protocols. VLO 3 Develop a security architecture plan to incorporate both perimeter and endpoint security controls and devices to provide layers of security.
Essential Employability Skills (EES) addressed in this course:	EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication. EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others. EES 9 Interact with others in groups or teams that contribute to effective working

	relationships and the achievement of goals. EES 10 Manage the use of time and other resources to complete projects. EES 11 Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	Passing Grade: 50%, A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Other Course Evaluation & Assessment Requirements:	A+ = 90-100% A = 80-89% B = 70-79% C = 60-69% D = 50-59% F < 50% Students are expected to be present to write all tests in class, unless otherwise specified. If a student is unable to write a test due to illness or a legitimate emergency, that student must contact the professor prior to class and provide reasoning. Should the student fail to contact the professor, the student shall receive a grade of zero on the test. If a student is not present 10 minutes after the test begins, the student will be considered absent and will not be given the privilege of writing the test. Students exhibiting academic dishonesty during a test will receive an automatic zero. Please refer to the College Academic Dishonesty Policy for further information. In order to qualify to write a missed test, the student shall have: a.) attended at least 75% of the classes to-date. b.) provide the professor an acceptable explanation for his/her absence. c.) be granted permission by the professor. NOTE: The missed test that has met the above criteria will be an end-of-semester test. Labs / assignments are due on the due-date indicated by the professor. Notice by the professor will be written on the labs / assignments and verbally announced in the class. Labs and assignments that are deemed late will have the following penalty: 1 day late - 10% reduction, 2 days late, 20% reduction, 3 days late, 30% reduction. After 3 days, no late assignments and labs will be accepted. It is the responsibility of the student who has missed a class to contact the professor immediately to obtain the lab / assignment. Students are responsible for doing their own work. Labs / assignments that are handed in and are deemed identical or near identical in content may constitute academic dishonesty and result in a zero grade. Students are expected to be present to write in-classroom quizzes. There are no make-up options for missed in-class quizzes. Students have the right to learn in an environment that is distraction-free, therefore, everyone is expected to arrive on-time in class. Should lectures become distracted due to students walking in late, the professor may deny entry until the 1st break period, which is 50 minutes into the class or until that component of the lecture is complete. The total overall average of test scores combined must be 50% or higher in order to qualify to pass this course. In addition, combined tests, Labs / Assignments total grade must be 50% or higher.

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Explain the basics of how communication occurs on the Internetwork and how this relate to the OSI Model	• Describe the Internetworking basics • Identify the components used in networking including routers, switches, and hubs • Describe the OSI Model and how it relates to networking • Describe how the functions of the three upper OSI model layers provide network services to end user applications • Describe how the TCP/IP Application Layer protocols provide the services specified by the upper layers of the OSI model. • Define how people use the Application Layer to communicate across the information network
Course Outcome 2	**Learning Objectives for Course Outcome 2**
Explain Ethernet Networking and Data Encapsulations	• Describe the concepts of a collision and broadcast domains. • Describe communication over Ethernet and how it relate to Data Link and Physical Layer. • Describe the variety of Ethernet cabling • Describe the Three Layer Cisco Hierarchical model • Use available resources to create Ethernet cabling
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Explain the TCP/IP (DOD) Layer Model and IP Addressing	• Describe the Process/Application Layer protocols • Describe the Transport Layer protocols • Describe the Internet Layer protocols • Define IPV4 addressing and Types
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Describe the role of Subnetting in the Network Environment	• Explain how to create Subnets to manage network resources • Define and use Subnet Masks in a network environment • Define Classless Inter-Domain Routing (CIDR). • Use available resources to Subnet Class A, B, and C addresses
Course Outcome 5	**Learning Objectives for Course Outcome 5**
Explain VLSMs, Summarization, and Troubleshooting TCP/IP	• Define Variable Length Subnet Masks and implantation in a network environment. • Examine Summarization. • Discuss troubleshooting TCP/IP and resolve IP address problems .
Course Outcome 6	**Learning Objectives for Course Outcome 6**
Explore and use the Cisco`s Internetworking Operating System (IOS)	• Explore and define the Cisco IOS Interface. • Determine the process of entering and using the Cisco Command Line Interface • Discuss Administrative configurations. • Explore the process of viewing, editing, and saving configurations on a Cisco Device.

Course Outcome 7	Learning Objectives for Course Outcome 7
Explore managing a Cisco Internetwork	• Examine the internal components of a router and switch. • Describe the process of backing up and restoring a Cisco configuration. • Explore the process of configuring DHCP on a Cisco Router • Discuss the NTP (Network Time protocol) • Explore the process of using Telnet to connect to Cisco Devices • Discuss the process of resolving hostnames • Explore Network Troubleshooting including the use of ping, traceroute, and process commands
Course Outcome 8	**Learning Objectives for Course Outcome 8**
Explore Managing a Cisco Device	• Describe the process of managing the configuration registers. • Explore backing up and restoring the Cisco IOS • Explore upgrading the Cisco IOS.
Course Outcome 9	**Learning Objectives for Course Outcome 9**
Explore the process of IP Routing	• Explain routing basics • Describe the IP Routing Process • Configure IP Routing on a Cisco Router
Course Outcome 10	**Learning Objectives for Course Outcome 10**
Discuss and explore Layer 2 Switching	• Define switch functions available at Layer 2 • Configure a Catalyst Switch and verify its operation • Discuss Port Security.
Course Outcome 11	**Learning Objectives for Course Outcome 11**
Discuss and configure Virtual LANs	• Define the role of Virtual LAN in a network environment • Explore the process of configuring a virtual LAN on a Cisco Switch • Discuss Inter-VLAN routing.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Labs	30%
Quizzes	10%
Test #1	30%
Test #2	30%

Date: August 21, 2023

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.