



## COURSE OUTLINE: NASA204 - VIRTUAL PRIVATE NET

Prepared: Sam Laitinen

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	NASA204: VIRTUAL PRIVATE NETWORKS
<b>Program Number: Name</b>	2196: NETWRK ARCH & SEC AN
<b>Department:</b>	COMPUTER STUDIES
<b>Semesters/Terms:</b>	21W
<b>Course Description:</b>	This course will examine the use of virtual private network (VPN) technologies to provide secure communications, and the implementation and configuration of VPN technologies. The course explores site-to-site and multi-site VPN solutions using firewalls and routers, as well as several remote-access VPN solutions.
<b>Total Credits:</b>	4
<b>Hours/Week:</b>	4
<b>Total Hours:</b>	60
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Vocational Learning Outcomes (VLO's) addressed in this course:</b>	<b>2196 - NETWRK ARCH &amp; SEC AN</b>
Please refer to program web page for a complete listing of program outcomes where applicable.	VLO 7 Deploy servers to host web applications, focusing on securing the server and web from identified security risks.
<b>Essential Employability Skills (EES) addressed in this course:</b>	<p>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.</p> <p>EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>EES 3 Execute mathematical operations accurately.</p> <p>EES 4 Apply a systematic approach to solve problems.</p> <p>EES 5 Use a variety of thinking skills to anticipate and solve problems.</p> <p>EES 6 Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.</p> <p>EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</p> <p>EES 10 Manage the use of time and other resources to complete projects.</p> <p>EES 11 Take responsibility for ones own actions, decisions, and consequences.</p>

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2020-2021 academic year.



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<b>Course Evaluation:</b>	<p>Passing Grade: 50%,</p> <p>A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.</p>																
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	<p>NOTE: You must obtain a minimum mark of 50% in both the Theory portion and the Lab portion of the course. Failing to do so, will result in an overall failing grade (F).</p> <p>The professor reserves the right to adjust the mark up or down based on attendance, participation, leadership, creativity and whether there is an improving trend.</p> <ul style="list-style-type: none"> <li>• Students must complete and pass both the test and lab portion of the course in order to pass the entire course.</li> <li>• All Assignments must be completed satisfactorily to complete the course.</li> <li>• A minimum of 80% attendance required in the lectures and labs.</li> <li>• Makeup Tests are at the discretion of the instructor and will be assigned a maximum grade of 50%.</li> <li>• The professor reserves the right to adjust the number of tests, practical tests and quizzes based on unforeseen circumstances. The students will be given sufficient notice to any changes and the reasons thereof.</li> <li>• A student who is absent for 3 or more times without any valid reason or effort to resolve the problem will result in action taken.</li> </ul> <p>NOTE: If action is to be taken, it will range from marks being deducted to a maximum of removal from the course.</p>																
<b>Course Outcomes and Learning Objectives:</b>	<table border="1"> <tr> <th data-bbox="505 765 802 803">Course Outcome 1</th><th data-bbox="802 765 1448 803">Learning Objectives for Course Outcome 1</th></tr> <tr> <td data-bbox="505 803 802 994">Develop an understanding of Information Security</td><td data-bbox="802 803 1448 994"> <ul style="list-style-type: none"> <li>• Describe the basics of Information Security</li> <li>• Reive examples of Network Infrastructures and Related Security Concerns</li> <li>• Enhancing the Security of Wired Versus Wireless LAN Infrastructures</li> <li>• Examine Common Network Security Components Used to Mitigate Threats</li> </ul> </td></tr> <tr> <th data-bbox="505 994 802 1032">Course Outcome 2</th><th data-bbox="802 994 1448 1032">Learning Objectives for Course Outcome 2</th></tr> <tr> <td data-bbox="505 1032 802 1168">Develop an understanding of Firewall Fundamentals</td><td data-bbox="802 1032 1448 1168"> <ul style="list-style-type: none"> <li>• Describe the purpose of a Firewall.</li> <li>• Examine both software and hardware firewalls available</li> <li>• Determine when a Firewall is needed</li> <li>• Discuss how Firewalls work and what they do</li> <li>• Review TCP/IP Fundamentals</li> </ul> </td></tr> <tr> <th data-bbox="505 1168 802 1206">Course Outcome 3</th><th data-bbox="802 1168 1448 1206">Learning Objectives for Course Outcome 3</th></tr> <tr> <td data-bbox="505 1206 802 1321">Review VPN Fundamentals</td><td data-bbox="802 1206 1448 1321"> <ul style="list-style-type: none"> <li>• Describe the purpose of a Virtual Private Network</li> <li>• Examine benefits of deploying a VPN</li> <li>• Examine the Relationship Between Encryption and VPNs</li> <li>• Review types of VPN authentication</li> </ul> </td></tr> <tr> <th data-bbox="505 1321 802 1359">Course Outcome 4</th><th data-bbox="802 1321 1448 1359">Learning Objectives for Course Outcome 4</th></tr> <tr> <td data-bbox="505 1359 802 1446">Examine Network Security Threats and Issues</td><td data-bbox="802 1359 1448 1446"> <ul style="list-style-type: none"> <li>• Review Hacker threats and motivation</li> <li>• Examine Threats from Internal Personnel and External Entities</li> </ul> </td></tr> </table>	Course Outcome 1	Learning Objectives for Course Outcome 1	Develop an understanding of Information Security	<ul style="list-style-type: none"> <li>• Describe the basics of Information Security</li> <li>• Reive examples of Network Infrastructures and Related Security Concerns</li> <li>• Enhancing the Security of Wired Versus Wireless LAN Infrastructures</li> <li>• Examine Common Network Security Components Used to Mitigate Threats</li> </ul>	Course Outcome 2	Learning Objectives for Course Outcome 2	Develop an understanding of Firewall Fundamentals	<ul style="list-style-type: none"> <li>• Describe the purpose of a Firewall.</li> <li>• Examine both software and hardware firewalls available</li> <li>• Determine when a Firewall is needed</li> <li>• Discuss how Firewalls work and what they do</li> <li>• Review TCP/IP Fundamentals</li> </ul>	Course Outcome 3	Learning Objectives for Course Outcome 3	Review VPN Fundamentals	<ul style="list-style-type: none"> <li>• Describe the purpose of a Virtual Private Network</li> <li>• Examine benefits of deploying a VPN</li> <li>• Examine the Relationship Between Encryption and VPNs</li> <li>• Review types of VPN authentication</li> </ul>	Course Outcome 4	Learning Objectives for Course Outcome 4	Examine Network Security Threats and Issues	<ul style="list-style-type: none"> <li>• Review Hacker threats and motivation</li> <li>• Examine Threats from Internal Personnel and External Entities</li> </ul>
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	<ul style="list-style-type: none"> <li>• Review types of attacks</li> <li>• Examine varied threats over wired and wireless networks</li> </ul>
<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>
Review Implementing Network Security	<ul style="list-style-type: none"> <li>• Discuss Network Design and Defense in Depth</li> <li>• Discuss Authentication, Authorization, and Accounting</li> <li>• Examine Hosts: Local-Only or Remote and Mobile as related to VPNs</li> </ul>
<b>Course Outcome 6</b>	<b>Learning Objectives for Course Outcome 6</b>
Explore Network Security Management Best Practices	<ul style="list-style-type: none"> <li>• Discuss Fail-Secure, Fail-Open, and Fail-Close Options</li> <li>• Examine Physical vs Virtual Security</li> <li>• Example Securing the VPN</li> <li>• Review the Security Checklist</li> </ul>
<b>Course Outcome 7</b>	<b>Learning Objectives for Course Outcome 7</b>
Review Firewall Basics	<ul style="list-style-type: none"> <li>• Discuss Firewall Rules</li> <li>• Review Authentication, Authorization, and Accounting</li> <li>• Discuss Monitoring and Logging</li> <li>• Review Limitations of Firewalls</li> <li>• Discuss The Downside of Encryption with Firewalls</li> <li>• Review various Management Interfaces</li> </ul>
<b>Course Outcome 8</b>	<b>Learning Objectives for Course Outcome 8</b>
Explore Firewall Deployment Considerations	<ul style="list-style-type: none"> <li>• Discuss What Should You Allow and What Should You Block</li> <li>• Discuss Essential Elements of a Firewall Policy</li> <li>• Evaluating Needs and Solutions in Designing Security</li> </ul>
<b>Course Outcome 9</b>	<b>Learning Objectives for Course Outcome 9</b>
Explore Firewall Management and Security	<ul style="list-style-type: none"> <li>• Best Practices for Firewall Management</li> <li>• Security Measures in Addition to a Firewall</li> <li>• Testing Firewall Security</li> <li>• Proper Firewall Implementation Procedure</li> </ul>
<b>Course Outcome 10</b>	<b>Learning Objectives for Course Outcome 10</b>
Explore Using Common Firewalls	<ul style="list-style-type: none"> <li>• Uses for a Host Software Firewall</li> <li>• Examples of Software Firewall Products</li> <li>• Discuss Simple Firewall Techniques</li> </ul>
<b>Course Outcome 11</b>	<b>Learning Objectives for Course Outcome 11</b>
Examine VPN Management Best Practice	<ul style="list-style-type: none"> <li>• Examine Developing a VPN Policy</li> <li>• Explore Developing a VPN Deployment Plan</li> <li>• Discuss VPN Threats and Exploits</li> <li>• Commercial or Open Source VPNs</li> <li>• Review Differences Between Personal and Enterprise VPNs</li> <li>• Discuss VPN Troubleshooting</li> </ul>
<b>Course Outcome 12</b>	<b>Learning Objectives for Course Outcome 12</b>
Explore VPN Technologies	<ul style="list-style-type: none"> <li>• Examine Differences Between Software and Hardware Solutions</li> <li>• Examine Software VPNs</li> </ul>

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		<ul style="list-style-type: none"><li>• Examine Hardware VPNs</li><li>• Review Differences Between Layer 2 and Layer 3 VPNs</li><li>• Review Internet Protocol Security (IPSec)</li><li>• Review Layer 2 Tunneling Protocol (L2TP)</li><li>• Examine VPN and Virtualization</li></ul>
	<b>Course Outcome 13</b>	<b>Learning Objectives for Course Outcome 13</b>
	Explore Real World VPN Scenarios	<ul style="list-style-type: none"><li>• Examine Operating System-Based VPNs</li><li>• Examine VPN Appliances</li><li>• Discuss choosing Between IPSec and SSL Remote Access VPNs</li><li>• Review DMZ, Extranet, and Intranet VPN Solutions</li></ul>

<b>Evaluation Process and Grading System:</b>	<table><tr><th>Evaluation Type</th><th>Evaluation Weight</th></tr><tr><td>Attendance and Assignments</td><td>10%</td></tr><tr><td>Labs</td><td>30%</td></tr><tr><td>Quizzes</td><td>10%</td></tr><tr><td>Tests</td><td>50%</td></tr></table>	Evaluation Type	Evaluation Weight	Attendance and Assignments	10%	Labs	30%	Quizzes	10%	Tests	50%
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<b>Date:</b>	January 7, 2021										
<b>Addendum:</b>	Please refer to the course outline addendum on the Learning Management System for further information.										

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