NOTE: This course is not designed for transfer credit.

Catalog Course Description:

This course is a practical, comprehensive solution to designing, deploying, and maintaining network defenses for the HPC clusters. It discusses perimeter components, such as firewalls, VPNs, routers, and intrusion detection systems, and it explains how to integrate them into a unified whole to meet real-world business requirements.

Entry Level Standards:

College level reading and math skills; keyboarding skills of at least 20 wpm; familiarity with HPC architecture and related internetworking issues; problem solving and analytical skills also important.

Prerequisites:

HPC 1010 (NETW 2530) or consent of instructor

Textbook(s) and Other Course Materials:


I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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</table>
| 1    | Network Security and Firewalls  
Lesson 1: What Is Security? |
| 2    | Lesson 2: Elements of Security  
Lesson 3: Applied Encryption |
| 3    | Lesson 4: Types of Attacks  
Lesson 5: General Security Principles |
| 4    | Lesson 6: Protocol Layers and Security  
Lesson 7: Securing Resources |
| 5    | Lesson 8: Firewalls, and Virtual Private Networks. |
II. Course Objectives*:

A. Develop a working understanding of the terminology and hardware devices associated with HPC intrusion detection. I, II, IV

B. Demonstrate basic fundamentals of HPC packet filtering security concepts. I, III

C. Demonstrate applied principles of installing, configuring, and managing perimeter security devices. I, II, III

D. Exhibit a knowledge of security threats and HPC VPN security systems. I, II, IV

E. Exhibit a knowledge of HPC log analysis security software. I, II, IV, V

F. Develop an understanding of the technologies to combat HPC troubleshooting security threats. II, IV, V

*Roman numerals after course objectives reference goals of the HPC program.

III. Instructional Processes*:

Students will:

1. Use router security configuration utilities to perform practical tasks for secure High Performance Computing. Technological Literacy Outcome, Information Literacy Outcome
2. Solve problems in perimeter computer security within HPC. *Active Learning Strategy*

3. Use professionally accepted methods and materials in completion of cluster defense components. *Technological Literacy Outcome*

4. Use the Internet as a medium for obtaining documentation and instruction. *Information Literacy Outcome, Technological Literacy Outcome*

5. Use the Computer-Based Training for obtaining instruction. *Transitional Strategy*

6. Prepare, review, and study documents for distribution to all class members via E-mail. *Technological Literacy Outcome*

7. Practice elements of the work ethic such as punctuality, professionalism, dependability, cooperation, and contribution. *Active Learning Strategy*

*Strategies and outcomes listed after instructional processes reference TBR's goals for strengthening general education knowledge and skills, connecting course work to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*:

Upon successful completion of this course, the student should be able to:

1. Use terminology associated with intrusion detection fields as related to HPC architecture. A,B,C,D,E,F

2. Use perimeter security hardware, DOS. A,B,C,D,E

3. Log-on/boot-up, operate, communicate, and use HPC security lab system. A,B,D,E

4. Use internal and external security countermeasures. D

5. Prove proficiency in the creation of security models for host defense of the HPC cluster. B, D

6. Load and run software products and facilities available on the system. A,B,C,D,E,F

7. Transfer data files from one HPC cluster to another using VPN integration. C

8. Produce documentation of methods used to secure HPC clusters. B,C,D,E

9. Illustrate an understanding of host hardening, separating resources, and perimeter design. A, C, F

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

A. Testing Procedures: Unit exams and security lab exercises will be averaged for the overall grade. Teamwork may increase or decrease that total by 10%. Unexcused absences during exams may not be retaken.

B. Laboratory Expectations:
Hands-on learning activities done individually and in teams will also serve as the basis for course evaluation.

C. Field Work:

N/A

D. Other Evaluation Methods:

Other assessment activities may consist of special projects, research papers, team activities, essays, short answer documents, or other work assigned.

E. Grading Scale:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90 - 100%</td>
<td>A</td>
</tr>
<tr>
<td>80 - 89%</td>
<td>B</td>
</tr>
<tr>
<td>70 - 79%</td>
<td>C</td>
</tr>
<tr>
<td>60 - 69%</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 60%</td>
<td>F</td>
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</tbody>
</table>

VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled required instructional activities. As a minimum, students in all courses MUST BE PRESENT for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course (Pellissippi State Catalog).

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices: Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments. In addition to other possible disciplinary sanctions that may be imposed as a result of academic misconduct, the instructor has the authority to assign either (1) an F or zero for the assignment or (2) an F for the course.

C. Accommodations for disabilities:

If you need accommodation because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please inform the instructor immediately. Privately after class or in the instructor's office.

To request accommodations students must register with Services for Students with Disabilities: Goins 127 or 131, Phone: (865) 539-7153 or (865) 694-6751 Voice/TDD.