

CYBERSECURITY

CERTIFICATE - 30 CREDITS

About this program

This certificate is designed for individuals looking to add technical skills in IT security. A person earning this certificate will develop skills to manage and secure the Linux operating system, develop and query an information database, and create simple scripts. Areas of cybersecurity focus include vulnerability assessment, penetration testing, perimeter defense, incident response and applying security measures to reduce risk of a security breach.

Program outcomes

1. Analyze known security incidents to trace and document the steps in the incident.
2. Use mechanisms available in an operating system to control access to resources.
3. Construct input validation.
4. Install and configure firewall rules based on business policies.
5. Investigate various countermeasures and security controls to minimize risk and exposure.
6. Examine ethical issues related to cybersecurity.
7. Demonstrate the use of proper SQL commands to retrieve specific data from a database.
8. Use protocol analyzers to identify information encapsulated in a data packet.
9. Write scripts to perform specific functions within a host and networked computing environment.

Curriculum overview

Crds	Requirement type
30	Required courses
30	Total

Developmental courses note: A student may be required to enroll in developmental courses in reading, writing and math. A student's scores on the Accuplacer assessment will determine enrollment in developmental courses. The purpose of developmental courses is to prepare students for the demands of a college-level curriculum. *Credits may vary.*

Accreditation: Minnesota State Community and Technical College is accredited by the Higher Learning Commission, a regional accreditation agency recognized by the U.S. Department of Education. The Higher Learning Commission 230 South LaSalle Street, Suite 7-500 Chicago, IL 60604-1411 <http://www.ncahigherlearningcommission.org> Phone: 312.263.0456 / 800.621.7440

Curriculum requirement details

Required courses

Other requirements or restricted electives

Course	Crds
CPTR1001 - Introduction To Programming and Scripting	3
CPTR1040 - Introduction to Programming Logic	3
CPTR1108 - CISCO 1	3
CPTR1118 - CISCO 2	3
CPTR2224 - Linux I	3
CPTR2234 - Linux II	3
CPTR2240 - Database Administration	3
CSEC1110 - Fundamentals of IT Security	3
CSEC2210 - Security Breaches and Countermeasures	3
CSEC2228 - Network Defense	3

Course summaries

CPTR1001 - Introduction To Programming and Scripting (3 credits)
 This course is an introduction to computer programming. Emphasis will be on programming concepts, program design methodology, program debugging, problem solving and writing clear code.

CPTR1040 - Introduction to Programming Logic (3 credits)
 This course introduces students to computer programming logic and troubleshooting. Students are introduced to algorithm development and structure programming. These concepts are foundational to learning to program and general troubleshooting.

CPTR1108 - CISCO 1 (3 credits)
 This is an introduction to networks course that covers the architecture, structure, functions and components of the Internet and other computer networks. Students achieve a basic understanding of how networks operate while building simple local area networks (LANs). Students perform basic configurations for routers and switches and implement Internet Protocol.

CPTR1118 - CISCO 2 (3 credits)
 This course covers the architecture, components and operations of routers and switches in small networks and introduces wireless local area networks (WLANs) and security concepts. Students learn how to configure and troubleshoot routers and switches for advanced functionality using security best practices and resolve common issues with protocols in both Internet Protocol Version 4 (IPv4) and Internet Protocol Version 6 (IPv6) networks.

Prerequisites:

- CPTR1108

CPTR2224 - Linux I (3 credits)
 This course deals with Linux installation, configuration and system administration. This course lays the groundwork for continued study of Linux.

CPTR2234 - Linux II (3 credits)
 The primary focus of this course is Linux networking, security, ethics and privacy.

Prerequisites:

- CPTR2224

CPTR2240 - Database Administration (3 credits)
 Students in this course will identify core database concepts and create database models. Installation, configuration and maintenance of a database management system (DBMS) will be covered. Students will analyze and administer a database's performance optimization. Additional topics will include user administration within the database, backup and restoration, and database normalization.

Prerequisites:

- CPTR1040

OR

- CPTR1001

CSEC1110 - Fundamentals of IT Security (3 credits)
 Security is an important component of information technology. This course introduces industry-recommended security guidelines and controls. Students will practice implementing several examples of controls and encrypting data in transit and for storage.

CSEC2210 - Security Breaches and Countermeasures (3 credits)
 This course introduces the student to the various methodologies for attacking a network. The student will be introduced to concepts, principles and techniques, supplemented by hands-on exercises for attacking and disabling a network. The course will emphasize network attack methodologies with the emphasis on student use of network attack techniques and tools.

Prerequisites:

- CPTR2236

OR

- CSEC1110

CSEC2228 - Network Defense **(3 credits)**

This course introduces students to the various methodologies for defending the information technology network infrastructure. Students will be introduced to the concepts, principles, type and topologies of firewalls to include packet filtering, proxy firewalls, application gateways, circuit gateways and stateful inspection.

Prerequisites:

- CSEC1110

OR

- CPTR2236



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Program Plan — "Primary"

Locations: Moorhead, Online

1st Fall Term (9 credits)

Courses

Course	Crds
CPTR1040 - Introduction to Programming Logic	3
CPTR1108 - CISCO 1	3
CPTR2224 - Linux I	3

1st Spring Term (6 credits)

Courses

Course	Crds
CPTR1118 - CISCO 2	3
CSEC1110 - Fundamentals of IT Security	3

2nd Fall Term (9 credits)

Courses

Course	Crds
CPTR1001 - Introduction To Programming and Scripting	3
CPTR2234 - Linux II	3
CPTR2240 - Database Administration	3

2nd Spring Term (6 credits)

Courses

Course	Crds
CSEC2210 - Security Breaches and Countermeasures ...	3
CSEC2228 - Network Defense	3