College of Engineering, Design and Computing
UNIVERSITY OF COLORADO DENVER

Cybersecurity

Bachelor of Science (B.S.) – Catalog Year 2023-2024

Program Overview

The Cybersecurity professional is an individual that must be prepared to apply his or her knowledge and skills for online security in order to defense computers, servers, mobile devices, electronic systems, networks, users and data from malicious attacks. The Bachelor of Science in cybersecurity at CU Denver will prepare students for careers in security engineering, security analysis, cybersecurity law, security architecture, cybersecurity sales, secure web development, secure system development and many other diverse careers that rely on cybersecurity as a form of protection and preparation.

The Program Educational Objectives of the undergraduate cybersecurity program are to produce graduates who:

- Analyze a complex computing and security problem and apply algorithmic reasoning to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing and security requirements.
- Communicate and function effectively in professional contexts and teams.
- Make informed judgements in computing and security practices based on legal and ethical principles
- Apply security principles and practices to maintain operations in the presence of threats.

Academic Advising

Advising in the College of Engineering, Design and Computing (CEDC) depends on your student standing—undergraduate students either are pre-engineering or are admitted to the college, depending on degree progress. *Students admitted to the College of Engineering, Design and Computing (CEDC) who have declared a major are required to meet with an advisor in their specific department and should contact that department to schedule an appointment.*

Computer Science & Engineering
computerscience@ucdenver.edu
Visit the department website here
Lawrence Street Center, 8th Floor, 303-315-1408

General Graduation Requirements & Policies

All CU Denver CEDC Cybersecurity students are required to complete the following minimum general graduation requirements:

1. Complete a minimum of 120 semester hours
2. Achieve a minimum 2.0 CU cumulative grade point average (GPA)
3. Complete all college and major requirements
4. Residency: complete a minimum of 30 CEDC hours as a declared CEDC student in good standing at CUDenver
5. Terminal Residency: complete at least the final two semesters as an enrolled CEDC student

Program Requirements & Policies

Students are responsible for meeting with the faculty advisor in their department to confirm major requirements. Students completing the Cybersecurity B.S. Degree are required to complete the following minimum program requirements:

1. Complete 24 semester hours of CU Denver Core Curriculum coursework.
2. Complete 7 credit (at minimum) hours of math (Calculus I and Statistics)
3. Complete 8 credit hours of natural or physical sciences
4. Complete 31 credit hours of core computer science courses
5. Complete 32 credit hours of core cybersecurity courses
6. Complete 15 credit hours of cybersecurity breadth electives
7. Complete 3 credit hours of engineering design

Courses	Credits	Notes
* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information. *		
Required CU Denver Core Curriculum Coursework	24	See requirements here
Required Engineering Design Courses	3	
ENGR 1200 Fundamentals of Engineering Design Innovation	3	
Required Computer Science Core Courses	31	
CSCI 1410 Fundamentals of Computing	3	*Prerequisite: Freshman status, Co-Requisite: CSCI 1411
CSCI 1411 Fundamentals of Computing Lab	1	*Prerequisite: Freshman status, Co-Requisite: CSCI 1410
CSCI 1510 Logic Design	3	
CSCI 2312 Object Oriented Programming	3	*Prerequisite: CSCI 1410 & 1411
CSCI 2421 Data Structures & Program Design	3	*Prerequisite: CSCI 2312
CSCI 2511 Discrete Structures	3	*Prerequisite: MATH 1401
CSCI 2525 Assembly Language	3	*Prerequisite: CSCI 1510 & 2312
CSCI 3287 Database Systems	3	*Prerequisite: CSCI 2421 & ENGL 1020
CSCI 3412 Algorithms	3	*Prerequisite: CSCI 2421 & 2511
CSCI 3453 Operating Systems Concepts	3	*Prerequisite: CSCI 2525 & 3412
CSCI 3761 Intro to Networks	3	*Prerequisite: CSCI 2421
Required Cybersecurity Core Courses	32	
CSCY 2930 Practical System Administration	2	*Prerequisite: CSCI 1410 &1411
CSCY 3740 Computer Security	3	*Prerequisite: CSCI 2421
CSCY 3765 Secure Network & Systems Programming	3	*Prerequisite: CSCI 3761
CSCY 4407 Security & Cryptography	3	*Prerequisite: CSCI 3412
CSCY 4741 Principles of Cybersecurity	3	*Prerequisite: CSCI 3287 & 3761
CSCY 4742 Cybersecurity Programming & Analysis	3	*Prerequisite: CSCY 3740 & CSCI 3761

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CSCY 4743 Cyber & Infrastructure Defense	3	**Prerequisite: CSCI 3761*
CSCY 4738 Senior Design Project I	3	**Prerequisite: CSCI 3453 & CSCY 4741, 4742, & 4743*
CSCY 4739 Senior Design Project II	3	**Prerequisite: CSCY 4738*
CSCY 4772 Mobile & IoT Security	3	**Prerequisite: CSCI 3761 & 3453*
CSCY 4950 Cybersecurity Risk Analysis & Management	3	**Prerequisite: CSCY 3740 & CSCI 3761*
Required Mathematics	7	
MATH 1401 Calculus I	4	**Prerequisite: (MATH 1120 or 1130) or placement exam*
MATH 2830 Introductory Statistics	3	**Prerequisite: MATH 1401*
Required Science	8	
2 Natural or Physical Sciences with lab (for science majors) with ENGR 1300 Chemistry for Engineers as a choice		
Cybersecurity Technical Electives See handbook for additional information	15	*Check individual courses for prerequisites*

Sample Academic Plan of Study

The following academic plan is a *sample* pathway to completing degree requirements for this major. Students should tailor this plan based on previously completed college coursework (e.g., AP, IB, CLEP, dual/concurrent enrollment, and transfer credit), course availability, and individual preferences related to course load, schedules, or add-on programs such as minors or double-majors. Students deviating from this plan must fulfill course prerequisites and must meet with their assigned advisor to confirm degree requirements.

CSCI 3287 DATABASE SYSTEMS

Year One	Semester 1	CRS	Semester 2	CRS
	CSCI 1410 FUNDAMENTALS OF COMPUTING	3	CSCI 1510 LOGIC DESIGN	3
	CSCI 1411 FUNDAMENTALS OF COMPUTING LAB	1	CSCI 2312 OBJECT ORIENTED PROGRAMMING	3
	MATH 1401 CALCULUS I	4	CSCI 2511 DISCRETE STRUCTURES	3
	ENGR 1200 FUND OF ENGINEERING DESIGN INNOVATION	3	CSCY 2930 PRACTICAL SYSTEMS ADMINISTRATION	2
	ENGL 1020 CORE COMPOSITION I	3	ENGL 2030 CORE COMPOSITION II	3

Year Two	Semester 3	CRS	Semester 4	CRS
	CSCI 2421 DATA STRUCTURES & PROGRAM DESIGN	3	CSCI 3287 DATABASE SYSTEMS	3
	CSCI 2525 ASSEMBLY LANGUAGE	3	CSCI 3761 INTRODUCTION TO COMPUTER NETWORKS	3
	MATH 2830 INTRODUCTORY STATISTICS	3	CSCY 3740 COMPUTER SECURITY	3
	CORE CURRICULUM CHOICE	3	CORE CURRICULUM CHOICE	3
	SCIENCE CHOICE	3-4	SCIENCE CHOICE	3-4
	SCIENCE CHOICE LAB	1	SCIENCE CHOICE LAB	1

Year Three	Semester 5	CRS	Semester 6	CRS
	CSCI 3412 ALGORITHMS	3	CSCI 3453 OPERATING SYSTEMS	3
	CSCY 3765 SECURE NETWORK & SYSTEMS PROGRAMMING	3	CSCY 4742 CYBERSECURITY PROG. & ANALYSIS	3
	CSCY 4741 PRINCIPLES OF CYBERSECURITY	3	CSCY 4743 CYBER & INFRASTRUCTURE DEFENSE	3
	CYBERSECURITY TECHNICAL ELECTIVE	3	CYBERSECURITY TECHNICAL ELECTIVE	3
	ENGR 3400 CORE CURR. CULTURAL DIVERSITY	3	ENGR 3600 CORE CURR. INT'L PERSPECTIVES	3

Year Four	Semester 7	CRS	Semester 8	CRS
	CSCY 4738 SENIOR DESIGN I (Security focused projects)	3	CSCY 4407 SECURITY & CRYPTOGRAPHY	3
	CSCY 4772 MOBILE & IOT SECURITY	3	CSCY 4739 SENIOR DESIGN II	3
	CYBERSECURITY TECHNICAL ELECTIVE	3	CSCY 4950 CYBERSECURITY RISK ANALYSIS & MANAGEMENT	3
	CYBERSECURITY TECHNICAL ELECTIVE	3	CORE CURRICULUM CHOICE	3
	CORE CURRICULUM CHOICE	3	CYBERSECURITY TECHNICAL ELECTIVE	3