

Bachelor of Science in Cybersecurity

This program prepares students who have a strong interest related to the fields of Cybersecurity related to Software, Data, and Network Security.

Admission Requirements

All of the general UND requirements for undergraduate enrollment, participation, and completion of a degree shall be required.

Degree Requirements

Required curriculum (123 credits):

Code	Title	Credits
Required 123 Credits including:		
I. Essential Studies Requirements (see University ES listing)		
II. Programming Fundamentals (8 credits):		
CSCI 160	Computer Science I	4
CSCI 161	Computer Science II	4
III. Digital Fundamentals (4 credits):		
EE 111	Digital Circuits	3
EE 111L	Digital Circuits Laboratory	1
IV. Software, Database, and Network Security Core (54 credits):		
CSCI 166	Tools and Techniques of Computing Practice	3
CSCI 242	Algorithms and Data Structures	3
CSCI 250	Assembly Language (Assembly Language)	3
CSCI 265	Introduction to Programming Languages	3
CSCI 327	Data Communications	3
CSCI 330	Systems Programming	3
CSCI 370	Computer Architecture	4
CSCI 384	Artificial Intelligence	3
CSCI 371	Exploit Analysis and Development (Exploit Analysis and Development)	3
CSCI 372	Introduction to Secure Software Engineering (Introduction to Secure Software Engineering)	3
CSCI 389	Computer and Network Security	3
CYBR 397	Cyber Practicum (Cybersecurity Practicum)	2
CSCI 451	Operating Systems I	3
CSCI 455	Database Management Systems (or ISBA 410: Information Security)	3
CSCI 471	Fundamentals of Penetration Testing (Fundamentals of Penetration Testing)	3
CSCI 475	Cyber Physical Systems Component Security (Cyber Physical Systems & Component Security)	3
CYBR 491	Cyber Capstone I (Cyber Capstone I)	3
CYBR 492	Cyber Capstone II (Cyber Capstone II)	3
V. Requirements outside of the College of Engineering and Mines		
MATH 165	Calculus I	4
MATH 166	Calculus II	4
MATH 207	Introduction to Linear Algebra	2
MATH 208	Discrete Mathematics	3
CJ 320	Cybersecurity Law and Investigations (Social Science)	3
PHIL 575	Data Science Ethics (PHIL 475, Humanities)	3
Approved probability/statistics elective		
3		
2 Approved laboratory science courses		
8		
VI. Cybersecurity Electives (Select 9 credits):		
CSCI 260	Advanced Programming Languages	3
CSCI 270	Programming for Data Science	3
CSCI 280	Object Oriented Programming	3

CSCI 290	Cyber-Security and Information Assurance	3
CSCI 346	Introduction to Data Visualization	3
CSCI 363	User Interface Design	3
CSCI 364	Concurrent and Distributed Programming	3
CSCI 365	Organization of Programming Languages	3
CSCI 427	Cloud Computing	3
CSCI 435	Formal Languages and Automata	3
CSCI 443	Introduction to Machine Learning	3
CSCI 445	Mathematical Modeling and Simulation	3
CSCI 446	Computer Graphics I	3
CSCI 448	Computer Graphics II	3
CSCI 452	Operating Systems II	3
CSCI 456	Introduction to Data Mining	3
CSCI 465	Principles of Translation	3
MATH 265	Calculus III	4
MATH 266	Elementary Differential Equations	3
MATH 330	Proof, Set Theory, and Logic	3
MATH 408	Combinatorics	3
MATH 421	Statistical Theory I	3
MATH 422	Statistical Theory II	3
MATH 425	Cryptological Mathematics	3
MATH 431	Introduction to Analysis I	3
MATH 432	Introduction to Analysis II	3
MATH 435	Theory of Numbers	3
MATH 441	Abstract Algebra	3
MATH 442	Linear Algebra	3
MATH 461	Numerical Analysis	3
MATH 471	Introduction to Complex Variables	3
Graduate Level Electives:		
CSCI 551	Security for Cloud Computing	3
CSCI 555	Computer Networks	3
CSCI 557	Computer Forensics	3
CSCI 585	Vulnerability Assessment	3
CSCI 589	Application Layer Security	3
DATA 550	Data Security	3
EE 670	Analytical Foundations of Cyber Security	3
EE 671	Computing Foundations of Cyber Security	3
EE 672	Emerging Threats and Defenses	3
EE 673	Applied Cryptography	3
EE 623	Introduction to Smart Grid I	3
EE 624	Introduction to Smart Grid II	3
EE 674	Communication Protocols: OSI model and TCP/IP Protocol Stack	3
EE 673	Applied Cryptography	3
EE 675	Intrusion Detection Algorithms	3
EE 750	Internet of Things and Security	3
Total Credit Hours		123