Bachelor of Science in Cybersecurity Engineering

This program prepares students who have a strong interest in the fields of Cybersecurity related to Hardware Security, Operational Technology (OT) Security, and Cyber Informed Engineering (CIE).

Admission Requirements

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

Degree Requirements

Code	Title	Credits
Required 130 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. Hardware Security and Operational Technology Core (57 credits)		
CYBR 150	Introduction to Cybersecurity Engineering	3
EE 221	Electric Circuits I	3
EE 221L	Electric Circuits I Laboratory	1
CSCI 250	Assembly Language	3
EE 304	Computer Aided Measurement and Controls	3
EE 222	Electric Circuits II	3
EE 222L	Electric Circuits II Laboratory	1
EE 321	Electronics I	3
EE 321L	Electronics Laboratory I	1
CSCI 327	Data Communications	3
CSCI 371	Exploit Analysis and Development	3
CSCI 372	Introduction to Secure Software Engineering	3
CSCI 389	Computer and Network Security	3
CYBR 397	Cyber Practicum	2
EE 426	Engineering Systems Reliability	3
EE 312	Computer Hardware Organization	3
EE 211	Embedded Systems	3
CSCI 471	Fundamentals of Penetration Testing	3
CSCI 475	Cyber Physical Systems Component Security	3
CYBR 491	Cyber Capstone I	3
CYBR 492	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
MATH 265	Calculus III	4
MATH 266	Elementary Differential Equations	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 6 credits):		
CSCI 242	Algorithms and Data Structures	3
CSCI 260	Advanced Programming Languages	3
CSCI 265	Introduction to 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 330	Systems Programming	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 370	Computer Architecture	4
CSCI 384	Artificial Intelligence	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 451	Operating Systems I	3
CSCI 452	Operating Systems II	3
CSCI 455	Database Management Systems	3
CSCI 456	Introduction to Data Mining	3
EE 360	Signals and Systems	3
EE 301	Electric Drives	3
EE 350	Fundamentals of Controls	3
EE 441	Communications Engineering	3
EE 322	Electronics II	3
EE 402	Power Systems I	3
EE 424	Electronic Circuits	3
EE 457	Robotics Fundamentals	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 675	Intrusion Detection Algorithms	3
EE 750	Internet of Things and Security	3
Total Credit Hours		**130**