

# BACHELOR OF SCIENCE IN COMPUTER AND CYBERSECURITY ENGINEERING

The Bachelor of Science in Computer and Cybersecurity Engineering (CCSE) is a degree program that prepares students for an engineering career that involves design and application of secure and resilient computer hardware and software systems. This is a unique program that combines computer engineering and cybersecurity topics into one major. The program emphasizes the cybersecurity engineering of cyber-physical systems which are becoming more prevalent every day. It is concerned with detection and elimination of vulnerabilities and the safe operation of the Internet of Things, cloud computing, healthcare, smart/micro grid power systems, computer networks, and wireless communications.

## Required Courses

Code	Title	Credit Hours
<b>Computer and Cyber Security Engineering Requirements</b>		<b>(47)</b>
ECE 100	Intro to the Profession I	3
ECE 211	Circuit Analysis I	3
ECE 213	Circuit Analysis II	4
ECE 218	Digital Systems	4
ECE 242	Digital Computers&Computing	3
ECE 308	Signals Systems	3
ECE 311	Engineering Electronics	4
ECE 407	Intro Comp Ntwks with Lab	4
ECE 441	Microcomputers/Embedded Comp	4
ECE 442	Internet of Things/Cyber Phys	3
ECE 443	Intro Computer Cyber Security	3
or CS 458	Intro to Information Security	
ECE 444	Computer Network Security	3
ECE 485	Computer Organization & Design	3
or CS 470	Computer Architecture	
ECE 497	Special Problems <sup>1</sup>	3
<b>Computer Science Major Requirements</b>		<b>(16)</b>
CS 115	Object-Oriented Programming I	2
CS 116	Object-Oriented Programming II	2
CS 330	Discrete Structures	3
CS 331	Data Structures and Algorithms	3
CS 351	Systems Programming	3
CS 450	Operating Systems	3
<b>Software Engineering/Law Elective</b>		<b>(2-3)</b>
Select two to three credit hours from the following courses:		2-3
LAW 252	Law of Privacy	3
LAW 285	Cyber Fraud-Priv Class Actions	2
LAW 295	Data Privacy and Security	2
LAW 478	Computer & Network Privacy	3
<b>Mathematics Requirements</b>		<b>(24)</b>
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 251	Multivariate & Vector Calculus	4
MATH 252	Introduction to Diff Equations	4
MATH 333	Matrix Alg & Complex Variables	3
MATH 374	Probability/Statistics for ECE	3
<b>Physics Requirements</b>		<b>(11)</b>
PHYS 123	General Physics I: Mechanics	4
PHYS 221	Gen Physics II: Elect&Magntism	4

PHYS 224	Gen Physics III for Engrns	3
<b>Chemistry Requirement</b>		<b>(3)</b>
CHEM 122	Principles of Chem I w/out Lab	3
<b>Science Elective</b>		<b>(3)</b>
Select one of the following:		3
BIOL 105	Introduction to Biology	3
BIOL 114	Introduction to Human Biology	3
CHEM 126	Principles Chemistry II	3
MS 201	Materials Science	3
<b>Interprofessional Projects (IPRO)</b>		<b>(6)</b>
See Illinois Tech Core Curriculum, section E		6
<b>Humanities and Social Sciences Requirements</b>		<b>(21)</b>
See Illinois Tech Core Curriculum, sections B and C		21
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Total Credit Hours		133-134

**Minimum degree credits required: 133**

<sup>1</sup> ECE 497 with a project related to cyber security topics such as smart grid, Internet of Things, cloud computing, hardware security, or cryptography. Please see your academic adviser for more details.

## Bachelor of Science in Computer and Cybersecurity Engineering Curriculum

		Year 1	
Semester 1	Credit Hours	Semester 2	Credit Hours
ECE 100	3	MATH 152	5
MATH 151	5	PHYS 123	4
CHEM 122	3	CS 116	2
CS 115	2	Social Sciences Elective	3
Humanities 200-level Course	3	Science Elective <sup>1</sup>	3
		16	17
		Year 2	
Semester 1	Credit Hours	Semester 2	Credit Hours
MATH 252	4	MATH 251	4
PHYS 221	4	PHYS 224	3
ECE 211	3	ECE 213	4
ECE 218	4	ECE 242	3
CS 331	3	CS 330	3
		18	17
		Year 3	
Semester 1	Credit Hours	Semester 2	Credit Hours
ECE 308	3	CS 450	3
ECE 311	4	ECE 407	4
CS 351	3	MATH 374	3
MATH 333 or 350	3	I PRO Elective I	3
Humanities Elective (300+)	3	Social Sciences Elective (300+)	3
		16	16
		Year 4	
Semester 1	Credit Hours	Semester 2	Credit Hours
ECE 441	4	ECE 442	3
ECE 485 or CS 470	3	ECE 444	3
ECE 443 or CS 458	3	ECE 497 <sup>2</sup>	3
I PRO Elective II	3	Cyber Security Law Elective <sup>3</sup>	2-3
Humanities or Social Sciences Elective	3	Humanities Elective (300+)	3
		Social Sciences Elective (300+)	3
		16	17-18

Total Credit Hours: 133-134

<sup>1</sup> Science elective must be BIOL 105, BIOL 114, CHEM 126, or MS 201.

<sup>2</sup> ECE 497 with a project related to cyber security topics such as smart grid, Internet of Things, cloud computing, hardware security, or cryptography. Please see your academic adviser for more details.

<sup>3</sup> Choose from the following courses: LAW 252, LAW 285, LAW 295, or LAW 478.