

















# 2022 - 2023 Major Map



## Computer Science (Cybersecurity), BS





School/College: Ira A. Fulton Schools of Engineering  
ESCSEIBS

Term 1 0 - 15 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CSE 110: Principles of Programming (CS)	3	C	<ul style="list-style-type: none"><li>ASU 101 or college-specific equivalent First-Year Seminar required of all first-year students and should be taken in the first semester.</li><li>If ENG 105 is taken, a 3 credit hour elective must also be taken prior to graduation.</li><li>Prep for success using the <a href="#">First-Year Student Guide</a>.</li><li>Join a <a href="#">Fulton community</a>.</li><li>Explore <a href="#">engineering and technical professions</a>.</li></ul>
ASU 101-CSE: The ASU Experience	1		
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition	3	C	
FSE 100: Introduction to Engineering	2	C	
MAT 265: Calculus for Engineers I (MA)	3	C	
Social-Behavioral Sciences (SB) AND Global Awareness (G)	3		
 Complete Mathematics (MA) requirement.			
 Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	15		
Term 2 15 - 31 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CSE 205: Object-Oriented Programming and Data Structures (CS)	3	C	<ul style="list-style-type: none"><li>Three total (SQ) lab science courses are required. Two (SQ) courses must be from the same subject area and one (SQ) course must be from a different subject area.</li><li>Create a <a href="#">Handshake</a> profile.</li><li>Get involved with EPICS, the Generator Labs, and the <a href="#">Fulton Start-Up Center</a>.</li></ul>
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition	3	C	
MAT 266: Calculus for Engineers II (MA)	3	C	
Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)	3		
Natural Science - Quantitative (SQ)	4		
 Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
 Complete MAT 170 OR MAT 171 OR MAT 265 OR MAT 270 course(s).			
 Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	16		
Term 3 31 - 47 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes



 CSE 120: Digital Design Fundamentals	3	C
 CSE 240: Introduction to Programming Languages	3	C
 MAT 243: Discrete Mathematical Structures	3	C
MAT 267: Calculus for Engineers III (MA) OR CSE 259: Logic in Computer Science	3	C
Natural Science - Quantitative (SQ)	4	
 Complete MAT 266 OR MAT 271 course(s).		
 Complete First-Year Composition requirement.		
 Minimum 2.00 GPA ASU Cumulative.		
Complete Mathematics (MA) requirement.		
Term hours subtotal:	16	


- Three total (SQ) lab science courses are required. Two (SQ) courses must be from the same subject area and one (SQ) course must be from a different subject area.
- Prep for success using the [Sophomore Guide](#).

Term 4 47 - 63 Credit Hours  Critical course signified by 	Hours	Minimum Grade	Notes
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 CSE 230: Computer Organization and Assembly Language Programming	3	C
 CSE 310: Data Structures and Algorithms	3	C
Natural Science - Quantitative (SQ)	4	
Complete 2 courses: Elective	6	
 Complete CSE 259 OR MAT 267 OR MAT 272 course(s).		
 Minimum 2.00 GPA ASU Cumulative.		
Term hours subtotal:	16	

- Three total (SQ) lab science courses are required. Two (SQ) courses must be from the same subject area and one (SQ) course must be from a different subject area.
- Pursue an [undergraduate research experience](#).
- Apply for [internships](#).
- Attend [career fairs and events](#).

Term 5 63 - 79 Credit Hours  Necessary course signified by 	Hours	Minimum Grade	Notes
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 IEE 380: Probability and Statistics for Engineering Problem Solving (CS)	3	C
CSE 301: Computing Ethics	1	C
CSE 355: Introduction to Theoretical Computer Science	3	C
CSE 360: Introduction to Software Engineering	3	C
CSE 365: Information Assurance	3	C
Social-Behavioral Sciences (SB) AND Historical Awareness (H)	3	
Term hours subtotal:	16	

- Plan for success using the [Junior Guide](#).
- Network at [student organization](#) competitions or professional societies.

Term 6 79 - 94 Credit Hours  Necessary course signified by 	Hours	Minimum Grade	Notes
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★ CSE 330: Operating Systems	3	C
★ CSE 340: Principles of Programming Languages	3	C
CSE 412: Database Management OR CSE 434: Computer Networks OR CSE 445: Distributed Software Development	3	C
MAT 343: Applied Linear Algebra	3	C
Humanities, Arts and Design (HU)	3	
★ Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).		
Term hours subtotal:		15

- CSE 434 is a prerequisite for CSE 468 which is an option for the Cybersecurity Focus Courses requirement.
- Research and prepare for **graduate school**.
- Apply for an **engineering 4+1 program**.
- Develop a **professional profile online**.

Term 7 94 - 108 Credit Hours <b>Necessary course signified by</b> ★	Hours	Minimum Grade	Notes
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★ CSE 485: Computer Science Capstone Project I (L)	3	C
Upper Division Cybersecurity Elective	3	C
Upper Division Cybersecurity Focus Courses	3	C
Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)	3	
Elective	2	
Term hours subtotal:		14

- Plan for success using the **Senior Guide**.
- Use **Handshake** to apply for full-time positions.
- Complete an in person or virtual **practice interview**.

Term 8 108 - 120 Credit Hours <b>Necessary course signified by</b> ★	Hours	Minimum Grade	Notes
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★ CSE 486: Computer Science Capstone Project II (L)	3	C
Upper Division Cybersecurity Elective	3	C
Upper Division Cybersecurity Focus Courses	3	C
Upper Division Technical Elective	3	C
Term hours subtotal:		12

- Please see course lists below for Technical Electives. Contact CIDSE Advising or visit the **CIDSE website** for additional information.

- Technical Electives may require additional prerequisites.
- For additional information on major curriculum, please visit the **Computer Science Degree Requirements website** and the **Concentration Requirements website**.

Hide Course List(s)/Track Group(s)

Cybersecurity Focus Courses	Cybersecurity Electives	Technical Electives
CSE 466: Computer Systems Security	CSE 445: Distributed Software Development	AEE 415: Vibration Analysis

CSE 468: Computer Network Security or (CSE 468 requires CSE 434 as a prerequisite)	CSE 460: Software Analysis and Design	AEE 426: Design of Aerospace Structures
CSE 469: Computer and Network Forensics	CSE 463: Introduction to Human Computer Interaction	AEE 462: Space Vehicle Dynamics and Control
CSE 494: Artificial Intelligence for Cyber Security	CSE 464: Software Quality Assurance and Testing	AEE 463: Aircraft Propulsion
	CSE 466: Computer Systems Security	AEE 465: Rocket Propulsion
	CSE 468: Computer Network Security	AEE 468: Aircraft Systems Design
	CSE 469: Computer and Network Forensics	AEE 471: Computational Fluid Dynamics
	CSE 471: Introduction to Artificial Intelligence	AME 430: Mac Development for Media Arts
	CSE 494: Artificial Intelligence for Cyber Security	AME 435: Mobile Development
		BCH 361: Advanced Principles of Biochemistry
		BCH 461: General Biochemistry
		BCH 462: General Biochemistry
		BIO 340: General Genetics
		BIO 343: Genetic Engineering and Society (L)
		BIO 345: Evolution
		BME 350: Signals and Systems for Bioengineers
		BME 413: Biomedical Instrumentation (L)
		BME 416: Advanced Biomechanics
		BME 494: Applied Computational Behavioral Science
		CEE 412: Pavement Analysis and Design
		CEE 432: Developing Software for Engineering Applications
		CEE 440: Hydrology
		CEE 441: Water Resources Engineering
		CEE 452: Foundations
		CEE 462: Unit Operations in Environmental Engineering
		CEE 466: Urban Water System Design
		CEE 467: Environmental Microbiology
		CEE 474: Transportation Systems Planning
		CEE 475: Highway Geometric Design
		CEE 481: Civil Engineering Project Management
		CEE 483: Highway Materials, Construction, and Quality
		CEE 486: Integrated Civil Engineering Design (L)
		CHE 342: Introduction to Applied Chemical Thermodynamics
		CHE 432: Principles of Chemical Engineering Design

CHE 442: Introduction to Chemical Reactor Design
CHE 461: Process Dynamic Control (CS)
CHE 462: Process Design (L)
CHE 469: Air Quality Engineering
CHE 475: Biochemical Engineering
CIS 415: Big Data Analytics in Business
CPI 311: Game Engine Development
CPI 350: Evaluation of Informatics Systems
CPI 360: Decision Making and Problem Solving
CPI 411: Graphics for Games
CPI 460: Intelligent Interactive Instructional Systems
CPI 462: Design for Learning in Virtual Worlds
CSE 320: Design and Synthesis of Digital Hardware
CSE 325: Embedded Microprocessor Systems
CSE 335: Principles of Mobile Application Development
CSE 4** Elective
DAT 300: Mathematical Tools for Data Science
DAT 301: Exploring Data in R and Python
DAT 401: Statistical Modeling and Inference for Data Science
DAT 402: Machine Learning for Data Science
EEE 304: Signals and Systems II
EEE 333: Hardware Design Languages and Programmable Logic
EEE 350: Random Signal Analysis
EEE 335: Analog and Digital Circuits

Technical Electives continued
EEE 360: Energy Systems and Power Electronics
EEE 404: Real-Time DSP Systems
EEE 407: Digital Signal Processing
EEE 425: Digital Systems and Circuits
EEE 433: Analog Integrated Circuits
EEE 434: Quantum Mechanics for Engineers
EEE 435: Fundamentals of CMOS and MEMS

EEE 436: Fundamentals of Solid-State Devices
EEE 437: Optoelectronics
EEE 439: Semiconductor Facilities and Cleanroom Practices
EEE 443: Antennas for Wireless Communications
EEE 445: Microwaves
EEE 448: Fiber Optics
EEE 455: Communication Systems
EEE 459: Communication Networks
EEE 460: Nuclear Power Engineering
EEE 463: Electrical Power Plants
EEE 470: Electric Power Devices
EEE 471: Power System Analysis
EEE 473: Electrical Machinery
EEE 480: Feedback Systems
EEE 481: Computer-Controlled Systems
FSE 301: Entrepreneurship and Value Creation
FSE 394: Engineering for Humanity
FSE 404: EPICS Gold: EPICS in Action
IEE 376: Operations Research Deterministic Techniques/Applications
IEE 381: Lean Six Sigma Methodology
IEE 385: Engineering Statistics: Probability
IEE 412: Introduction to Financial Engineering
IEE 426: Operations Research in Healthcare
IEE 431: Engineering Administration (L)
IEE 456: Introduction to Systems Engineering
IEE 458: Project Management
IEE 461: Production Control
IEE 470: Stochastic Operations Research
IEE 474: Quality Control
IEE 475: Simulating Stochastic Systems (CS)
MAE 341: Mechanism Analysis and Design
MAE 404: Finite Elements in Engineering
MAE 417: System Dynamics and Control II
MAE 436: Combustion
MAE 455: Polymers and Composites

MAT Upper Division Elective

Except for: MAT 300, MAT 340, MAT 342,  
MAT 343 and MAT 485

MSE 335: Materials Kinetics

MEE 351: Manufacturing Processes

MEE 434: Internal Combustion Engines

MEE 446: Energy Systems Design II

MSE 415: Mathematical and Computer  
Methods in Materials (CS)

PHY 302: Mathematical Methods in  
Physics II

PHY 361: Introductory Modern Physics

PHY 462: Particle and Nuclear Physics

SER 421: Web-Based Applications

SER 422: Web Application Programming

SER 423: Mobile Systems

STP 421: Probability

STP 425: Stochastic Processes

STP 427: Mathematical Statistics

STP 429: Applied Regression (CS)

## Notes:

- First-Year Composition: All students are placed in ENG 101 unless submission of SAT, ACT, Accuplacer, IELTS, or TOEFL score, or college-level transfer credit or test credit equivalent to ASU's first-year composition course(s), determine otherwise. Students on Polytechnic, Downtown Phoenix and West Campuses are encouraged to complete the Directed Self-Placement survey to choose the first-year composition option they believe best suits their needs. Visit: <https://cisa.asu.edu/DSP>
- Mathematics Placement Assessment score determines placement in first mathematics course.

**Total Hours:** 120

**Upper Division Hours:** 45 minimum

**Major GPA:** 2.00 minimum

**Cumulative GPA:** 2.00 minimum

**Total hrs at ASU:** 30 minimum

**Hrs Resident Credit for**

**Academic Recognition:** 56 minimum

**Total Community College Hrs:** 64 maximum

## General University Requirements Legend

General Studies Core Requirements:

- Literacy and Critical Inquiry (L)
- Mathematical Studies (MA)
- Computer/Statistics/Quantitative Applications (CS)
- Humanities, Arts and Design (HU)
- Social-Behavioral Sciences (SB)
- Natural Science - Quantitative (SQ)
- Natural Science - General (SG)

General Studies Awareness Requirements:

- Cultural Diversity in the U.S. (C)
- Global Awareness (G)
- Historical Awareness (H)

First-Year Composition

General Studies designations listed next to courses on the major map were valid for the 2022 - 2023 academic year. Please refer to the course catalog for current General Studies designations at time of class registration. General Studies credit is applied according to the designation the course carries at the time the class is taken.