**Computer Science (Cybersecurity Concentration), BS**

**Bachelor of Science, 2020-21 Catalog Year**

**ESCSEIBS**

### Fall-1
- ENG 101 (3) 1st-Year Comp.
- FSE 100 (2) Intro to Engr.
- CSE 110 (3) Principles of Programming Java
- ASU 101 (1) ASU Experience
- MAT 265 (3) CALC I
- HU/SB (3) 15 HOURS

### Spring-2
- ENG 102 (3) 1st-Year Comp.
- CSE 205 (3) Object-Oriented Programming
- ASU 101 (1) ASU Experience
- MAT 266 (3) CALC II
- HU/SB (3) 16 HOURS

### Fall-3
- LAB SCI (4) Sequence Part 1 of 2 **
- CSE 120 (3) Digital Design
- CSE 240 (3) Programming Languages
- MAT 243 (3) Discrete Math
- MAT 267 (3) CALC III or CSE 259 (3) Logic in Comp Sci
- HU/SB (3) 16 HOURS

### Spring-4
- LAB SCI (4) Sequence Part 2 of 2 **
- CSE 230 (3) Comp. Org. & Assembly Lang. Programming
- CSE 310 (3) Data Struct. & Algorithms
- HU/SB (3) 16 HOURS

### Fall-5
- CSE 301 (1) Computing Ethics
- CSE 355 (3) Intro Theoretical Comp. Science
- MAT 343 (3) Applied Linear Algebra
- IEE 380 (3) Prob. & Statistics
- CS 412 (3) or CS 434 (3) **
- CSE 44S (3) **
- HU/SB (3) 16 HOURS

### Spring-6
- CSE 361 (1) Computing Ethics
- CSE 365 (3) Information Assurance
- CSE 330 (3) Operating Systems
- CSE 360 (3) Intro. Software Engineering
- MAT 343 (3) Applied Linear Algebra
- IEE 380 (3) Prob. & Statistics
- HU/SB (3) 15 HOURS

### Fall-7
- CSE 302 (1) Computing Ethics
- CSE 412 (3) or CSE 434 (3) **
- CSE 44S (3) **
- CSE 486 (3) Capstone II (L)
- HU/SB (3) 14 HOURS

### Spring-8
- CSE 301 (1) Computing Ethics
- CSE 412 (3) or CSE 434 (3) **
- CSE 44S (3) **
- CSE 486 (3) Capstone II (L)
- TECH ELECT (3)**
- HU/SB (3) 12 HOURS

**NOTES:**

**See CIDSE Advising Center or CIDSE Website** (http://cidse.engineering.asu.edu/degreerequirementsbscs/) **for approved technical electives, cybersecurity focus courses, cybersecurity electives, and approved lab science sequence courses.**

* CSE 340 and 434 require CSE 230 as an additional prerequisite.

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* All cybersecurity focus and elective courses have additional prerequisites including CSE 365 (CSE 468 also requires CSE 434). Please check the catalog for specific information.

* Shaded courses designate “Critical Requirements”

* Minimum “C” grade required in all CSE major courses

* Bolded courses are offered in specific terms only

* Prerequisite

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**Cultural**

**Global**

**Historical**
Term 1
FSE 100: Introduction to Engineering - Introduces the engineering design process; working in engineering teams; the profession of engineering; engineering models, written and oral technical communication skills.
MAT 265: Calculus for Engineers I - Limits and continuity, differential calculus of functions of one variable, introduction to integration. Not open to students with credit in MAT 270
ASU 101-CSE: The ASU Experience
ENG 101: First-Year Composition
HU/SB: Humanities, Fine Arts & Design or Social & Behavioral Sciences

Term 2
CSE 205: Object-Oriented Programming & Data Structures - Problem solving by programming with an object-oriented programming language. Introduces data structures. Overview of computer science topics.
MAT 266: Calculus for Engineers II - Methods of integration, applications of calculus, elements of analytic geometry, improper integrals, Taylor series
ENG 102: First-Year Composition
Lab Science Option: choose from BIO 181, GLG 101 & 103, GLG 110 & 111, CHM 113 or 114, OR PHY 121 & 122
HU/SB: Humanities, Fine Arts & Design or Social & Behavioral Sciences

Term 3
CSE 120: Digital Design Fundamentals - Number systems, conversion methods, binary and complement arithmetic, Boolean algebra, circuit minimization, ROMs, PLAs, flipflops, synchronous sequential circuits
CSE 240: Introduction to Programming Languages - Introduces the procedural (C/C++), applicative (LISP/Scheme), and declarative (Prolog) languages.
MAT 243: Discrete Mathematical Structures - Logic, sets, functions, elementary number theory and combinatorics, recursive algorithms, and mathematical reasoning, including induction. Emphasizes connections to computer science.
MAT 267: Calculus for Engineers III - Vector-valued functions of several variables, partial derivatives, multiple integration.
CSE 259: Logic in Computer Science - This course is a mathematically solid introduction to propositional logic, first order logic, logic programming, and their applications in computer science.
Lab Science: PHY 121/122 or PHY 131/132 or CHM 113 & 116 or GLG 101/103 & GLG 102/104 or BIO 181 & 182

Term 4
CSE 310: Data Structures and Algorithms - Advanced data structures and algorithms, including stacks, queues, trees (B, B+, AVL), and graphs. Searching for graphs, hashing, external sorting.
Lab Science: complete sequence from above
HU/SB: Humanities, Fine Arts & Design or Social & Behavioral Sciences
General Elective

Term 5
CSE 301: Computing Ethics - Ethics for computing majors: history of computing, intellectual property, privacy, ethical frameworks, professional ethical responsibilities, and risks of computer-based systems.
CSE 355: Introduction to Theoretical Computer Science - Introduces formal language theory and automata, Turing machines, decidability/undecidability, recursive function theory, and complexity theory.
CSE 360: Introduction to Software Engineering - Software life cycle models; project management, team development environments and methodologies; software architectures; quality assurance and standards; legal, ethical issues.
CSE 365: Information Assurance - Concepts of information assurance (IA): basic IA techniques, policies, risk management, administration, legal and ethics issues.
IEE 380: Probability and Statistics for Engineering Problem Solving - Applications-oriented course with computer-based experience using statistical software for formulating and solving engineering problems
HU/SB: Humanities, Fine Arts & Design or Social & Behavioral Sciences

Term 6
CSE 330: Operating Systems - Operating system structure and services, processor scheduling, concurrent processes, synchronization techniques, memory management, virtual memory, input/output, storage management, and file systems.
CSE 340: Principles of Programming Languages - Formal syntactic and semantic descriptions, compilation and implementation issues, and theoretical foundations for several programming paradigms.
CSE 412 Database Management - Introduces DBMS concepts. Data models and languages. Relational database theory. Database security/integrity and concurrency.
OR CSE 434 Computer Networks (Network architecture and protocols, principles of network applications, socket programming, flow and congestion control, switching and routing, link-layer technologies, traffic capture and analysis, security)
OR CSE 445 Distributed Software Development - Distributed system architectures and design, service-oriented computing, and frameworks for development of distributed applications and software components.
HU/SB: Upper Division Humanities, Fine Arts & Design or Social & Behavioral Sciences

Term 7
CSE 485: Computer Science Capstone Project I - First course in capstone sequence for computer science majors emphasizing development process, technical skills, team work, and communication.
Cybersecurity Focus Course: From list on DARS/major map
Cybersecurity Elective: From list on DARS/major map
General Elective (2 credits)

Term 8
CSE 486: Computer Science Capstone Project II - Second course in capstone sequence for computer science majors continuing the development process, technical skills, teamwork, and communication.
Cybersecurity Focus Course: From list on DARS/major map
Cybersecurity Elective: From list on DARS/major map
Technical Elective: From list on DARS/major map