**Computer Systems Engineering (Cybersecurity), BSE**

**Bachelor of Science in Engineering, 2020-2021 Catalog Year**

ESCSE/BSE

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<th>FALL-1</th>
<th>SPRING-2</th>
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<tr>
<td>ENG 101 (3) 1st-Year Comp.</td>
<td>ENG 102 (3) 1st-Year Comp.</td>
<td>PHY 121(3) and 122 (1) University Physics</td>
<td>PHY 131(3) and 132 (1) University Physics</td>
<td>EEE 202 (4) Circuits I</td>
<td>EEE 334 (4) Circuits II</td>
<td>MAT 343 (3) Applied Linear Algebra</td>
<td>Upper Division HU/SB (3)</td>
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<td>FSE 100 (2) Intro to Engin.</td>
<td>BIO 181 or 182 or CHM 113 or 114 (4)</td>
<td>MAT 243 (3) Discrete Math</td>
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<td>ASU 101 (1) ASU Exper.</td>
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<td>MAT 265 (3) CALC I</td>
<td>MAT 266 (3) CALC II</td>
<td>MAT 267 (3) CALC III</td>
<td>MAT 275 (3) Diff Equations</td>
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<td>CSE 110 (3) Principles of Programming Java</td>
<td>CSE 205 (3) Object-Oriented Programming</td>
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<td>CSE 220 (3) Programming for Comp. Engr</td>
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Notes:
- ** See CIDSE Advising Center or CIDSE Website (http://cidse.engineering.asu.edu/degreerequirementsbsecse/) for approved technical electives
- ‡ CSE 301 requires FSE 100 as an additional prerequisite
- + All upper-division CSE courses (including Tech Elective) require additional prerequisites. Please check the catalog for specific information.
- ± 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.
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 BIO181 or 182 or CHM 113 or 114
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

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.

PHY 121/122: University Physics I: Mechanics and laboratory-Kinematics; Newton’s laws; work, energy, momentum, conservation laws; dynamics of particles, solids, liquids, and fluids. Both PHY 121 and PHY 122 must be taken to secure SQ General Studies credit.

HU/SB: Humanities, Fine Arts & Design or Social & Behavioral Sciences

Term 4


PHY 131/132: University Physics II: Electricity and Magnetism and laboratory-Electric charge and current, electric and magnetic fields in vacuum and in materials, and induction. AC circuits, displacement current, and electromagnetic waves. Both PHY 131 and PHY 132 must be taken to secure SQ General Studies credit.

MAT 275: Modern Differential Equations-Introduces differential equations, theoretical and practical solution techniques. Applications. Problem solving using MATLAB.

HU/SB: Humanities, Fine Arts & Design or Social & Behavioral Sciences

Term 5
EEE 202; Circuits I-Principles for analyzing linear and nonlinear circuits. Uses SPICE and MATLAB. Design and measurement of linear analog electrical systems.

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 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.

EEE 320: Design and Synthesis of Digital Hardware-Design and synthesis of digital hardware with hardware description language, computer-aided design tools, and programmable devices.

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

Term 6

CSE 325: Embedded Microprocessor Systems-System-level programming and analysis of embedded microprocessors systems. Fundamental concepts of digital system design for embedded system applications.

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 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 ethical issues.

Term 7
CSE 423: Systems Capstone Project I-Development process: specification, design, implementation, evaluation, and testing with economic, social, and safety considerations. System communication and team skills enrichment.

CSE 434: Computer Networks-Distributed computing paradigms and technologies; distributed system architectures and design patterns, frameworks for development of distributed software components.


Cybersecurity Focus Course: From list on DARS/major map

CSE Technical Elective: From list on DARS/major map

HU/SB: Upper Division Humanities, Fine Arts & Design or Social & Behavioral Sciences

Term 8

CSE 424: Systems Capstone Project II-Continuation of capstone project started in CSE 423.

Cybersecurity Focus Course: From list on DARS/major map

CSE Technical Elective

HU/SB: Upper Division Humanities, Fine Arts & Design or Social & Behavioral Sciences