Computer Systems Engineering (Cybersecurity Concentration), BSE
Bachelor of Science in Engineering, 2014-2015 Catalog Year

Notes: See CIDSE Advising Center or CIDSE Website (http://cidse.engineering.asu.edu/degrierequirementsbsecse/) for approved technical electives and approved lab science sequence courses. Shaded courses designates critical requirements. Minimum ‘C’ grade required in all CSE courses.
+CSE 4XX courses require CSE 310 and/or 360 as prerequisites
Bolded courses are offered in specific terms only
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, flip-flops, 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, 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

**CSE 220: Programming for Computer Engineering** - Introduction to C/C++, systems programming, and concurrency.


**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.


**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.

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


**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 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.

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

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 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.

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

Term 7

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

**CSE 430: 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 465: Information Assurance** - Concepts of information assurance (IA); basic IA techniques, policies, risk management, administration, legal and ethics issues.

**Cybersecurity Core**

Term 8


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

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

**Cybersecurity Core**

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