Computer Science (Cybersecurity Concentration), BS
Bachelor of Science, 2018-2019 Catalog Year
ESCSEIBS

Notes: ** See CIDSE Advising Center or CIDSE Website (http://cidse.engineering.asu.edu/degreerequirementsbscse/) for approved technical electives and approved lab science sequence courses.
‡ CSE 301 requires FSE 100 as an additional prerequisite
# CSE 340 and CSE 434 require CSE 230 as an additional prerequisite
+ Cybersecurity Concentration and other GSE 4XX courses require CSE 310 and/or CSE 360 as a prerequisite.
Shaded courses designates critical requirements. Minimum 'C' grade required in all CSE major courses.
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 - 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/SC: 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/SC: 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 OR

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 & PHY 131/132 or CHM 113 & 116 or GLG 101/103 & GLG 102/104 or BIO 181 & 182

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

Term 4


CSE 240: Introduction to Programming Languages - Introduces the procedural (C/C++), applicable (LISP/Scheme), and declarative (Prolog) languages.


Lab Science: complete sequence from above

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

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 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 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

IA Core - 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

General Elective

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 355: Introduction to Theoretical Computer Science - Introduces formal language theory and automata, Turing machines, decidability/undecidability, recursive function theory, and complexity theory.

Technical Elective: Upper Division Technical Elective from list on DARS/major map

HU/SC: 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, teamwork, and communication.

CSE 466: Computer Systems Security - Countermeasures to attacks to computer systems from miscreants (or hackers) and basic topics of cryptography and network security.

CSE 468: Computer Network Security - Practical network security exposure and hands-on experience about basic concepts, case studies, and useful tools.

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

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.

CSE 469: Computer and Network Forensics - Identification, extraction, documentation, interpretation, and preservation of computer media for evidentiary purposes, file system forensics, and network forensics.

Cybersecurity Elective (choose from CSE 460, CSE 463 or CSE 471)

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