Computer Science (Software Engineering), BS
Bachelor of Science, 2019-2020 Catalog Year
ESCSEBS

FALL-1
ENG 101 (3)
1st-Year Comp.
FSE 100 (2)
Intro to Engr.
ASU 101 (1)
ASU Experience
MAT 265 (3)
CALC I
CSE 110 (3)
Principles of Programming Java

SPRING-2
ENG 102 (3)
1st-Year Comp.
MAT 266 (3)
CALC II
CSE 205 (3)
Object-Oriented Programming

FALL-3
**LAB SCI (4)
Sequence Part 1 of 2
MAT 267 (3)
CALC III or CSE 259 Logic in Comp Sci
MAT 243 (3)
Discrete Math
CSE 120 (3)
Digital Design
CSE 230 (3)
Comp. Org. & Assembly Lang. Programming

SPRING-4
**LAB SCI (4)
Sequence Part 2 of 2
MAT 343 (3)
Applied Linear Algebra
CSE 240 (3)
Programming Languages
CSE 230 (3)
Comp. Org. & Assembly Lang. Programming

FALL-5
CSE 365 (3)
Information Assurance
CSE 310 (3)
Data Struct. & Algorithms
CSE 310 (3)
Intro Theoretical Comp. Science

SPRING-6
CSE 360 (3)
Prin. Prog. Lang
CSE 360 (3)
Intro. Software Engineering
CSE 330 (3)
Operating Systems
CSE 330 (3)
Operating Systems

FALL-7
Upper Division
HU/SB (3)
CSE 301 (1)
Computing Ethics
CSE 340 (3)
Prin. Prog. Lang
CSE 485 (3)
Capstone I (L)

SPRING-8
CSE 355 (3)
Software Quality Assurance & Testing (F)
CSE 345 (3)
Dist. Software Engr.
CSE 486 (3)
Capstone II (L)
CSE 446 (3)
Software Integration Engr. (5)

Notes: ** See CIDSE Advising Center or CIDSE Website (http://cidse.engineering.asu.edu/degreerequirementsbcs/) for approved technical electives and approved lab science sequence courses.
† CSE 301 requires FSE 100 as an additional prerequisite
† CSE 340 requires CSE 230 as an additional prerequisite
‡ CSE 4XX courses require CSE 310 and/or 360 as prerequisites
+ Shaded courses designate critical requirements. Minimum “C” grade required in all CSE major courses
Bolded courses are offered in specific terms only

Prerequisite

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
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 CHM113 & 116 or GLG 101/103 & GLG 102/104 or BIO 181 & 182
HU/SB: Humanities, Fine Arts & Design or Social & Behavioral Sciences

Term 4
CSE 240: Introduction to Programming Languages - Introduces the procedural (C/C++), applicative (LISP/Scheme), and declarative (Prolog) languages.
Lab Science: complete sequence from above
HU/SB: Humanities, Fine Arts & Design or Social & Behavioral Sciences

Term 5
CSE 365: Information Assurance - Concepts of information assurance (IA); basic IA techniques, policies, risk management, administration, legal and ethics issues.
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.
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.
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: 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 464: Software Quality Assurance and Testing - Software quality assurance (SQA), software quality metrics, software configuration management, software verification and validation, reviews, inspections, understanding software testing process, functional testing, structural testing, model-based testing, integration, system, and regression testing techniques, software life cycle models and software testing, testing distributed software, bug management, and use of testing tools.
CSE 460: Software Analysis and Design - Object-oriented and structured analysis and design; software architecture and design patterns; component-based development; software safety and reliability.
Technical Elective - Upper Division Technical Elective from list on DARS/major map

General Elective (2 credit)

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 446: Software Integration Engineering - Software development using architecture design, composition, workflow, services, data resources, data representations, data management, and development tools.
Software Engineering Elective: Choose from CSE 463, CSE 466, CSE 467 or CSE 468
Technical Elective - Upper Division Technical Elective from list on DARS/major map