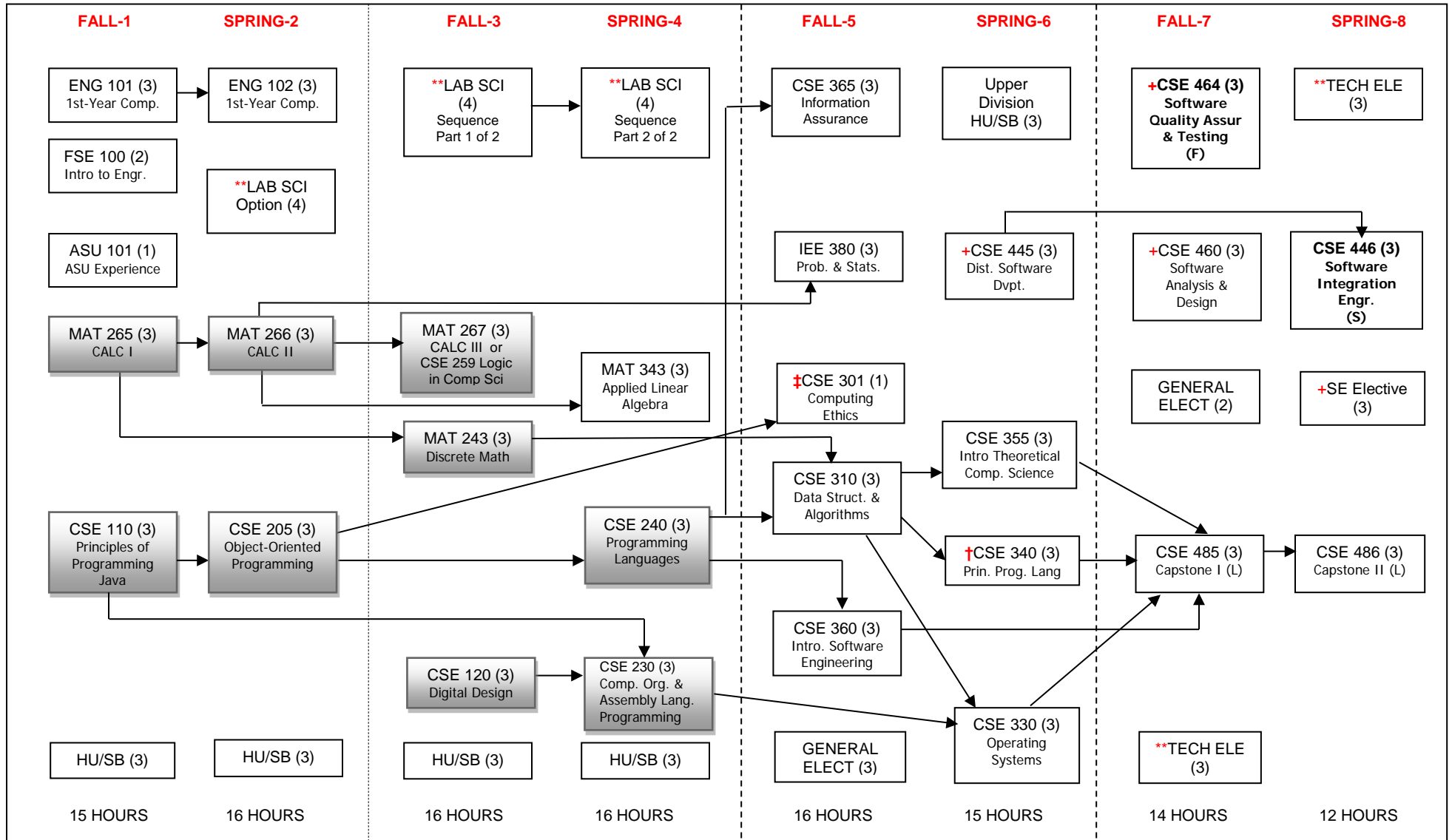


Computer Science (Software Engineering), BS Bachelor of Science, 2019-2020 Catalog Year

ESCSESBS



Notes: ** See CIDSE Advising Center or CIDSE Website (<http://cidse.engineering.asu.edu/degree/requirementsbscs/>) 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 →



Term 1

CSE 110: Principles of Programming with Java -Concepts of problem solving using Java, algorithm design, structured programming, fundamental algorithms and techniques, and computer systems concepts. Social and ethical responsibility.

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 230: Computer Organization & Assembly Language Programming-Register-level computer organization. Instruction set architecture. Assembly language. Processor organization and design. Memory organization. IO programming, Exception/interrupt handling.

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

MAT 343: Applied Linear Algebra-Solving linear systems, matrices, determinants, vector spaces, bases, linear transformations, eigenvectors, norms, inner products, decompositions, applications. Problem solving using MATLAB.

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: 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, 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