School of Computing & Augmented Intelligence
Computer Science, BS (ESCSEBS)
Updated: 2023-24 Catalog Year Requirements

Name: _____

Student ID#: _____

Fall-1	Spring-2	Fall-3	Spring-4	Fall-5	Spring-6	Fall-7	Spring-8
ɬ ENG 101 (3) 1st-Year Comp.	ɬ ENG 102 (3) 1st-Year Comp.	**SQ LAB SCI (4) Sequence Part 1 of 2	**SQ LAB SCI (4) Sequence Part 2 of 2	CSE 301 (1) Computing Ethics	+CSE 412 (3) or +# CSE 434 (3) or + CSE 445 (3)	+ CSE 4XX (3)	+ CSE 4XX (3)
FSE 100 (2) Intro to Engr.		CSE 120 (3) Digital Design	CSE 230 (3) Comp. Org. & Assembly Lang. Programming	CSE 365 (3) Information Assurance	CSE 330 (3) Operating Systems	+ CSE 4XX (3)	+ CSE 4XX (3)
CSE 110 (3) Principles of Programming Java	CSE 205 (3) Object-Oriented Programming	CSE 240 (3) Programming Languages	CSE 310 (3) Data Struct. & Algorithms	CSE 355 (3) Intro Theoretical Comp. Science	# CSE 340 (3) Prin. Programming Language	** + TECH ELECT (3)	** + TECH ELECT (3)
ASU 101 - CAI (1) ASU Experience	**SQ LAB SCI (4) Option	MAT 243 (3) Discrete Math		CSE 360 (3) Intro. Software Engineering		# CSE 485 (3) Capstone I (L)	CSE 486 (3) Capstone II (L)
MAT 265 (3) CALC I	MAT 266 (3) CALC II	MAT 267 (3) CALC III or CSE 259 (3) Logic in Comp Sci	HU or SB (3) & AA	IEE 380 (3) Prob. & Statistics	MAT 343 (3) Applied Linear Algebra	General Elect (2)	
HU or SB (3)	HU or SB (3) & AA		General Elect (3)	HU or SB (3) & AA	Upper-Division HU or SB (3)		
15 HOURS	16 HOURS	16 HOURS	16 HOURS	16 HOURS	15 HOURS	14 HOURS	12 HOURS

NOTES:
ɬ International students may take ENG 107 and ENG 108. Students placing in to ENG 105 will replace ENG 101 with a recommended course

** See SCAI Advising Center or SCAI Website (https://scai.engineering.asu.edu/computer-science-bs/degree-requirements/) for degree requirements and a list of technical electives.

+ All upper-division CSE courses (including CSE 4XX and Tech Elective) require additional prerequisites. Please check the catalog for specific information.

All pre-requisite coursework must be completed prior to taking CSE 485 (CSE 301; CSE 330; CSE 340; CSE 355; CSE 360; ENG 101, 105, or 107)

Shaded courses designate "Critical Requirements" and must be completed as described above to remain on-track. **Off-track twice students will be required to change their major.**

Minimum "C" grade is required in all major courses (see major map for details)

All ASU students must complete required general studies including, 2 lower division HU, 2 lower division SB, one upper division HU or SB and **1 class from each of the 3 Awareness Areas (AA)**

Prerequisite ⟶

☐ *Cultural*   ☐ *Global*   ☐ *Historical*

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: SQ

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

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

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

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 Ill -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 sequence: 1 of 2 from same department, SQ

Term 4

CSE 230: Computer Organization& Assembly Language Programming-Registered computer organization. Instruction set architecture. Assembly language. Processor organization and design. Memory organization. 10 programming, Exception/interrupt handling.

CSE 310: Data Structures and Algorithms-Advanced data structures and algorithms, including stacks, queues, trees (8, 8+, AYL), and graphs. Searching for graphs, hashing, external sorting.

Lab Science sequence: 2 of 2 from same department, SQ

HU/SB: Humanities, Fine Art's & Design or Social& Behavioral Sciences with Awareness Area

General Elective or Awareness Area

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

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 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

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

Term 6

CSE 330: Operating Systems-Operating system structures 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 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)

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.

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 400-Level Elective

CSE 400-Level Elective

Technical Elective: Select from list on major webpage

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 400-Level Elective

CSE 400-Level Elective

Technical Elective: Select from list on major webpage