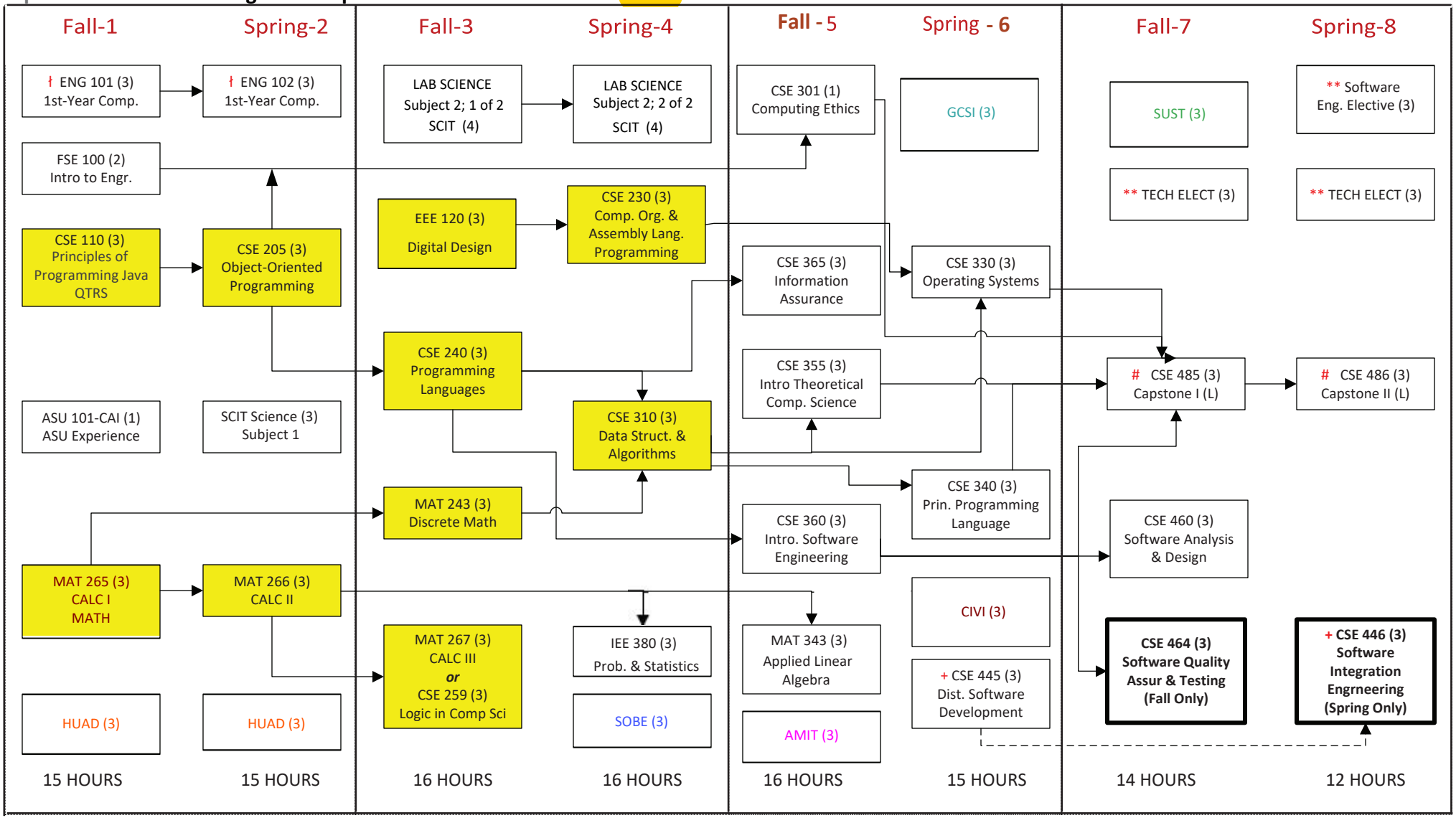
School of Computing & Augmented Intelligence
Computer Science (Software Engineering), BS (ESCSESBS)
Updated: **2024-25 Catalog Year Requirements - General Studies GOLD**

Name: _____
Student ID#: _____



NOTES: ł 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. Global Tech program courses can NOT be used to satisfy major requirements (TE).

\+ All Upper division XXX courses may require additional prerequisites. Please check the catalog for specific course 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 university general studies and First Year Composition. HUAD, SOBE, AMIT, CIVI, GCSI, & SUST classes can be taken in any order.

Term 1

CSE 110: Principles of Programming with Java (QTRS)
-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 26S: Calculus for Engineers I (MATH)
-Limits and continuity, differential calculus of functions of one variable, introduction to integration. Not open to students with credit in MAT 270

ASU 101-CAI: The ASU Experience

ENG 101: First-Year Composition

Humanities, Fine Arts & Design (HUAD)

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

Science: Subject 1 (3 credits)

Humanities, Fine Arts & Design (HUAD)

Term 3

EEE 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 III -Vector-valued functions of several variables, partial derivatives, multiple integration OR

CSE 2S9: 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: Subject 2 - 1 of 2 same department (SCIT)

Term4

CSE 230: Computer Organiz.ation & Assembly Language Programming-Register-level 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 (B, B+, AVL), and graphs. Searching for graphs, hashing, external sorting.

Lab Science: Subject 2 - 2 of 2 same department (SCIT)

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

Social & Behavioral Sciences (SOBE)

Term S

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 35S: 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 mana:ement. team development environments and methodologies: software architectures; quality assurance and standards; legal, ethical issues

CSE 36S: Information Assurance- Concepts of information assurance (IA); basic IA tediniques, policies, risk management administration, legal and ethics issues.

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

American Institutions (AMIT)

Term 6

CSE 330 Operating Systems-Operating system structure and services, processor scheduling, concun-ent 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 44S Distributed Software Development -Distributed system architectures and design, service-oriented computing, and frameworks for development of distributed applications and software components

Governance and Civic Engagement (CIVI)

Global Communities, Societies, and Individuals (GCSI)

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 460: Object-oriented and structured analysis and design; software architecture and design patters; component-based development; software safety and reliability.

CSE 464: Software quality assurance (SQA), software quality metrics, software configuration management software \"enfication and vahdanon. reviews. inspecnons, understanding software testing process, functlonal testin struc-rural testing, model-based tesn ng. model-based tesnn integanon. system. and regression tesnng techniques, software life cycle models and sofhvare testing, testing distributed sofhvare, bug management. and use of testing tools.

Technical Elective: Upper Division Technical Elective from list on DARS/major map (No Global Tech)

Global Sustainability (SUST)

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.

Software Engineering Elective - choose one from CSE 463, CSE 466, CSE 467, or CSE 468

CSE 466: Software Integration Engineering

Technical Elective: Upper Division Technical Elective from list on DARS/major map (No Global Tech)