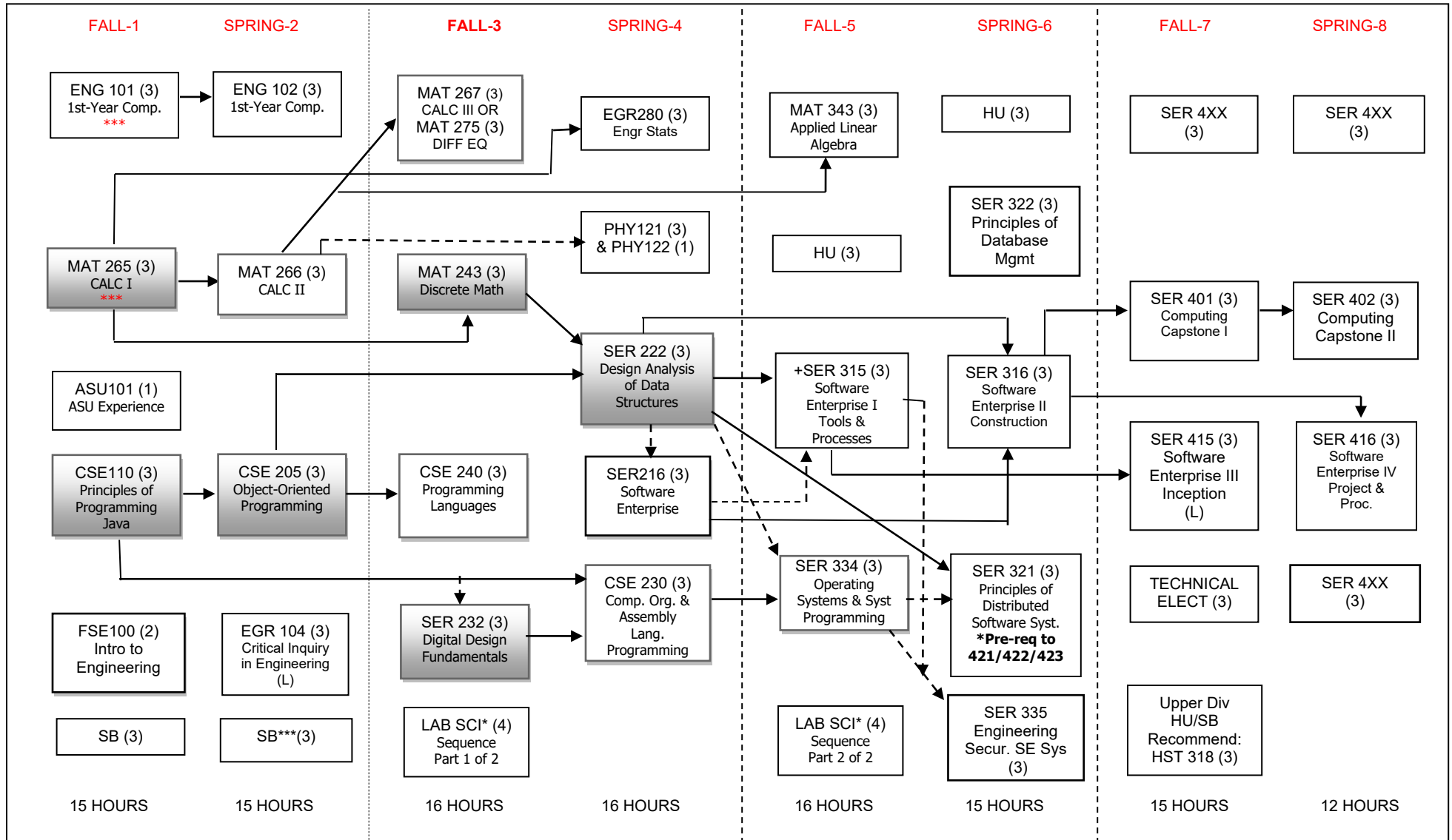


Software Engineering, BS
Bachelor of Science, 2022 Catalog Year
 TSSERBS

NAME:

ID:



Notes: Shaded courses designate critically tracked requirements.

Prerequisite

Co-requisite

*** Requires placement exam score and may require additional courses dependent on placement.

* Lab Science Options: CHM113 & CHM116, BIO181 & BIO182, BIO201 & BIO 202, GLG101/103, GLG102/104, GLG110/111, PHY131/132

Color Coding Key: **Completed Requirements** **Enrolled** **Need to Retake**

+Pre-requisite is FSE100



Term 1:

ENG 101: First-Year Composition

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

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.

Term 2:

ENG 102: First-Year Composition

MAT 266: Calculus for Engineers II -Methods of integration, applications of calculus, elements of analytic geometry, improper integrals, Taylor series

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.

EGR104: Critical Inquiry in Engineering - Critical thinking. Systematic evaluation of information as input to well-informed decision making. Close reading and substantive writing in a technical setting

Term 3:

MAT267: Calculus for Engineers- Vector-valued functions of several variables, partial derivatives, multiple integration. **OR Mat 275: Modern Differential Equations** - Introduces differential equations, theoretical and practical solution techniques. Applications. Problem solving using MATLAB.

MAT243: Discrete Mathematical Structures - Logic, sets, functions, elementary number theory and combinatorics, recursive algorithms, and mathematical reasoning, including induction. Emphasizes connections to computer science.

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

SER232: Systems Fundamentals I - Logic design and computer organization; number systems and arithmetic, boolean algebra; digital systems components; assembly language and instruction set concepts and application.

Lab Science Sequence. Refer to course options outlined on the flow chart.

Term 4:

EGR280: Engineering Statistics - Applications-oriented introduction to statistics with computer-based experience using statistical software for formulating and solving engineering problems.

PHY121/122: University Physics Mechanics 1 Mechanics and laboratory - Kinematics; Newton's laws; work, energy, momentum, conservation laws; dynamics of particles, solids, and fluids. Both PHY 121 and PHY 122 must be taken to secure SQ General Studies credit.

SER222: Data Analysis of Data Structures and Algorithms - Data structures and related algorithms for their specification, complexity analysis, implementation and application. Sorting and searching. Professional responsibilities that are part of program development, documentation and testing.

SER216: Software Enterprise II - Project-centered course covering testing and quality in software engineering; concepts, tools, and methods in testing and quality management; teamwork and communication in software engineering. Project based.

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.

Term 5:

MAT343: Applied Linear Algebra - Solving linear systems, matrices, determinants, vector spaces, bases, linear transformations, eigenvectors, norms, inner products, decompositions, applications. Problem solving using MATLAB.

SER315: Software Enterprise I: Tools and Process - Introduces tools and techniques used in software enterprise/development, including coding, design, testing, configuration management, and personal process management.

SER334: Operating Systems and System Programming - Fundamentals of operating systems, process management, scheduling, synchronization techniques and file management.

Lab Science Sequence. Refer to course options outlined on the flow chart.

Term 6:

SER316: Software Enterprise II - Construction and Transition – Best practices in Software construction in the context of a team project, including refactoring, defensive programming, unit testing, and configuration and release management.

SER321: Software Systems - Design and implementation of distributed software components; process and memory management underlying software applications; sockets, protocols, threads, XML, serialization, reflection, security, and events.

SER322: Principles of Database Management. Fundamental methods in modeling and managing data-oriented systems. Relational, object, and hierarchical data modeling techniques.

SER335: Engineering Secure Software Systems. SE principles applied to securing software systems. Software lifecycle processes, requirements analysis, verification.

Term 7:

SER 401: Computing Capstone Project I – First half of a comprehensive project experience based on cumulative knowledge and skills gained in earlier coursework.

SER415: Software Enterprise III: Inception and Elaboration - Third course in the four-course enterprise sequence. Students perform inception (project launch) and elaboration (requirements analysis) activities in project teams.

SER 4 Elective (3 credits)**

TECHNICAL ELECTIVE: Select from upper division SER, CSE or IFT prefix courses.

Term 8:

SER402: Computing Capstone Project II – Second half of a comprehensive project experience based on cumulative knowledge and skills gained in earlier coursework.

SER416: Software Enterprise IV: Project and Process – Project-centric course focusing on applying software process project management, and technical leadership. Final course in the software enterprise sequence.

Two (2) – SER4 Elective courses (6 credits)**