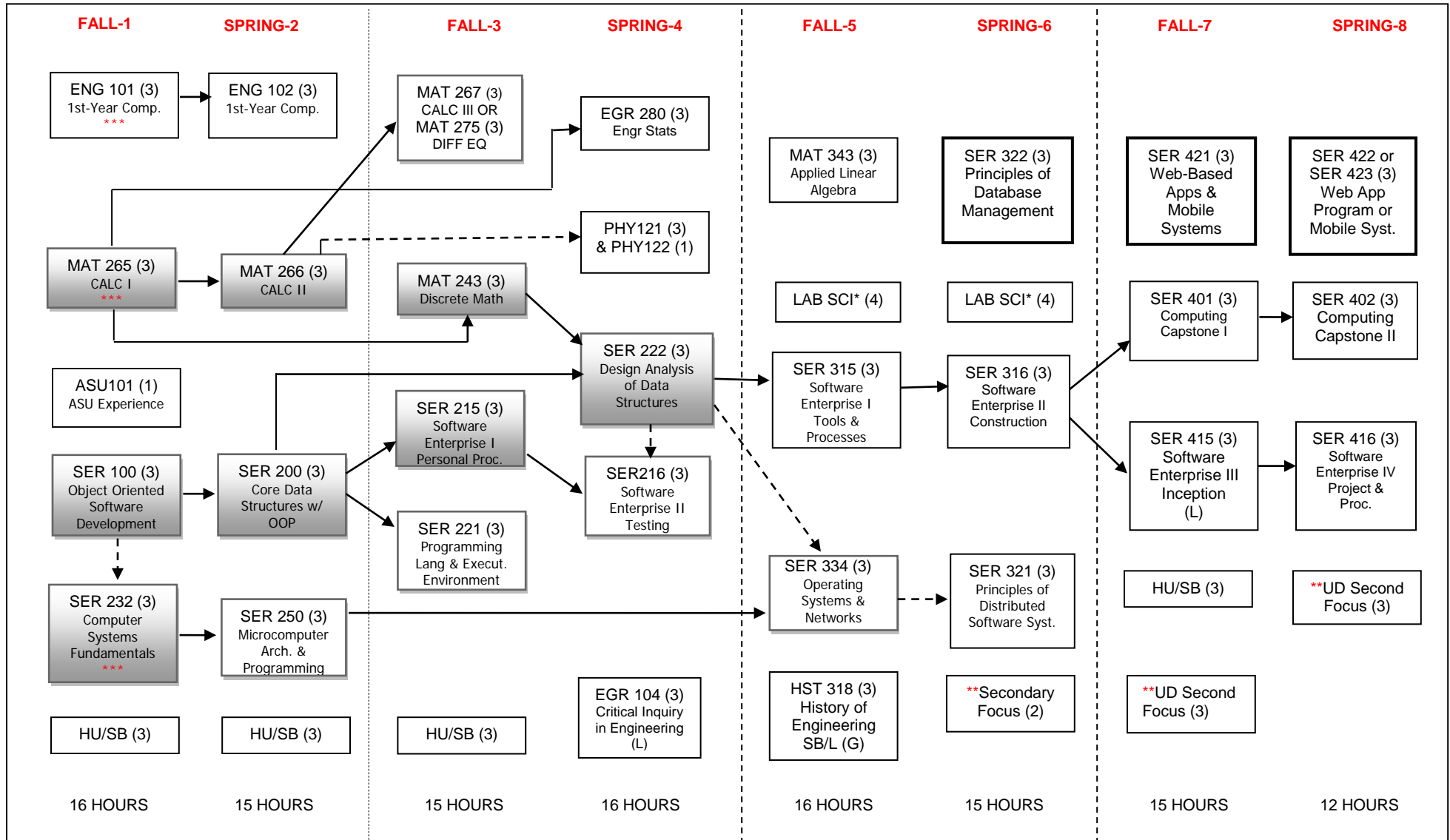


Software Engineering, BS
Bachelor of Science, 2016 Catalog Year
 TSSERBS

Name: _____
 ID: _____

Primary Focus:
Web & Mobile Applications



Notes: ** See CIDSE website or Advisor for Secondary Focus requirements.
 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
 Color Coding Key: Completed Requirements Enrolled Need to Retake

 Cultural
 Global
 Historical

Term 1:

SER100: Object- Oriented Software Development- Introduces problem solving with a state-of-the-art programming language. Expressions, statements, basic control flow and methods. Data, data aggregation and usage. Uses a structured personal software development process to implement solutions representative of common computing applications. Uses development kits for some course activities.

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.

MAT265: Calculus for Engineers I - Limits and continuity, differential calculus of functions of one variable, introduction to integration.

Term 2:

SER 200: Core Data Structures with Object Oriented Programming - Design, implementation and use of core data structures; object-oriented software development: design, analysis and programming.

MAT266: Calculus for Engineers II - Methods of integration, applications of calculus, elements of analytic geometry, improper integrals, Taylor series.

SER250: Microcomputer Architecture and Programming - Microcomputer architecture, instruction set, assembly language programming and debugging, I/O considerations, memory interface, peripherals and busses, exception/interrupt handling.

Term 3:

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

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.

SER215: Software Enterprise 1: Personal Process - Software engineering; personal software processes for individual professionalism; time and defect estimation, yield, and productivity. Software tools. Project based.

SER221: Programming Languages and Their Execution Environment - Introduces the fundamental programming language concepts of data, type, control, abstraction, and structure; software development and execution environments; programming language paradigms.

Term 4:

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.

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.

SER234: Operating Systems and Networks - Fundamentals of operating systems, process management, scheduling, synchronization techniques and file management. Network technology, topologies, protocols, application control; network and operating system security.

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.

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 5:

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 Networks - Fundamentals of operating systems, process management, scheduling, synchronization techniques and file management. Network technology, topologies, protocols, application control; network and operating system security.

MAT343: Applied Linear Algebra - Solving linear systems, matrices, determinants, vector spaces, bases, linear transformations, eigenvectors, norms, inner products, decompositions, applications. Problem solving using MATLAB.4

HST318: History of Engineering - The history of engineering from the earliest record to modern times, examining the social, cultural, and economic effects on society.

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.

Term 7:

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

Term 8:

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.

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