Software Engineering, BS
Bachelor of Science, 2018 Catalog Year

FALL-1
ENG 101 (3) 1st-Year Comp.
ENG 102 (3) 1st-Year Comp.
MAT 265 (3) CALC I
MAT 266 (3) CALC II
CSE110 (3) Principles of Programming Java

SPRING-2
CSE 205 (3) Object-Oriented Programming
CSE 240 (3) Programming Languages
FSE100 (2) Intro to Engineering
EGR 104 (3) Critical Inquiry in Engineering (L)

FALL-3
MAT 267 (3) CALC III OR
MAT 275 (3) DIFF EQ
MAT 243 (3) Discrete Math
MAT 266 (3) CALC II

SPRING-4
PHY121 (3) & PHY122 (1)
EGR280 (3) Engr Stats
SER 222 (3) Design Analysis of Data Structures

FALL-5
MAT 343 (3) Applied Linear Algebra
SER 216 (3) Software Enterprise
SER 232 (3) Principles of Database Management

SPRING-6
SER 315 (3) Software Enterprise I Tools & Processes
SER 316 (3) Software Enterprise II Construction

FALL-7
SER 321 (3) Principles of Distributed Software Syst.
SER 343 (3) Operating Systems & Networks

SPRING-8
SER 322 (3) Principles of Database Management
SER 401 (3) Computing Capstone I
SER 402 (3) Computing Capstone II

LAB SCI* (4) Sequence Part 1 of 2
LAB SCI* (4) Sequence Part 2 of 2
HU/SB (3)
HU/SB*** (3)

Notes:
** See CIDSE website or Advisor for Secondary Focus requirements.
Shaded courses designate critically tracked requirements.
Prerequisite 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, PHY131/132
Color Coding Key: Completed Requirements Enrolled Need to Retake

Primary Focus:
Web & Mobile Applications

Select 6 hours (2 courses) from:
SER421, SER422, SER423

** UD Second Focus (3)
** UD Second Focus (3)
Upper Div HU/SB Recommend: HST 318 (3)

Cultural ***
Global
Historical ***
Term 1:
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.
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.
ASU 101-CSE: The ASU Experience
ENG 101: First-Year Composition

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

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.

PHY121/122: University Physics Mechanics I 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.

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.

Lab Science Sequence: PHY 131/132 or CHM113 & 116 or GLG 101/103 & GLG102/104 or BIO 181 & 182 or BIO201 & 202. Students taking PHY131/132 will need to select 4 more hours of lab science from approved list, i.e. CHM, BIO, GLG.

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, 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.

Lab Science Sequence: PHY 131/132 or CHM113 & 116 or GLG 101/103 & GLG102/104 or BIO 181 & 182 or BIO201 & 202. Students taking PHY131/132 will need to select 4 more hours of lab science from approved list, i.e. CHM, BIO, GLG.

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.