Software Engineering, BS
Bachelor of Science, 2017 Catalog Year
TSSERBS

**Primary Focus:** Web & Mobile Applications

**Name:**
**ID:**

<table>
<thead>
<tr>
<th>FALL-1</th>
<th>SPRING-2</th>
<th>FALL-3</th>
<th>SPRING-4</th>
<th>FALL-5</th>
<th>SPRING-6</th>
<th>FALL-7</th>
<th>SPRING-8</th>
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<tbody>
<tr>
<td>ENG 101 (3) 1st-Year Comp.</td>
<td>ENG 102 (3) 1st-Year Comp.</td>
<td>MAT 267 (3) CALC III OR MAT 275 (3) DIFF EQ</td>
<td>EGR280 (3) Engr Stats</td>
<td>MAT 343 (3) Applied Linear Algebra</td>
<td>SER 322 (3) Principles of Database Management</td>
<td>SER 421 (3) Web-Based Apps &amp; Mobile Systems</td>
<td>SER 422 or SER 423 (3) Web App Program or Mobile Syst.</td>
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<td>MAT 265 (3) CALC I ***</td>
<td>MAT 266 (3) CALC II</td>
<td>PHA121 (3) &amp; PHY122 (1)</td>
<td>CHEM116 (4) Sequence Part 1 of 2</td>
<td>LAB SCI* (4) Sequence Part 2 of 2</td>
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<td>ASU101 (1) ASU Experience</td>
<td>CSE 205 (3) Object-Oriented Programming</td>
<td>CSE 240 (3) Programming Languages</td>
<td>SER 222 (3) Design Analysis of Data Structures</td>
<td>SER 315 (3) Software Enterprise I Tools &amp; Processes</td>
<td>SER 316 (3) Software Enterprise II Construction</td>
<td>SER 401 (3) Computing Capstone I</td>
<td>SER 402 (3) Computing Capstone II</td>
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<td>FSE100 (2) Intro to Engineering</td>
<td>EGR 104 (3) Critical Inquiry in Engineering (L)</td>
<td>SER 232 (3) Digital Design Fundamentals</td>
<td>CSE 230 (3) Comp. Org. &amp; Assembly Lang. Programming</td>
<td>HST 318 (3) History of Engineering SB/L (G)</td>
<td>**Secondary Focus (3)</td>
<td>HU/SB** (3)</td>
<td>**UD Second Focus (3)</td>
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<td>HU/SB (3)</td>
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**15 HOURS**

**15 HOURS**

**15 HOURS**

**16 HOURS**

**16 HOURS**

**16 HOURS**

**15 HOURS**

**12 HOURS**

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

**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

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 - 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:
SER 216: 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.
SER 222: 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.

PHY 121/122: 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.

Term 5:
SER 315: 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.
SER 334: 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.
HST 318: History of Engineering - The history of engineering from the earliest record to modern times, examining the social, cultural, and economic effects on society.
Lab Science Sequence: PHY 131/132 or CHM 113 & 116 or GLG 101/103 & GLG 102/104 or BIO 181 & 182 or BIO 201 & 202. Students taking PHY 131/132 will need to select 4 more hours of lab science from approved list, i.e. CHM, BIO, GLG.

Term 6:
SER 316: 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.
SER 321: 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 CHM 113 & 116 or GLG 101/103 & GLG 102/104 or BIO 181 & 182 or BIO 201 & 202. Students taking PHY 131/132 will need to select 4 more hours of lab science from approved list, i.e. CHM, BIO, GLG.

Term 7:
SER 415: 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:
SER 416: 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.
SER 402: Computing Capstone Project II - Second half of a comprehensive project experience based on cumulative knowledge and skills gained in earlier coursework.