### Software Engineering, BS
Bachelor of Science, 2018 Catalog Year

#### TSSERBS

<table>
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<tr>
<th>FALL-1</th>
<th>SPRING-2</th>
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<th>FALL-5</th>
<th>SPRING-6</th>
<th>FALL-7</th>
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<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) Applied Linear Algebra</td>
<td>MAT 343 (3) Engr Stats</td>
<td>**Secondary Focus (3)</td>
<td>**UD Second Focus (3)</td>
<td>**UD Second Focus (3)</td>
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<td>MAT 265 (3) CALC I ***</td>
<td>MAT 266 (3) CALC II</td>
<td>MAT 243 (3) &amp; PHY122 (1)</td>
<td>PHY121 (3) 1st-Year Comp.</td>
<td>HU/SB (3)</td>
<td>HU/SB*** (3)</td>
<td>Upper Div HU/SB Recommend: HST 318 (3)</td>
<td>SER 401 (3) Computing Capstone I</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) Operating Systems &amp; Networks</td>
<td>LAB SCI* (4) Sequence Part 1 of 2</td>
<td>LAB SCI* (4) Sequence Part 2 of 2</td>
<td>Primary Focus TBD</td>
<td>Primary Focus TBD</td>
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<tr>
<td>HU/SB (3)</td>
<td>HU/SB*** (3)</td>
<td>LAB SCI* (4) Sequence Part 1 of 2</td>
<td>LAB SCI* (4) Sequence Part 2 of 2</td>
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**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, BIO201 & BIO 202, GLG101/103 & GLG102/104, PHY131/132

*Pre-requisite is FSE100

**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
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 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:
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, 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.
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.