### Software Engineering, BS
**Bachelor of Science, 2016 Catalog Year**

#### Notes:
** See CIDSE website or Advisor for Secondary Focus requirements.
- Shaded courses designate critically tracked requirements.
- ** 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

#### Color Coding Key:
- Completed Requirements
- Enrolled
- Need to Retake

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<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>EGR 280 (3) Engr Stats</td>
<td>MAT 343 (3) Applied Linear Algebra</td>
<td>SER 450 (3) Computer Architecture</td>
<td>SER 456 (3) Embedded Interfaces</td>
<td>SER 486 (3) Embedded C Prgrmg</td>
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<td>MAT 265 (3) CALC I ***</td>
<td>MAT 266 (3) CALC II</td>
<td>MAT 243 (3) Discrete Math</td>
<td>PHY121 (3) &amp; PHY122 (1)</td>
<td>LAB SCI* (4)</td>
<td>LAB SCI* (4)</td>
<td>SER 401 (3) Computing Capstone I</td>
<td>SER 402 (3) Computing Capstone II</td>
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<td>ASU101 (1) AGU Experience</td>
<td>SER 215 (3) Software Enterprise I Personal Proc.</td>
<td>SER 221 (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 415 (3) Software Enterprise III Inception (L)</td>
<td>SER 416 (3) Software Enterprise IV Project &amp; Proc.</td>
<td>HU/SB (3) **UD Second Focus (3)</td>
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<td>SER 100 (3) Object Oriented Software Development</td>
<td>SER 200 (3) Core Data Structures w/ OOP</td>
<td>SER 221 (3) Programming Lang &amp; Execut. Environment</td>
<td>SER 334 (3) Operating Systems &amp; Networks</td>
<td>SER 321 (3) Principles of Distributed Software Syst.</td>
<td>**Secondary Focus (2)</td>
<td>**Secondary Focus (3)</td>
<td>**UD Second Focus (3)</td>
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<td>SER 232 (3) Computer Systems Fundamentals ***</td>
<td>SER 250 (3) Microcomputer Arch. &amp; Programming</td>
<td>SER 221 (3) Software Enterprise II Testing</td>
<td>SER 344 (3) Operating Systems &amp; Networks</td>
<td>** Secondary Focus (2)</td>
<td>** Secondary Focus (3)</td>
<td>**UD Second Focus (3)</td>
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<td>HU/SB (3)</td>
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<td>EGR 104 (3) Critical Inquiry in Engineering (L)</td>
<td>HST 318 (3) History of Engineering SB/L (G)</td>
<td>** Secondary Focus (2)</td>
<td>** Secondary Focus (3)</td>
<td>**UD Second Focus (3)</td>
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| 16 HOURS | 15 HOURS | 15 HOURS | 16 HOURS | 16 HOURS | 15 HOURS | 15 HOURS | 12 HOURS |

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| Name: | ID: | Primary Focus: Embedded Systems | 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.
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.

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.
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.