Software Engineering, BS
Bachelor of Science, 2014-2015 Catalog Year
TSSERBS

FALL-1
ENG 101 (3)
1st-Year Comp. ***
CTI 101 (1)
Success in Tech ****
MAT 265 (3)
CALC I ***
CST 100 (3)
Object Oriented Software Development
CST 200 (3)
Core Data Structures w/ OOP
SER 232 (3)
Computer Systems Fundamentals ***
HU/SB (3)
13 HOURS

SPRING-2
ENG 102 (3)
1st-Year Comp.
SG/SQ (4)
MAT 266 (3)
CALC II
MAT 243 (3)
Discrete Math
SER 234 (3)
Operating Systems & Networks
CST 200 (3)
Core Data Structures w/ OOP
SER 215 (3)
Software Enterprise I
Personal Proc.
SER 221 (3)
Programming Lang & Executive Environment
HU/SB (3)
16 HOURS

FALL-3
EGR280 (3)
Engineering Statistics
MAT 267 (3)
CALC III OR MAT 275 (3) DIFF EQ
SER 222 (3)
Design Analysis of Data Structures %
SER 221 (3)
Software Enterprise II Testing
CST 250 (3)
Microcomputer Arch. & Programming
HU/SB (3)
15 HOURS

SPRING-4
PHY121 (3) & PHY122 (1) %
**Secondary Focus (3)
**
MAT 343 (3)
Applied Linear Algebra
SER 224 (3)
Operating Systems & Networks
SER 221 (3)
Software Enterprise II Personal Proc.
SER 222 (3)
Design Analysis of Data Structures %
CST 250 (3)
Microcomputer Arch. & Programming
HU/SB (3)
15 HOURS

FALL-5
EGR 104 (3)
Critical Inquiry in Engineering (L) %
MAT Elective Or SG (3-4)
MAT 267 (3)
CALC III OR MAT 275 (3) DIFF EQ
**Secondary Focus (3)
**
MAT 343 (3)
Applied Linear Algebra
SER 224 (3)
Operating Systems & Networks
SER 221 (3)
Software Enterprise II Personal Proc.
CST 250 (3)
Microcomputer Arch. & Programming
HU/SB (3)
16 HOURS

SPRING-6
**UD Second Focus (3)
**UD Second Focus (3)
PHYS121 (3) & PHYS122 (1) %
**Secondary Focus (3)
**
MAT 343 (3)
Applied Linear Algebra
SER 224 (3)
Operating Systems & Networks
SER 221 (3)
Software Enterprise II Personal Proc.
CST 250 (3)
Microcomputer Arch. & Programming
HU/SB (3)
15 HOURS

FALL-7
SER 401 (3)
Computing Capstone I %
SER 402 (3)
Computing Capstone II
SER 232 (3)
Software Enterprise II Testing
SER 221 (3)
Software Enterprise II Personal Proc.
SER 224 (3)
Operating Systems & Networks
SER 221 (3)
Software Enterprise II Personal Proc.
CST 250 (3)
Microcomputer Arch. & Programming
HU/SB (3)
15-16 HOURS

SPRING-8
SER 421 (3)
Web Application Programming
CST 416 (3)
Software Enterprise IV Project & Proc. %
CST 415 (3)
Software Enterprise III Inception (L) %
CST 316 (3)
Software Enterprise II Construction
SER 322 (3)
Principles of Database Management %
SER 421 (3)
Web Application Programming
CST 415 (3)
Software Enterprise III Inception (L) %
CST 316 (3)
Software Enterprise II Construction
SER 322 (3)
Principles of Database Management %
CST 250 (3)
Microcomputer Arch. & Programming
HU/SB (3)
15 HOURS

Notes:
** See CIDSE website or Advisor for Secondary Focus requirements.
Shaded courses designates critically tracked requirements.
Prerequisite Co-requisite
% indicates prerequisites not listed by arrows. See major map for more information.
*** Requires placement exam score and may require additional courses dependent on placement.
**** Not required for transfer students
Color Coding Key: Completed Requirements Enrolled Need to Retake

Primary Focus:
Web and Mobile Applications
Term 1:
CST100: 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.

CTI1101: Success in Technology and Innovation
MAT265: Calculus for Engineers I - Limits and continuity, differential calculus of functions of one variable, introduction to integration.
ENG101: First Year Composition
HU and C: Humanities and Cultural Awareness

Term 2:
CST 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.
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.
ENG102: First Year Composition

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.
SER215: Software Enterprise - 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.
SB: Social and Behavioral Science

Term 4:
CST250: Microcomputer Architecture and Programming - Microcomputer architecture, instruction set, assembly language programming and debugging, I/O considerations, memory interface, peripherals and busses, exception/interrupt handling.
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.
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:
CST315: 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.
HST318: History of Engineering - The history of engineering from the earliest record to modern times, examining the social, cultural, and economic effects on society.
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. Prerequisites:

Secondary Focus:
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 6:
CST316: 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.
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

Upper Division Primary Focus:
HU and H: Humanities, Arts, and Design and Historical Awareness

Term 7:
CST415: 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.
UD PF: Upper Division Primary Focus
UD SF: Upper Division Secondary Focus
SG or Math elective

Term 8:
CST416: 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.
UD PF: Upper Division Primary Focus
UD SF: Upper Division Secondary Focus
UD SB or UD HU: Upper Division Social Behavioral Sciences or Humanities