Software Engineering

(Bachelor of Science)

Software Engineering Student Outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Major

Code	Title	Credits
Supporting Courses (Non-CS classes)		**22**
ENGR 236	Technical Writing and Information Literacy	
MATH 202	Calculus and Analytic Geometry I	
MATH 203	Calculus and Analytic Geometry II	
MATH 260	Introductory Statistics	
MATH 320	Linear Algebra and Matrix Theory	
Choose 1 from the following COMM Courses):		
COMM 133	Fundamentals of Public Address	
COMM 166	Fundamentals of Interpersonal Communication	
COMM 237	Small Group Communication	
Fundamental Courses		**24**
COMP SCI 120	Web Programming	
COMP SCI 130	Computer Programming I	
COMP SCI 140	Programming for Quantitative Problem Solving	
COMP SCI 171	Technology, Ethics, and Society	
COMP SCI 181	Human-Centered Design	
COMP SCI 221	Database Design & Management	
COMP SCI 240	Discrete Mathematics	
COMP SCI 251	Computer Systems Fundamentals	
Advanced Courses		**18**
COMP SCI 330	Computer Programming II	
COMP SCI 348	Computer Networks	
COMP SCI 351	Data Structures	
COMP SCI 353	Computer Architecture and Organization	
COMP SCI 450	Theory of Algorithms	
COMP SCI 452	Operating Systems Using Linux	
Software Engineering Major Courses		**18**
SE 310	Software Engineering Fundamentals	
SE 320	Software Tools and Process	
SE 340	Software Requirements & Architecture	
SE 350	Software Quality	
SE 490	Software Engineering Capstone	
SE 490	Software Engineering Capstone	
Upper-level Elective (choose two):		**6**

COMP SCI 361	Information Assurance and Security
COMP SCI 362	Artificial Intelligence & Data Science
COMP SCI 357	Theory of Programming Languages
COMP SCI 373	Cloud Computing
COMP SCI 392	Introduction to Mobile Computing
COMP SCI 421	Parallel & Distributed Computing
COMP SCI 451	Database Systems and Big Data Processing
COMP SCI 465	Machine Learning
COMP SCI 466	Deep Learning
COMP SCI 470	Natural Language Processing
COMP SCI 471	Software Security
COMP SCI 472	Network Security
COMP SCI 473	Digital Forensics
COMP SCI 475	Introduction to Cryptography
COMP SCI 476	Ethical Hacking
COMP SCI 497	Internship
Total Credits	**88**

Curriculum Guide

Course	Title	Credits
First Year		
Fall		
COMP SCI 120	Web Programming	3
ENGR 236	Technical Writing and Information Literacy	3
COMM 133 or COMM 166 or COMM 237	Fundamentals of Public Address or Fundamentals of Interpersonal Communication or Small Group Communication	3
GenEd Course 1		3
MATH 202	Calculus and Analytic Geometry I	4
	Credits	**16**
Spring		
COMP SCI 130	Computer Programming I	3
COMP SCI 171	Technology, Ethics, and Society	3
COMP SCI 251	Computer Systems Fundamentals	3
GenEd Course 2		3
MATH 260	Introductory Statistics	4
	Credits	**16**
Second Year		
Fall		
COMP SCI 140	Programming for Quantitative Problem Solving	3
COMP SCI 240	Discrete Mathematics	3
COMP SCI 330	Computer Programming II	3
GenEd Course 3		3
MATH 203	Calculus and Analytic Geometry II	4
	Credits	**16**
Spring		
COMP SCI 181	Human-Centered Design	3
COMP SCI 221	Database Design & Management	3
SE 310	Software Engineering Fundamentals	3
GenEd Course 4		3
MATH 320	Linear Algebra and Matrix Theory	4
	Credits	**16**
Third Year		
Fall		
COMP SCI 348	Computer Networks	3
COMP SCI 353	Computer Architecture and Organization	3
COMP SCI 361	Information Assurance and Security	3
SE 320	Software Tools and Process	3

GenEd Course 5		3
	Credits	**15**
Spring		
COMP SCI 373	Cloud Computing	3
COMP SCI 450	Theory of Algorithms	3
COMP SCI 452	Operating Systems Using Linux	3
SE 340	Software Requirements & Architecture	3
SE 350	Software Quality	3
	Credits	**15**
Fourth Year		
Fall		
SE 490	Software Engineering Capstone	3
Upper-level Elective 1		3
GenEd Course 7		3
GenEd Course 8		3
Free Elective		3
	Credits	**15**
Spring		
SE 490	Software Engineering Capstone	3
Upper-level Elective 2		3
GenEd Course 9		3
GenEd Course 10		3
	Credits	**12**
	Total Credits	**121**

Faculty

Tanim Ahsan; Associate Professor; Ph.D., Marquette University*

Iftekhar Anam; Associate Professor; Ph.D., University of Memphis, chair*

Nazim Choudhury; Associate Professor; Ph.D., University of Sydney*

Sayeda Farzana Aktar; Assistant Professor; Ph.D., Marquette University

Prakash Duraisamy; Assistant Professor; Ph.D., University of North Texas

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Md Golam Murshed; Assistant Professor; Ph.D., Clarkson University