Bachelor of Science in Software Engineering

Program Overview

The software engineering major focuses on the software development process and the implementation of software systems. The foundation of software development consists of soliciting and documenting customer requirements, creative problem-solving, and effective software design. This is followed by constructing, testing, documenting, and delivering professional quality software systems that are reliable, maintainable, and extensible. Emphasis is placed on working with industries and software companies to provide students with real-world software experience through classroom projects, internships, and senior research. Graduates will be prepared for successful careers in software development in a wide variety of businesses and industries and will be equipped to pursue a variety of graduate programs in computing.

Degree Requirements

To earn this degree, students must have a GPA of 2.0 or higher in the Major as well as an overall GPA of 2.0, complete a minimum of 120 credit hours, and fulfill the course requirements of the program listed below.

*This is a sample plan; specific courses may vary from year to year. Academic advisors will work with each student to develop their individual schedule.

	Major-Specific Required Courses		CREDITS
✓			
	CPTR 111	Foundations of Computer Science I	4
	CPTR 113	Foundations of Computer Science II	3
	CPTR 231	Object-Oriented Programming	3
	CPTR 310	Algorithms and Data Structures	3
	CPTR 340	Software Engineering Methodologies	3
	CPTR 342	Software Quality	3
	CPTR 420	Software Requirements Engineering	3
	CPTR 422	Software Architecture and Design	3
	DATA 231	Database Programming and Design	4
	IDIV 205	Technical Writing	3
	MATH 251^	Linear Algebra I	4
	MATH 130	Discrete Mathematics	4
	Choose 1 of the following:		CREDITS
	CPTR 475	Internship in Software Engineering	3
	CPTR 499	Senior Project	3
	6 or more hours of approved electives selected from:		CREDITS
	CPTR 410	Topics in Computer Science	4
	CPTR 2XX	Video Game Design I	4
	CPTR 3XX	Video Game Design II	4
	MATH 340	Linear Algebra II	3

Total Program Credits: 120+

MAJOR	*Options
CORE	^CORE equivalent
ELECTIVE/MINOR	
EXPERIENTIAL	

	CORE		CREDITS
✓		Foundation	
	LA-FWS	First-Year Writing Seminar	3
	LA-FCS	First-Year Communication Seminar	3
	LA-FQR	Quantitative Reasoning	3-4
	LA-FSS	First Year Success Seminar	1
	LA-FCG	Cultural and Global Understanding	3-5
		Exploration	
	LA-EAH	Arts and Humanities	3
	LA-ENS	Natural Sciences	3-6
	LA-ESS	Social Sciences	3-4
		Transformation	
	LA-TFR	Faith, Reason, and Ethics	3
	LA-TBI	Big Issues - 2 courses	6-7
	LA-TCE	Creative Expression	1-3
	Additional credits to bring total to 120+ credits		CREDITS
✓		Electives	
		Experiential Learning	

Example Course Sequence:

The following is a sample of a semester-by-semester approach to completing this program in 4 years.

YEAR 1			
FIRST SEMESTER			
COURSE		CREDITS	PREREQUISITES
CPTR 111	Foundations of Computer Science I	4	Fall
LA-FWS	First-Year Writing Seminar	3	
LA-FSS	First Year Success Seminar	1	
LA-FCS	First-Year Communication Seminar	3	
ELECTIVE/MINOR		3	
JAN TERM			
COURSE		CREDITS	
ELECTIVE/MINOR		3	
SECOND SEMESTER			
COURSE		CREDITS	
CPTR 113	Foundations of Computer Science II	3	CPTR 111, Spring
LA-TFR	Faith, Reason, and Ethics	3	
LA-ESS	Social Sciences	3	
ELECTIVE/MINOR		3	
		29	

YEAR 2			
THIRD SEMESTER			
COURSE		CREDITS	PREREQUISITES
CPTR 231	Object-Oriented Programming	3	CPTR 113
LA-EAH	Arts and Humanities	3	
ELECTIVE/MINOR		3	
ELECTIVE/MINOR		3	
JAN TERM			
COURSE		CREDITS	
ELECTIVE/MINOR		3	
FOURTH SEMESTER			
COURSE		CREDITS	
IDIV 205	Technical Writing	3	Fall, even years
MATH 130	Discrete Mathematics	4	MATH 120, Spring
LA-ENS	Natural Sciences	3	
LA-TCE	Creative Expression	3	
		28	

4-Year Sample Schedule Cont.

YEAR 3			
FIFTH SEMESTER			
COURSE		CREDITS	PREREQUISITES
MATH 251	Linear Algebra I	4	
CPTR 310	Algorithms and Data Structures	3	CPTR 113, MATH 130, Fall, odd years
CPTR 342	Software Quality	3	CPTR 113, Fall, odd years
LA-TBI	Big Issues	3	
JAN TERM			
COURSE		CREDITS	
CPTR 410	Topics in Computer Science	4	
EXPERIENTIAL		3	
SIXTH SEMESTER			
COURSE		CREDITS	
CPTR 340	Software Engineering Methodologies	3	CPTR 113, Spring, even years
MATH 340	Linear Algebra II	3	
LA-TBI	Big Issues	3	
LA-FCG	Cultural and Global Understanding	3	
EXPERIENTIAL		3	
		35	

YEAR 4			
SEVENTH SEMESTER			
COURSE		CREDITS	PREREQUISITES
CPTR 420	Software Requirements Engineering	3	CPTR 340, IDIV 205, Fall, even years
DATA 231	Database Programming and Design	4	CPTR 113 or DATA 110, MATH 130, Fall, even years
CPTR 499	Senior Project	2	Permission of dept chair
ELECTIVE/MINOR		3	
EXPERIENTIAL		3	
JAN TERM			
COURSE		CREDITS	
EXPERIENTIAL		3	
EIGHTH SEMESTER			
COURSE		CREDITS	
CPTR 499	Senior Project	2	Permission of dept chair
CPTR 422	Software Architecture and Design	3	CPTR 340, Spring, odd years
ELECTIVE/MINOR		3	
EXPERIENTIAL		3	
		29	
	TOTAL CREDITS	121	