Software Engineering, B.S.

Software Engineers design and develop large software systems. In addition, they may lead teams of software developers or quality assurance engineers. They also work with users and customers to understand their needs. Software systems we take for granted, such as Microsoft Office, are implemented by software engineers. Software engineers employ innovative software development approaches, such as Agile software development, to effectively manage software development projects.

Matriculation Requirements

1. Completion of CS 1400 Fundamentals of Programming, CS 1410 Object Oriented Programming, CS 2300 Discrete Mathematical Structures I, CS 2420 Introduction to Algorithms and Data Structures, and CS 2450 Software Engineering with a grade of C+ better.
2. Completion of MATH 1210 Calculus I QL and (ENGL 1010 Introduction to Academic Writing CC or ENGH 1005 Literacies and Composition Across Contexts CC) with a grade of C or better.
3. Each of CS 1400, CS 1410, CS 2300, CS 2420, MATH 1210, and (ENGL 1010 or ENGH 1005) cannot be taken more than twice to obtain the required grade.
4. Overall GPA of 2.5 or higher.

Program Requirements

Code	Title	Credit Hours
Total Credit Hours		**120**
General Education Requirements		**38 Credits**
ENGL 1010	Introduction to Academic Writing CC	3
or ENGH 1005	Literacies and Composition Across Contexts CC	
ENGL 2010	Intermediate Academic Writing CC	3
MATH 1210	Calculus I QL [1]	4
American Institutions - Complete one of the following:		3
HIST 1740	US Economic History AS (3)	
HIST 1700	American Civilization AS (3)	
POLS 1000	American Heritage AS (3)	
POLS 1100	American National Government AS (3)	
HIST 2700 & HIST 2710	US History to 1877 AS and US History since 1877 AS (6)	
Complete the following:		
PHIL 2050	Ethics and Values IH	3
HLTH 1100	Personal Health and Wellness TE	2
or EXSC 1097	Fitness for Life TE	
Distribution Requirements:		
Biology		3
Physical Science (Choose from list)		3
Complete one of the following additional GE course/lab combinations:		5
BIOL 1610 & BIOL 1615	College Biology I BB and College Biology I Laboratory (5)	
CHEM 1210 & CHEM 1215	Principles of Chemistry I PP and Principles of Chemistry I Laboratory (5)	
PHYS 2020 & PHYS 2025	College Physics II PP and College Physics II Lab (5)	
PHYS 2210 & PHYS 2215	Physics for Scientists and Engineers I PP and Physics for Scientists and Engineers I Lab (5)	
PHYS 2220 & PHYS 2225	Physics for Scientists and Engineers II PP and Physics for Scientists and Engineers II Lab (5)	
GEO 1010 & GEO 1015 & GEO 202R	Introduction to Geology PP and Introduction to Geology Laboratory and Science Excursion (5)	

Fine Arts		3
COMM 1020	Public Speaking HH [1]	3
COMM 2110	Interpersonal Communication SS [1]	3
Discipline Core Requirements		**70 Credits**
Complete one of the following:		6
CS 1400 & CS 1410	Fundamentals of Programming and Object Oriented Programming (6)	
CS 1420	Accelerated Introduction to Programming (undefined) (and an additional 3 credit CS elective not already completed) [2]	
STAT 2050	Introduction to Statistical Methods	4
CS 2300	Discrete Mathematical Structures I	3
CS 2370	C Plus Plus Programming	3
CS 2810	Computer Organization and Architecture	3
CS 2420	Introduction to Algorithms and Data Structures	3
CS 2450	Software Engineering WE	3
CS 2600	Computer Networks I	3
CS 2700	Causal Inference	3
CS 305G	Global Social and Ethical Issues in Computing GI WE	3
CS 3060	Operating Systems Theory	3
CS 3100	Data Privacy and Security	3
CS 3240	Discrete Mathematical Structures II	3
CS 3310	Analysis of Algorithms	3
Complete one of the following:		3
CS 3250	Java Software Development (3)	
CS 3370	C Plus Plus Software Development (3)	
CS 3260	CsharpNET Software Development (3)	
CS 3270	Python Software Development (3)	
CS 3380	JavaScript Software Development (undefined)	
CS 339R	Advanced Programming Language Other (3)	
CS 3450	Principles and Patterns of Software Design	3
CS 3410	Human Factors in Software Development	3
CS 3520	Database Theory	3
CS 4230	Software Testing and Quality Engineering	3
CS 4400	Software Engineering II	3
CS 4450	Analysis of Programming Languages	3
CS 4550	Software Engineering III	3
Elective Requirements		**12 Credits**
Complete 12 credits from the following:		12
Any CS course numbered 3000 or higher not already required.		

1

Minimum grade of C- required.

2

If students choose CS 1420, please see advisor.

Graduation Requirements

1. Completion of a minimum of 120 semester credits, with a minimum of 40 upper-division credits.
2. Overall grade point average of 2.0 or above. Must have a minimum grade of C- with a combined GPA of 2.5 or higher in all discipline core and elective requirements and the General Education requirements marked with a footnote 1.
3. Residency hours -- minimum of 30 credit hours through course attendance at UVU. Ten of these hours must be within the last 45 hours earned. At least 12 of the credit hours earned in residence must be in approved CSE Department courses.

4. No more than 80 semester hours and no more than 20 hours of transfer credit from a two-year college may be applied to the core or elective courses.
5. No more than 6 semester hours may be earned through independent study.
6. Successful completion of at least one Global/Intercultural course.
7. Successful completion of at least two Writing Enriched (WE) courses.

Graduation Plan

This graduation plan is a sample plan and is intended to be a guide. Your specific plan may differ based on your Math and English placement and/or transfer credits applied. You are encouraged to meet with an advisor and set up an individualized graduation plan in Wolverine Track (http://www.uvu.edu/wolverinetrack/).

First Year		
Semester 1		**Credit Hours**
CS 1400	Fundamentals of Programming	3
MATH 1210	Calculus I QL	4
ENGL 1010 or ENGH 1005	Introduction to Academic Writing CC or Literacies and Composition Across Contexts CC	3
GE		3
	Credit Hours	**13**
Semester 2		
CS 1410	Object Oriented Programming	3
CS 2810	Computer Organization and Architecture	3
STAT 2050	Introduction to Statistical Methods	4
ENGL 2010	Intermediate Academic Writing CC	3
GE		3
	Credit Hours	**16**
Second Year		
Semester 3		
CS 2420	Introduction to Algorithms and Data Structures	3
CS 2300	Discrete Mathematical Structures I	3
CS 2370	C Plus Plus Programming	3
HLTH 1100 or EXSC 1097	Personal Health and Wellness TE or Fitness for Life TE	2
Complete one of the following		5
BIOL 1610 & BIOL 1615	College Biology I BB and College Biology I Laboratory	
CHEM 1210 & CHEM 1215	Principles of Chemistry I PP and Principles of Chemistry I Laboratory	
PHYS 2020 & PHYS 2025	College Physics II PP and College Physics II Lab	
PHYS 2210 & PHYS 2215	Physics for Scientists and Engineers I PP and Physics for Scientists and Engineers I Lab	
PHYS 2220 & PHYS 2225	Physics for Scientists and Engineers II PP and Physics for Scientists and Engineers II Lab	
GEO 1010 & GEO 1015 & GEO 202R	Introduction to Geology PP and Introduction to Geology Laboratory and Science Excursion	
	Credit Hours	**16**
Semester 4		
CS 2450	Software Engineering WE	3
CS 2600	Computer Networks I	3
Complete one of the following:		3
CS 3250	Java Software Development	
CS 3260	CsharpNET Software Development	
CS 3270	Python Software Development	
CS 3370	C Plus Plus Software Development	
CS 3380	JavaScript Software Development	
CS 339R	Advanced Programming Language Other	
COMM 1020	Public Speaking HH	3
Physical Science		3
	Credit Hours	**15**

Third Year		
Semester 5		
CS 3410	Human Factors in Software Development	3
CS 3100	Data Privacy and Security	3
CS Elective		6
PHIL 2050	Ethics and Values IH	3
	Credit Hours	**15**
Semester 6		
CS 3060	Operating Systems Theory	3
CS 3240	Discrete Mathematical Structures II	3
CS 3450	Principles and Patterns of Software Design	3
CS 3520	Database Theory	3
CS Elective		3
	Credit Hours	**15**
Fourth Year		
Semester 7		
CS 4450	Analysis of Programming Languages	3
CS 4400	Software Engineering II	3
CS 4230	Software Testing and Quality Engineering	3
GE		3
CS Elective		3
	Credit Hours	**15**
Semester 8		
CS 2700	Causal Inference	3
CS 305G	Global Social and Ethical Issues in Computing GI WE	3
CS 3310	Analysis of Algorithms	3
CS 4550	Software Engineering III	3
COMM 2110	Interpersonal Communication SS	3
	Credit Hours	**15**
	Total Credit Hours	**120**

Program Learning Outcomes

1. Graduates are proficient in using data structures and algorithms. They understand how to implement them, when to apply them, and the abstractions associated with their use.
2. Graduates understand the foundations of computer architecture.
3. Graduates are able to develop solutions to significant software development problems.
4. Graduates will be able to provide internal and external software documentation.
5. Graduates are able to function effectively on teams to accomplish a common goal.
6. Graduates understand software project lifecycles and development processes, and can follow standard processes.
7. Graduates can elicit and write software specifications.
8. Graduates understand principles of software quality assurance and testing, and can test software effectively.