Computer Science, BS

Program Description

This program provides students with a broad understanding of the principles and practice of Computer Science, with the craft of programming emphasized as a central tool both for pedagogy (learning by doing) and for preparation for professional practice. Students study fundamental topics in software, hardware, and theory, as well as in-depth subjects such as artificial intelligence, graphics, compilers, and distributed systems.

Program Curriculum

120 credits

Utah Tech General Education Requirements

All Utah Tech General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to Utah Tech's minimum General Education standards in American Institutions, English, and Mathematics.

General Education Core Requirements (https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)

Code	Title	Hours
English		3-7
Mathematics		3-5
American Institutions		3-6
Life Sciences		3-10
Physical Sciences		3-5
Fine Arts		3
Literature/Humanities		3
Social & Behavioral Sciences		3

Code	Title	Hours
Computer Science Core Requirements		
CS 1400	Fundamentals of Programming	3
CS 1410	Object Oriented Programming	3
CS 2420	Introduction to Algorithms and Data Structures	3
CS 2450	Software Engineering	3
CS 2810	Computer Organization and Architecture	3
CS 3005	Programming in C++	3
CS 3530	Computational Theory	3
CS 3510	Algorithms	3
CS 4600	Senior Project	3
Complete at least seven (7) courses from the following:		
CS 3150	Computer Networks	3
CS 3400	Operating Systems	3
CS 3410	Distributed Systems	3
CS 3520	Programming Languages	3
CS 3600	Graphics Programming	3
CS 4300	Artificial Intelligence	3
CS 4307	Database Systems	3
CS 4320	Machine Learning	3
CS 4550	Compilers	3
SE 3200	Web Application Development I	3
Math Core Requirements		
MATH 1210	Calculus I (MA)	4
MATH 3400	Probability & Statistics	3

CS 2100	Discrete Structures	3
Complete at least two (2) courses from the following:		
MATH 1220	Calculus II (MA)	4
MATH 2210	Multivariable Calculus (MA)	4
MATH 2250	Differential Equations and Linear Algebra	4
MATH 2270	Linear Algebra	3
MATH 2280	Ordinary Differential Equations	3
MATH 3050	Stochastic Modeling and Applications	3
MATH 3450	Statistical Inference	3
MATH 3605	Introduction to Modeling and Simulation	3
MATH 3905	Cryptography and Codes	3
MATH 4005	Quantum Computing and Cryptography	3
Science Core Requirement		
Complete one (1) course with lab from the following:		
BIOL 1610 & BIOL 1615	Principles of Biology I (LS) and Principles of Biology I Lab (LAB)	5
CHEM 1210 & CHEM 1215	Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)	5
PHYS 2210 & PHYS 2215	Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab	5
Computer Science Elective Requirements		
Complete at least nine (9) credits from the following:		
CS 3150	Computer Networks	3
CS 3400	Operating Systems	3
CS 3410	Distributed Systems	3
CS 3500	Game Development	3
CS 3520	Programming Languages	3
CS 3600	Graphics Programming	3
CS 4300	Artificial Intelligence	3
CS 4307	Database Systems	3
CS 4320	Machine Learning	3
CS 4400	Data Mining	3
CS 4410	Data Visualization	3
CS 4550	Compilers	3
CS 4800R	Undergraduate Research (up to 6 credits)	1-3
CS 4920R	Internship	1-3
CS 4990	Special Topics in Computer Science	0.5-3
CS 4991R	Competitive Programming	0.5
CS 4992R	Computer Science Seminar (up to 4 credits)	1
IT 1100	Introduction to Unix/Linux	3
IT 2700	Information Security	3
IT 3100	Systems Design and Administration	3
IT 3110	System Automation	3
IT 4200	DevOps Lifecycle Management	3
SE 1400	Web Design Fundamentals (ALCS)	3
SE 3010	Mobile Application Development for Android	3
SE 3020	Mobile Application Development for iOS	3
SE 3100	Software Practices	3
SE 3200	Web Application Development I	3
SE 3150	Software Quality	3
SE 3250	Internet of Things Programming	3
SE 3400	Human-Computer Interaction	3
SE 3450	User Experience Design	3

SE 4200	Web Application Development II	3
SE 4930R	Software Entrepreneurial Exploration	3

NOTE: *A course may only be used to fulfill one program requirement. Dual-listed courses may only be used once to fill requirements. Consult course descriptions in the current catalog to verify dual-listed courses.*

Graduation Requirements

1. Complete a minimum of 120 college-level credits (1000 and above).
2. Complete at least 40 upper-division credits (3000 and above).
3. Complete at least 30 upper-division credits at Utah Tech for institutional residency.
4. Cumulative GPA 2.0 or higher.
5. Grade C or higher in each Core Requirement and Elective Requirement course.

Graduation Plan

1st Year

Fall Semester	Hours	Spring Semester	Hours
First Year Recommended Elective	2	ENGL 2010	3
CS 1400	3	CS 1410	3
ENGL 1010 or 1010D	3	CS 2810	3
MATH 1210	4	BIOL 1610 (meets General Education (Life Sciences))	4
General Elective	3	BIOL 1615	1
Milestones & Notes: Meet with your program advisor. Maintain minimum prerequisite and program grade requirements.		Milestones & Notes: Meet with your program advisor. Maintain minimum prerequisite and program grade requirements.	
	15		**14**

2nd Year

Fall Semester	Hours	Spring Semester	Hours
CS 2420	3	CS 2100	3
CS 2450	3	CS 3005	3
MATH 3400	3	CS Core Elective 1 of 7 courses (CS 4307)	3
CS Elective 1 of 3 credits (SE 1400)	3	General Education (Physical Science) (https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
General Education (American Institutions) (https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	Milestones & Notes: Meet with your program advisor. Maintain minimum prerequisite and program grade requirements.	
Milestones & Notes: Meet with your program advisor. Maintain minimum prerequisite and program grade requirements.			
	15		**12**

3rd Year

Fall Semester	Hours	Spring Semester	Hours
CS 3530	3	CS 3510	3
CS Core Elective 2 of 7 courses (CS 3520)	3	CS Core Electives 4 of 7 courses (CS 3150)	3

CS Core Elective 3 of 7 courses (CS 3400)	3	CS Elective 2 of 3 courses	3
General Education (Fine Arts) (https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	General Education (Lit/Humanities) (https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
General Elective	4	General Elective	3
Milestones & Notes: Meet with your program advisor. Maintain minimum prerequisite and program grade requirements.		Milestones & Notes: Meet with your program advisor. Maintain minimum prerequisite and program grade requirements.	
	16		**15**

4th Year

Fall Semester	**Hours**	**Spring Semester**	**Hours**
CS Core Elective 5 of 7 courses (SE 3200)	3	CS 4600	3
CS Core Elective 6 of 7 courses (CS 4300)	3	CS Core Elective 7 of 7 courses (CS 3410)	3
CS Elective 3 of 3 courses	3	MATH 2270	3
General Education (Social/Behavioral) (https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	General Elective	3
General Elective	3	General Elective	3
Milestones & Notes: Apply for graduation (SPRING DEADLINE NOV. 1, FALL DEADLINE APR. 1). Meet with your program advisor. Maintain minimum prerequisite and program grade requirements.		Milestones & Notes: Double check with advisor for final classes. Maintain minimum program grade requirements. Congratulations!	
	15		**15**

Total Hours 117

BS Computer Science Program Learning Outcomes

At the successful conclusion of this program, students will be able to:

1. Design, implement, and evaluate computational systems to address needs in a variety of contexts and disciplines.
2. Devise new solutions from foundational principles informed by current practice.
3. Weigh and apply ethical, legal, and social responsibilities in all aspects of practice.
4. Construct effective solutions in teams to accomplish a common goal.
5. Author effective visual, oral, and written communication for a range of audiences.