Computer Engineering, BS

Program Description

The Bachelor of Science Degree in Computer Engineering teaches students the necessary skills to design, analyze, and build electromechanical systems. Computer engineering is a field that includes elements of computer science, electrical engineering, software development, and mechanical engineering. Computer engineering emphasizes hardware integration with software or electrical systems. Although similar to electrical engineering, computer engineering provides more teaching in the areas of programming, sensors, and actuators. A student with a degree from this program will be well prepared to pursue an advanced degree in engineering or computer science or to pursue a technical career in industrial and technological environments.

Professional Licensure/Certification (PLC) Requirements

The curriculum for programs at Utah Tech University leading to professional licensure are designed to prepare students for Utah licensure and certification requirements. Admission into programs for professions requiring licensure and certification does not guarantee that students will obtain a license or certificate. Licensure and certification requirements are set by agencies that are not controlled by or affiliated with the University, and licensure and certification requirements can change at any time.

Licensure boards in each state establish requirements for licensure and certification for their respective state. States vary by which professions are required to be licensed and how licensure functions, and such requirements may change at any time. The terms related to licensure and certification, among others, also vary by state as well.

Students and prospective students are strongly encouraged to contact the state licensure entity in the state where they intend to work to review all licensure and certification requirements imposed by the student's state(s) of choice. The University cannot provide verification of a student's ability to meet licensure or certification requirements unrelated to its educational programming. Some states require individuals to complete additional requirements that are unrelated to educational prerequisites. For more information, visit the State Authorization and Professional Licensure (https://academics.utahtech.edu/state-authorization/) web page and select the program, or speak to the director of the program.

Utah Tech University shall not be held liable if a student is unable to qualify for licensure or certification in any jurisdiction.

This disclosure is made pursuant to 34 CFR §668.43(a)(5)(v)(C).

Admission Requirements

The admissions process works as follows:

1. Student applies and is accepted to Utah Tech
2. Student designates their major as Pre-Engineering (pursuing Associate of Pre-Engineering)
3. Student passes the following courses with a C- or better:
    - CS 1400
    - CS 1410
    - MATH 1210
    - MATH 1220
    - PHYS 2210
    - PHYS 2215
1. Student meets with the engineering advisor to ensure that required courses are complete and to make an academic plan
2. Student's major is switched from Pre-Engineering to Computer Engineering

Program Curriculum

125.5 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 (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

* General Elective must be fulfilled with either a BIOL or CHEM GE course to meet ABET accreditation requirement for 30 credits of math and science.

Computer Engineering Required Courses

Code	Title	Hours
ENGL 3010	Professional Writing and Business Ethics (Prerequisites: ENGL 1010 and ENGL 2010, or equivalent placement score)	3
MATH 1210	Calculus I (MA) (Prerequisites: MATH 1010 and MATH 1050 and MATH 1060 or MATH 1080, or equivalent placement score)	4
MATH 1220	Calculus II (MA)	4
MATH 2250	Differential Equations and Linear Algebra	4
MATH 3400	Probability & Statistics	3
PHYS 2210 & PHYS 2215	Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab	5
PHYS 2220 & PHYS 2225	Physics/Scientists EngineersII and Physics/Scientists Engineers II Lab	5
CS 1400	Fundamentals of Programming	3
CS 1410	Object Oriented Programming	3
CS 2100	Discrete Structures	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 3410	Distributed Systems	3
CS 3400	Operating Systems	3
MECH 2210 & MECH 2215	Circuits and Circuits Lab	4
MECH 2250 & MECH 2255	Sensors & Actuators and Sensors & Actuators Lab	4
MECH 3200 & MECH 3205	Systems & Controls and Systems & Controls Lab	3.5
ECE 1200	Intro to Microcontrollers	1
ECE 2700 & ECE 2705	Digital Circuits and Digital Circuits Lab	4

ECE 2280 & ECE 2285	Microelectronics and Microelectronics Lab	4
ECE 3730 & ECE 3735	Embedded Systems I and Embedded Systems I Lab	4
ECE 3500	Signals and Systems	3
ECE 4730 & ECE 4735	Embedded Systems II and Embedded Systems II Lab	4
ECE 4005	CE Product Design I	3
ECE 4015	CE Product Design II	3

Computer Engineering Tech Elective Courses

Code	Title	Hours
Complete 12 credits from the following:		
Any ECE 4xxx (excluding ECE 4000, 4005, 4010, 4015, 4500)		
Any MECH 4xxx (excluding MECH 4000, 4010)		
Any MTRN 4xxx (excluding MTRN 4000, 4010)		
NOTE: Only 3 credits may be from research and design practicum (ECE 4800R, MECH 4800R, MECH 4860R)		
NOTE: 3 credits must have an ECE prefix (excludes research and design practicum)		
NOTE: All other courses require approval from the Engineering Department		

Graduation Requirements

1. Complete a minimum of 125.5 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 all Computer Engineering Required Courses and Tech Elective Courses.
6. Pass the Fundamentals of Engineering (FE) Exam

Graduation Plan - 4 years

1st Year

Fall Semester	Hours	Spring Semester	Hours
MATH 1210	4	MATH 1220	4
CS 1400	3	CS 1410	3
ENGL 2010	3	PHYS 2210 & PHYS 2215	5
GE Life Sciences	3	GE Literature/Humanities	3
General Elective (CHEM or BIOL course)	3		
	16		**15**

2nd Year

Fall Semester	Hours	Spring Semester	Hours
CS 2420	3	CS 2450	3
MECH 2210 & MECH 2215	4	MECH 2250 & MECH 2255	4
PHYS 2220 & PHYS 2225	5	MATH 2250	4
ECE 2700 & ECE 2705	4	ECE 2280 & ECE 2285	4
ECE 1200	1		
	17		**15**

3rd Year

Fall Semester	Hours	Spring Semester	Hours
MECH 3200 & MECH 3205	3.5	CS 3410	3
ECE 3730 & ECE 3735	4	ECE 3500	3
CS 2810	3	ENGL 3010	3
CS 3005	3	ECE 4730 & ECE 4735	4
MATH 3400	3	Tech Elective 1	3
	16.5		**16**

4th Year

Fall Semester	Hours	Spring Semester	Hours
ECE 4005	3	ECE 4015	3
Tech Elective 2	3	ECE 4500	3
CS 3400	3	Tech Elective 3	3
CS 2100	3	GE - American Institutions	3
GE Fine Arts	3	GE - Social and Behavioral Sciences	3
	15		**15**

Total Hours 125.5

Graduation Plan - 5 years (MATH 1010)

1st Year

Fall Semester	Hours	Spring Semester	Hours
MATH 1010	4	MATH 1080	5
ENGL 1010	3	ENGL 2010	3
General Education (Life Science) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	CS 1400	3
General Education (American Institutions) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	General Education (Fine Arts) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
	13		**14**

2nd Year

Fall Semester	Hours	Spring Semester	Hours
ECE 2700 & ECE 2705	4	CS 2420	3
CS 1410	3	PHYS 2210 & PHYS 2215	5
ECE 1200	1	MATH 1220	4
MATH 1210	4		
General Elective	3		
	15		**12**

3rd Year

Fall Semester	Hours	Spring Semester	Hours
MECH 2210 & MECH 2215	4	MECH 2250 & MECH 2255	4
CS 3005	3	ECE 2280 & ECE 2285	4
PHYS 2220 & PHYS 2225	5	CS 2450	3

		MATH 2250	4
	12		**15**

4th Year

Fall Semester	Hours	Spring Semester	Hours
ECE 3730 & ECE 3735	4	ECE 4730 & ECE 4735	4
MECH 3200 & MECH 3205	3.5	ECE 3500	3
CS 2810	3	CS 3410	3
MATH 3400	3	Tech Elective 1	3
	13.5		**13**

5th Year

Fall Semester	Hours	Spring Semester	Hours
ECE 4005	3	ECE 4015	3
CS 3400	3	ECE 4500	3
Tech Elective 2	3	Tech Elective 3	3
ENGL 3010	3	General Education (Lit / Humanities) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
CS 2100	3	General Education (Social & Behavioral Sciences) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
	15		**15**

Total Hours 137.5

Graduation Plan - 5 years (MATH 1050)

1st Year

Fall Semester	Hours	Spring Semester	Hours
MATH 1050	4	MATH 1060	3
ENGL 1010	3	CS 1410	3
CS 1400	3	ENGL 2010	3
General Education (American Institutions) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	General Elective	3
		General Education (Life Science) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
	13		**15**

2nd Year

Fall Semester	Hours	Spring Semester	Hours
ECE 2700 & ECE 2705	4	CS 2450	3
ECE 1200	1	PHYS 2210 & PHYS 2215	5
CS 2420	3	MATH 1220	4
MATH 1210	4		
	12		**12**

3rd Year

Fall Semester	Hours	Spring Semester	Hours
MECH 2210 & MECH 2215	4	MECH 2250 & MECH 2255	4
CS 3005	3	ECE 2280 & ECE 2285	4
PHYS 2220 & PHYS 2225	5	MATH 2250	4
CS 2100	3	General Education (Fine Arts) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
	15		**15**

4th Year

Fall Semester	Hours	Spring Semester	Hours
ECE 3730 & ECE 3735	4	ECE 4730 & ECE 4735	4
MECH 3200 & MECH 3205	3.5	ECE 3500	3
CS 2810	3	CS 3410	3
MATH 3400	3	Tech Elective 1	3
	13.5		**13**

5th Year

Fall Semester	Hours	Spring Semester	Hours
ECE 4005	3	ECE 4015	3
CS 3400	3	ECE 4500	3
ENGL 3010	3	Tech Elective 3	3
Tech Elective 2	3	General Education (Lit / Humanities) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
General Education (Social & Behavioral Science) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3		
	15		**12**

Total Hours 135.5

BS Computer Engineering BS Program Learning Outcomes

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

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. 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. Communicate effectively with a range of audiences.
4. 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. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.