

# Mechanical Engineering, BS

---

## Program Description

The Bachelor of Science Degree in Mechanical Engineering will provide students with analytical and hands-on education in the areas of design and manufacturing, mechatronics, solid-mechanics, thermofluids, mathematics, physics, and chemistry. Mechanical engineering is the broadest of all engineering disciplines and thus provides flexibility in terms of employment and pursuit of advanced degrees. The degree will prepare students to pursue either advanced degrees in engineering, science, or computer science disciplines or careers in various fields including product design, manufacturing, aerospace, robotics, transportation, energy production, automotive, biomedical, and environmental systems.

## 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

Students are required to meet with the Mechanical Engineering advisor and obtain a grade of C- or better in the following courses:

Code	Title	Hours
MECH 1000	Introduction to Design & Rapid Prototyping	3
MECH 1100	Manufacturing Processes	3
MECH 1200	Coding	3
MECH 1205	Coding Lab	1
CHEM 1210	Principles of Chemistry I (PS)	4
CHEM 1215	Principles of Chemistry I Lab (LAB)	1
MATH 1210	Calculus I (MA)	4
MATH 1220	Calculus II (MA)	4
PHYS 2210	Physics/Scientists Engineers I (PS)	4
PHYS 2215	Physics/Scientists Engineers I Lab (LAB)	1

## 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](http://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
Exploration		3-5

### Mechanical Engineering Required Courses

Code	Title	Hours
ENGL 3010	Professional Writing and Business Ethics	3
MATH 1210	Calculus I (MA)	4
MATH 1220	Calculus II (MA)	4
MATH 2210	Multivariable Calculus (MA)	4
MATH 2250	Differential Equations and Linear Algebra	4
MATH 3500	Numerical Analysis	3
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 (LAB)	5
PHYS 2220 & PHYS 2225	Physics/Scientists EngineersII and Physics/Scientists Engineers II Lab	5
MECH 1000 & MECH 1005	Introduction to Design & Rapid Prototyping and Introduction to Design & Rapid Prototyping Lab	3
MECH 1100	Manufacturing Processes	3
MECH 1150	Prototyping Techniques	2
MECH 1200 & MECH 1205	Coding and Coding Lab	4
MECH 2010	Statics	3
MECH 2030	Dynamics	3
MECH 2160	Materials Science	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
MECH 3250 & MECH 3255	Machinery and Machinery Lab	4
MECH 3300 & MECH 3305	Strength of Materials and Strength of Materials Lab	3.5
MECH 3600 & MECH 3605	Thermodynamics and Thermodynamics Lab	4.5

MECH 3650 & MECH 3655	Heat Transfer and Heat Transfer Lab	3.5
MECH 3700 & MECH 3705	Fluid Mechanics and Fluid Mechanics Lab	4.5
MECH 4000	Product Design I	3
MECH 4010	Product Design II	3

## Mechanical Engineering Tech Elective Courses

Code	Title	Hours
Complete 12 credits from the following:		12
Any MECH 4xxx (excluding MECH 4000, 4010)		
Any ECE 4xxx (excluding ECE 4000, 4005, 4010, 4015)		
Any MTRN 4xxx (excluding MTRN 4000, 4010)		
NOTE: Only 3 credits may be from research and design practicum (MECH 4800R, MECH 4860R, ECE 4800R)		
NOTE: 6 credits must have a MECH 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 Mechanical 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
CHEM 1210 & CHEM 1215	5 MATH 1220	4
MATH 1210	4 MECH 1200 & MECH 1205	4
MECH 1000 & MECH 1005	3 MECH 2160	3
MECH 1100	3 PHYS 2210 & PHYS 2215	5
	<b>15</b>	<b>16</b>

### 2nd Year

Fall Semester	Hours Spring Semester	Hours
MATH 2210	4 MATH 2250	4
MECH 2210 & MECH 2215	4 MECH 2030	3
MECH 1150	2 MECH 2250 & MECH 2255	4
MECH 2010	3 MECH 3600 & MECH 3605	4.5
PHYS 2220 & PHYS 2225	5	
	<b>18</b>	<b>15.5</b>

**3rd Year**

<b>Fall Semester</b>	<b>Hours Spring Semester</b>	<b>Hours</b>
MATH 3500	3 ENGL 2010	3
MECH 3200 & MECH 3205	3.5 General Education (Fine Arts) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
MECH 3300 & MECH 3305	3.5 MECH 3250 & MECH 3255	4
MECH 3700 & MECH 3705	4.5 MECH 3650 & MECH 3655	3.5
	Tech Elective 1	3
	<b>14.5</b>	<b>16.5</b>

**4th Year**

<b>Fall Semester</b>	<b>Hours Spring Semester</b>	<b>Hours</b>
ENGL 3010	3 General Education (Literature/ Humanities) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
General Education (Social & Behavioral Sciences) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3 General Education (Life Sciences) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
MECH 4000	3 General Education (American Institutions) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
Tech Elective 2	3 MECH 4010	3
Tech Elective 3	3 Tech Elective 4	3
FE Exam		
	<b>15</b>	<b>15</b>

**Total Hours 125.5****Graduation Plan - 5 years (MATH 1010)****1st Year**

<b>Fall Semester</b>	<b>Hours Spring Semester</b>	<b>Hours</b>
MATH 1010	4 MECH 1200 & MECH 1205	4
MECH 1000 & MECH 1005	3 ENGL 2010	3
MECH 1100	3 MATH 1080	5
ENGL 1010	3	
General Education (Life Science) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	
	<b>16</b>	<b>12</b>

**2nd Year**

<b>Fall Semester</b>	<b>Hours Spring Semester</b>	<b>Hours</b>
MECH 1150	2 MECH 2160	3
CHEM 1210 & CHEM 1215	5 PHYS 2210 & PHYS 2215	5
MATH 1210	4 MATH 1220	4

General Education (American Institutions) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	
--	---	--

**14****12****3rd Year****Fall Semester**MECH 2210  
& MECH 2215

MECH 2010

PHYS 2220  
& PHYS 2225

MATH 2210

**Hours Spring Semester**4 MECH 2250  
& MECH 22553 MECH 3600  
& MECH 3605

5 MECH 2030

4 MATH 2250

**Hours**

4

4.5

3

4

**16****15.5****4th Year****Fall Semester**MECH 3200  
& MECH 3205MECH 3700  
& MECH 3705MECH 3300  
& MECH 3305

MATH 3500

**Hours Spring Semester**3.5 MECH 3250  
& MECH 32554.5 MECH 3650  
& MECH 3655

3.5 General Education (Fine Arts) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)

3 General Education (Social &amp; Behavioral Science) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)

**Hours**

4

3.5

3

3

**14.5****13.5****5th Year****Fall Semester**

MECH 4000

Tech Elective 1

Tech Elective 2

FE Exam

ENGL 3010

**Hours Spring Semester**

3 MECH 4010

3 Tech Elective 3

3 Tech Elective 4

General Education (Lit &amp; Humanities) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)

3

**Hours**

3

3

3

3

**12****12****Total Hours 137.5****Graduation Plan - 5 years (MATH 1050)****1st Year****Fall Semester**

MATH 1050

MECH 1000  
& MECH 1005

MECH 1100

ENGL 1010

**Hours Spring Semester**4 MECH 1200  
& MECH 1205

3 ENGL 2010

3 MATH 1060

3 CHEM 1210  
& CHEM 1215**Hours**

4

3

3

5

**13****15**

**2nd Year**

<b>Fall Semester</b>	<b>Hours Spring Semester</b>	<b>Hours</b>
MECH 1150	2 MECH 2160	3
MATH 1210	4 PHYS 2210 & PHYS 2215	5
General Education (American Institutions) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3 MATH 1220	4
General Education (Life Science) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	
	<b>12</b>	<b>12</b>

**3rd Year**

<b>Fall Semester</b>	<b>Hours Spring Semester</b>	<b>Hours</b>
MECH 2210 & MECH 2215	4 MECH 2250 & MECH 2255	4
MECH 2010	3 MECH 3600 & MECH 3605	4.5
PHYS 2220 & PHYS 2225	5 MECH 2030	3
MATH 2210	4 MATH 2250	4
	<b>16</b>	<b>15.5</b>

**4th Year**

<b>Fall Semester</b>	<b>Hours Spring Semester</b>	<b>Hours</b>
MECH 3200 & MECH 3205	3.5 MECH 3250 & MECH 3255	4
MECH 3700 & MECH 3705	4.5 MECH 3650 & MECH 3655	3.5
MECH 3300 & MECH 3305	3.5 General Education (Fine Arts) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
MATH 3500	3 General Education (Social & Behavioral Science) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
	<b>14.5</b>	<b>13.5</b>

**5th Year**

<b>Fall Semester</b>	<b>Hours Spring Semester</b>	<b>Hours</b>
MECH 4000	3 MECH 4010	3
Tech Elective 1	3 Tech Elective 3	3
Tech Elective 2	3 Tech Elective 4	3
FE Exam	General Education (Lit & Humanities) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
ENGL 3010	3	
	<b>12</b>	<b>12</b>

**Total Hours 135.5****BS Mechanical Engineering 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.