Mechatronics, BS

Program Description

The Mechatronics degree prepares students for careers in the fields of measurement, control, robotics, and automation. Students will learn fundamentals of integrating electronic and mechanical components and control systems to create automated processes. Graduates will have a broad range of skills across multiple traditional engineering disciplines and will therefore be capable of selecting components and programming controls such as those seen in a variety of automated systems. Example environments where graduates will be able to work include automated manufacturing and industrial settings or assisting in the design of vehicles that have mechanical components capable of responding to sensor feedback. This program provides students with hands-on experiences in electrical controls; PLC programming; industrial, mechanical, and fluid power systems; robotics; and other technologies that are relevant to automated processes and electromechanical systems.

Admission Requirements

Students are required to meet with a program advisor and complete the required courses with a 2.5 or higher GPA in the following courses:

Code	Title	Hours
MATH 1080	Pre-Calculus with Trigonometry (MA)	5
or MATH 1050 & MATH 1060	College Algebra / Pre-Calculus (MA) and Trigonometry (MA)	
MECH 1000	Introduction to Design & Rapid Prototyping	3
MECH 1100	Manufacturing Processes	3
MECH 1200	Coding	3

Program Curriculum

121.5 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

Mechatronics Required Courses

Code	Title	Hours
ENGR 2050	Fundamentals of Engineering Mathematics	3
MECH 1150	Prototyping Techniques	2
MECH 1205	Coding Lab	1
MECH 2010	Statics	3
MECH 2210 & MECH 2215	Circuits and Circuits Lab	4
MECH 2250 & MECH 2255	Sensors & Actuators and Sensors & Actuators Lab	4

MTRN 2200 & MTRN 2205	Industrial Wiring for Automated Systems and Industrial Wiring for Automated Systems Lab	3
MTRN 2300 & MTRN 2305	Introduction to Programmable Logic Controllers and Introduction to Programmable Logic Controllers Lab	4
MTRN 2350 & MTRN 2355	Advanced PLC Programming and Applications and Advanced PLC Programming and Applications Lab	4
MTRN 2400	Mechanical Components	4
MTRN 3360 & MTRN 3365	Industrial Robots and Industrial Robots Lab	3
MTRN 3500 & MTRN 3505	Motion Control in Mechatronic Systems and Motion Control in Mechatronic Systems Lab	4
MTRN 3560 & MTRN 3565	Industrial Motor Controls and Industrial Motor Controls Lab	4
MTRN 3400 & MTRN 3405	Fluid Power Systems and Fluid Power Systems Lab	3
MTRN 3600 & MTRN 3605	Industrial Networks and Industrial Networks Lab	3
MTRN 4000	Product Design I	3
MTRN 4010	Product Design II	3
MTRN 4600 & MTRN 4605	Advanced Mechatronic System Design and Advanced Mechatronic System Design Lab	3
PHYS 2010 & PHYS 2015	College Physics I (PS) and College Physics I Lab	5
PHYS 2020 & PHYS 2025	College Physics II and College Physics II Lab	5
Total Hours		**68**

Mechatronics Tech Elective Courses

Code	Title	Hours
Complete 15 credits from the following:		15
Any MTRN 4xxx (excluding MTRN 4000,4010,4600,4605)		
Any MECH 4xxx (excluding MECH 4000,4010)		
Any ECE 4xxx (excluding ECE 4000,4005,4010,4015)		
NOTE: Only 3 credits may be from research and design practicum (MECH 4800R, MECH 4860R, ECE 4800R)		
NOTE: All other courses require approval from the Engineering Department		

GRADUATION REQUIREMENTS

1. Complete a minimum of 122.5 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 Mechatronics Required Courses and Tech Elective Courses.

Graduation Plan

1st Year

Fall Semester	Hours	Spring Semester	Hours
MECH 1000 & MECH 1005	3	MECH 1200 & MECH 1205	4
MECH 1100	3	MECH 1150	2
ENGL 1010	3	ENGL 2010	3

Fall Semester	Hours	Spring Semester	Hours
General Education (Literature/Humanities) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	MATH 1080 (MATH 1010 Pre-requisite)	5
General Education (Social & Behavioral Sciences) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3		
	15		**14**

2nd Year

Fall Semester	Hours	Spring Semester	Hours
MECH 2210 & MECH 2215	4	MECH 2250 & MECH 2255	4
MTRN 2300 & MTRN 2305	4	MTRN 2350 & MTRN 2355	4
MTRN 2200 & MTRN 2205	3	PHYS 2010 & PHYS 2015	5
ENGR 2050	3	General Elective (CHEM or BIOL)	3
	14		**16**

3rd Year

Fall Semester	Hours	Spring Semester	Hours
MTRN 3360 & MTRN 3365	3	MTRN 3560 & MTRN 3565	4
MECH 2010	3	MTRN 3400 & MTRN 3405	3
MTRN 2400	4	General Education (Fine Arts) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
PHYS 2020 & PHYS 2025	5	Tech Elective	3
		Tech Elective	3
	15		**16**

4th Year

Fall Semester	Hours	Spring Semester	Hours
MTRN 4000	3	MTRN 4010	3
MTRN 3600 & MTRN 3605	3	MTRN 3500 & MTRN 3505	4
MTRN 4600 & MTRN 4605	3	Tech Elective	3
Tech Elective	3	Tech Elective	3
General Education (Life Sciences) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3	General Education (American Institutions) (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)	3
	15		**16**

Total Hours 121

BS Mechatronics Program Learning Outcomes

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

1. To apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline;
2. To design solutions for well-defined technical problems and assist with the engineering design of systems, components, or processes appropriate to the discipline;

3. To apply written, oral, and graphical communication in well-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;
4. To conduct standard tests, measurements, and experiments and to analyze and interpret the results;
5. To function effectively as a member of a technical team.