Engineering Technology

Engineering Technology

The Engineering Technology department is in the Scott M. Smith College of Engineering. To find the most up-to-date information, including Program Learning Outcomes for degree programs offered by the Engineering Technology department, visit their website.

Engineering Technology department

DEPARTMENT CHAIR

LUNDAHL, Diana *Associate Professor*

FACULTY

AL-NSOUR, Rawan *Assistant Professor*
BIRD, Tyler *Assistant Professor*
ELBERT, Mike *Assistant Professor*
FRAME, David W. *Assistant Professor*
FRAUGHTON, Travis *Lecturer*
HAKALA, Tim *Assistant Professor*
HAWKER, John *Lecturer*
LUNDAHL, Diana *Associate Professor*
PARKER, Trever *Lecturer*
SEARLE, Scott *Lecturer*

Degrees & Programs

Automation and Electrical Technology, A.S.

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Requirements

The EART program prepares Electrical Automation Technicians to troubleshoot, wire, repair, adapt, maintain, program (PLC's & PAC's), and control large automated electrical systems found in Industrial and Manufacturing Industries worldwide. The EART Technician will work with DC & AC motor controlled machines; Programmable Logic Controlled (PLC's) and Programmable Automation Controlled (PAC's) machines, systems, and devices; Hydraulic and pneumatic controlled machines; conveyor, fluid, and bulk storage systems; flex, soft start, and variable frequency drives; Robots; servo, and stepper motors. Because of their highly skilled hands on training the EART student is in high demand from many industries.

Total Program Credits: 60

General Education Requirements:			35 Credits
	ENGL 1010	Introduction to Academic Writing CC	3
or	ENGH 1005	Literacies and Composition Across Context CC (5.0)	
	ENGL 2010	Intermediate Academic Writing CC	3
Complete one of the following:			3
	MAT 1030	Quantitative Reasoning QL (3.0)	
	MAT 1035	Quantitative Reasoning with Integrated Algebra QL (6.0)	
	STAT 1040	Introduction to Statistics QL (3.0)	
	STAT 1045	Introduction to Statistics with Algebra QL (5.0)	
	MATH 1050	College Algebra QL (4.0)	
	MATH 1055	College Algebra with Preliminaries QL (5.0)	
	MATH 1090	College Algebra for Business QL (3.0)	
Complete one of the following:			3
	HIST 2700	US History to 1877 AS (3.0)	
and	HIST 2710	US History since 1877 AS (3.0)	
	HIST 1700	American Civilization AS (3.0)	
	HIST 1740	US Economic History AS (3.0)	
	POLS 1000	American Heritage SS (3.0)	
	POLS 1100	American National Government AS (3.0)	
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 (2.0)	
Distribution Courses:			
	Biology		3
	Physical Science		3
	Additional Biology or Physical Science		3
	Humanities Distribution		3
	Fine Arts Distribution		3
	Social/Behavioral Science		3
Discipline Core Requirements:			16 Credits
	Choose from AET or related courses (1000 level or higher)		16
Elective Requirements:			9 Credits
	Electives (1000 level or higher)		9

Graduation Requirements:

1. Completion of a minimum of 60 semester credits.
2. Overall grade point average of 2.0 (C) or above with no core course below a C-.
3. Residency hours-- minimum of 20 credit hours through course attendance at UVU.
4. Completion of GE and specified departmental requirements.

Automation and Electrical Technology, A.S.
Careers

1. EART Students will be able to troubleshoot, install, program and maintain equipment used in an automated process.

Related Careers

- Electro-Mechanical Technicians

Automation and Electrical Technology, A.A.S.

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Requirements

Prepares graduates to troubleshoot, wire, repair, adapt, maintain, integrate, install, analyze, and program industrial automated equipment and electrical systems found in automated manufacturing and other industries. Focuses heavily on troubleshooting, motor controls and drives, industrial electronics, sensors, programmable logic controllers (PLCs) and integration of industrial internet of things *(IIOT) from the plant floor to the human machine interface (HMI).

Teaches single and three phase electrical systems in conjunction with industrial automation and intelligent electronics devices found in both industrial automation and electrical power. Numerous career path options are available for graduates.

Total Program Credits: 65

General Education Requirements:			14 Credits
	ENGL 1010	Introduction to Academic Writing CC	3
or	ENGH 1005	Literacies and Composition Across Contexts CC (5.0)	
	Any approved Humanities or Fine Art		3
	Any approved Behavioral Science, Social, or Political Science Distribution Course		3
	Any approved Physical Education, Health, Safety, or Environment Course		2
	Any approved Biology or Physical Science		3
Discipline Core Requirements:			51 Credits
	AET 1050	Electrical Math I	3
	AET 1060	Electrical Math II	3
	AET 1130	Introduction to Automation	2
	AET 1135	Introduction to Automation Lab	1
	AET 1140	Applied AC Theory	1
	AET 1145	Applied AC Lab	2
	AET 1150	Industrial Logic	1
	AET 1155	Industrial Logic Lab	1
	AET 1250	Industrial Electrical Code	2
	AET 1280	Electric Motor Control	4
	AET 1285	Electric Motor Control Lab	4
	AET 2110	Industrial Electronics I	4
	AET 2115	Industrial Electronics I Lab	2
	AET 2250	Industrial Programmable Logic Controllers--PLCs	4
	AET 2255	Industrial Programmable Logic Controllers--PLCs Lab	2
	EGDT 1040	Fundamentals of Technical Engineering Drawing	3
or	EGDT 1071	3 Dimensional Modeling--Solidworks	
Choose 12 Credits from the Following Options:			12
	AET 2010	Manufacturing Technology (1)	
	AET 2015	Manufacturing Technology Lab (2)	
	AET 2150	Introduction to Fluid Power Systems (2)	
	AET 2155	Introduction to Fluid Power Systems Lab (1)	
	AET 2160	Introduction to Industrial Internet of Things (2)	
	AET 2165	Introduction to Industrial Internet of Things Lab (1)	
	AET 2270	Industrial Programmable Automation Controllers--PACs (2)	
	AET 2275	Industrial Programmable Automation Controllers--PACs Lab (1)	
	AET 2280	Process Control Instrumentation (2)	
	AET 2285	Process Control Instrumentation Lab (1)	
	AET 281R	Cooperative Work Experience (1)	
	AET 2900	Capstone Project (3)	
	AET 291R	Special Topics in Industrial Systems (3)	
	AET 285R	Cooperative Correlated Class (variable)	
	EGDT 1200	Mechanical Drafting and Design (3)	
	MECH 2300	Microcontroller Architecture and Programming (3)	
	MECH 2305	Microcontroller Architecture and Programming Lab (2)	

Graduation Requirements:

1. Completion of a minimum of 65 semester credits
2. Overall grade point average of 2.0 (C) or above, with no core course below a 'C-'.
3. Residency hours: minimum of 20 credit hours through course attendance at UVU
4. Completion of GE and specified departmental requirements

Automation and Electrical Technology, A.A.S.

Careers

Program Learning Outcomes
1. Apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to safely solve well-defined problems related to electrical and automation systems. 2. Apply solutions for well-defined technical problems and assist with the engineering design, integration, repair, testing, troubleshooting, and installation of systems, components, or processes related to electrical and automation systems 3. Apply written, oral, and graphical communication in well-defined technical and non-technical environments 4. Identify and use appropriate technical literature to solve problems, integrate, and troubleshoot electrical automation systems 5. Safely conduct standard tests, measurements, and experiments and analyze and interpret the results 6 6. Function effectively as a member of a technical team.

Related Careers

- Electro-Mechanical Technicians

Mechatronics Engineering Technology, A.A.S.

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Requirements

The Mechatronics Engineering Technology Degree from Utah Valley University prepares graduates to work in the Utah manufacturing sector as an automation technologist, design technician, PLC programmer, as well as many other aspects of implementing manufacturing systems. Students complete courses in PLC programming and architecture, materials, CAD, electrical and mechanical components, pneumatics, and motor control. Students will also take courses in technical writing, physics, chemistry, and business to round out their professional profile.

Total Program Credits: 63

General Education Requirements:			18 Credits
	ENGL 1010	Introduction to Academic Writing CC	3
or	ENGH 1005	Literacies and Composition Across Contexts CC (5)	
	HLTH 1100	Personal Health and Wellness TE	2
or	EXSC 1097	Fitness for Life TE (2)	
	Humanities (ENGL 2100 Recommended)		3
	Social Science (ECON 1010 Recommended)		3
	Physical Science (PHYS 1010 Recommended)		3
	MATH 1050	College Algebra QL	4
or	MATH 1055	College Algebra with Preliminaries QL (5)	
Discipline Core Requirements:			45 Credits
	EGDT 1071	3 Dimensional Modeling--Solidworks	3
	MECH 1010	Fundamentals of Mechatronics	3
	MECH 1200	Electronics in Automation Design	3
	MECH 1205	Electronics in Automation Design Laboratory	2
	MECH 1300	Industrial Wiring for Mechatronic Systems	1
	MECH 1305	Industrial Wiring for Mechatronic Systems Laboratory	2
	MECH 2200	Semiconductors Used in Mechatronic Systems	3
	MECH 2205	Semiconductors in Mechatronic Systems Lab	1
	MECH 2300	Microcontroller Architecture and Programming	4
	MECH 2305	Microcontroller Architecture and Programming Lab	1
	MECH 2400	Mechanical Components	4
	MECH 2500	Introduction to PLCs in Mechatronic Design	2
	MECH 2505	Introduction to PLCs in Mechatronic Design Laboratory	2
	MECH 2510	Fundamentals of Automation Controls	2
	MECH 2515	Fundamentals of Automation Controls Laboratory	1
	MECH 2550	Advanced PLC Programming and Applications	2
	MECH 2555	Advanced PLC Programming and Applications Laboratory	2
	MECH 2600	Introduction to Fluid Power Systems	2
	MECH 2605	Introduction to Fluid Power Systems Laborator	1
	MECH 2700	Industrial Motor Control Mechatronic Systems	2
	MECH 2705	Industrial Motor Control Mechatronic Systems Laboratory	2

Graduation Requirements:

1. Completion of 63 or more credit hours.
2. Overall grade point average of 2.0 (C) or above, with no core course below a C-.
3. Residency hours: minimum of 20 credit hours through course attendance at UVU.
4. Completion of GE and specified departmental requirements.

Mechatronics Engineering Technology, A.A.S.

Careers

1. Design a machine
2. Create logic to control the machine
3. Electrically actuate the machine

Related Careers

- Architectural and Engineering Managers
- Engineers, All Other
- Engineering Teachers, Postsecondary

Automation and Electrical Control Technology, Certificate of Proficiency

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Requirements

The Certificate of Proficiency in Automation and Electrical Control Technology provides training for students seeking to develop their skills and knowledge to troubleshoot, wire, repair, adapt, maintain, and control large automated electrical systems found in Industrial and Manufacturing Industries worldwide. This certificate is designed to provide high school students an opportunity to obtain a certificate in a Career and Technical Education field while still enrolled in high school, and stack into certificate and associate degrees at UVU.

Total Program Credits: 14

Discipline Core Requirements:			23 Credits
	ENGL 1010	Introduction to Academic Writing CC	3
	AET 1050	Electrical Math I	3
	AET 1060	Electrical Math II	3
	AET 1130	Introduction to Automation	1
	AET 1135	Introduction to Automation Lab	1
	AET 1140	Applied AC Theory	1
	AET 1145	Applied AC Lab	2
	AET 1150	Industrial Logic	1
	AET 1155	Industrial Logic Lab	1

Graduation Requirements:

1. Completion of a minimum of 17 credits.
2. Overall grade point average of 2.0 (C) or above, with no core course below a 'C-'.

3. Residency hours: minimum of 4 credit hours through course attendance at UVU.
4. Completion of GE and specified departmental requirements.

Automation and Electrical Control Technology, Certificate of Proficiency

Careers

1. Apply electrical theory to safely wire, troubleshoot, analyze, repair, and build electrical/electronic systems.
2. Utilize appropriate test equipment and hand tools to troubleshoot, analyze, repair electrical/electronic systems.
3. Describe the operation of electrical components, transformers, digital and relay logic in an electrical system.
4. Apply technical knowledge and skills to safely analyze, assemble, operate, troubleshoot digital systems.

Related Careers

- Electro-Mechanical Technicians

Electrical and Control Technology, Certificate of Proficiency

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Requirements

The Certificate of Proficiency in Electrical and Control Technology CA prepares technicians and technologists to troubleshoot, wire, repair, adapt, install, and maintain electrical and industrial motor control equipment found in many local industries. Knowledge and experience are gained through theory and engaging “hands on” labs that prepare graduates to work safely around industrial and commercial electrical equipment. Electrical DC and AC theory, transformers, circuits, wiring, motors, motor controls, relay logic, logic gates, and the National Electrical Code for commercial and industrial systems is emphasized. Skills are developed in troubleshooting, testing, and analyzing electrical circuits. This is the first employable step in the exciting career path of working with electrically automated equipment.

Total Program Credits: 23

Discipline Core Requirements:			23 Credits
	AET 1050	Electrical Math I	3
	AET 1060	Electrical Math II	3
	AET 1130	Introduction to Automation	1
	AET 1135	Introduction to Automation Lab	1
	AET 1140	Applied AC Theory	1
	AET 1145	Applied AC Lab	2
	AET 1150	Industrial Logic	1
	AET 1155	Industrial Logic Lab	1
	AET 1250	Industrial Electrical Code	2
	AET 1280	Electrical Motor Control	4
	AET 1285	Electrical Motor Control Lab	4

Graduation Requirements:

1. Completion of a minimum of 23 semester credits.
2. Overall grade point average of 2.0 (C) or above, with no core course below a 'C-'.
3. All courses must be completed at UVU.

Electrical and Control Technology, Certificate of Proficiency

Careers

1. Apply electrical theory to safely wire, troubleshoot, analyze, repair, and build electrical systems and control circuits.
2. Utilize appropriate test equipment and hand tools to troubleshoot, analyze, repair, and install electrical systems and control circuits.
3. Describe the operation of electrical components, motors, generators, transformers, and digital and relay logic in an electrical automation system.

Related Careers

- Electro-Mechanical Technicians

Mechatronics Engineering Technology, B.S.

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Requirements

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Total Program Credits: 121

Matriculation Requirements:			
1. Graduates of the Mechatronics Engineering Technology, Electrical Automation Robotic Technology (E.A.R.T) or Automation and ElectricalTechnology (A.E.T) A.A.S. degree programs at UVU may automatically matriculate into the Bachelor of Science degree program inMechatronics Engineering Technology. 2. E.A.R.T and A.E.T graduates that have not taken college algebra (MATH 1050) should enroll prior to or during their first semester in whichthey are enrolled in the Mechatronics B.S. program.			
General Education Requirements:			36 Credits
	ENGL 1010	Introduction to Academic Writing CC	3
or	ENGH 1005	Literacies and Composition Across Context CC (5.0)	
	ENGL 2010	Intermediate Academic Writing CC	3
	MATH 1050	College Algebra QL	4
or	MATH 1055	College Algebra with Preliminaries QL (5.0)	
	PHIL 205G	Ethics and Values IH GI	3
	HLTH 1100	Personal Health and Wellness TE (2.0)	
or	EXSC 1097	Fitness for Life TE	2
Complete one of the following:			3
	HIST 2700	US History to 1877 AS (3.0)	
and	HIST 2710	US History since 1877 AS (3.0)	
	HIST 1700	American Civilization AS (3.0)	

	HIST 1740	US Economic History AS (3.0) (recommended)	
	POLS 1000	American Heritage SS (3.0)	
	POLS 1100	American National Government AS (3.0)	
Distribution Courses:			
	Biology	BIOL 1010 Recommended	3
	Physical Science	PHYS 1010 Recommended	3
	Additional Biology or Physical Science		3
	Humanities	ENGL 2310 Recommended	3
	Social/Behavioral Science		3
	Fine Arts		3
Discipline Core Requirements:			79 Credits
	EGDT 1071	3 Dimensional Modeling--Solidworks	3
	MECH 1010	Fundamentals of Mechatronics	3
	MECH 1200	Electronics in Automation Design	3
	MECH 1205	Electronics in Automation Design Laboratory	2
	MECH 2200	Semiconductors in Mechatronic Systems	1
	MECH 1300	Industrial Wiring for Mechatronic Systems	1
	MECH 1305	Industrial Wiring for Mechatronic Systems Laboratory	2
	MECH 2205	Semiconductors in Mechatronic Systems Lab	1
	MECH 2300	Microcontroller Architecture and Programming	4
	MECH 2305	Microcontroller Architecture and Programming Lab	1
	MECH 2400	Mechanical Components	4
	MECH 2500	Introduction to PLCs in Mechatronic Design	2
	MECH 2505	Introduction to PLCs in Mechatronic Design Laboratory	2
	MECH 2510	Fundamentals of Automation Controls	2
	MECH 2515	Fundamentals of Automation Controls Laboratory	1
	MECH 2550	Advanced PLC Programming and Applications	2
	MECH 2555	Advanced PLC Programming and Applications Laboratory	2
	MECH 2600	Introduction to Fluid Power Systems	2
	MECH 2605	Introduction to Fluid Power Systems Laboratory	1
	MECH 2700	Industrial Motor Control Mechatronic Systems	2
	MECH 2705	Industrial Motor Control Mechatronic Systems Laboratory	2
	MECH 3220	Motion Control for Mechatronic Systems	3
	MECH 3225	Motion Control for Mechatronic Systems Laboratory	1
	MECH 3300	Industrial Networks	2
	MECH 3305	Industrial Networks Laboratory	1
	MECH 3400	Statics and Material Properties for Mechatronics	4
	MECH 3405	Statics and Material Properties for Mechatronics Laboratory	1
	MECH 3500	Industrial Robots	2
	MECH 3505	Industrial Robots Laboratory	1
	MECH 3570	Design Analysis and Rapid Prototyping WE	3
	MECH 3700	CNC Machines in Mechatronic Design	2
	MECH 3705	CNC Machines in Mechatronic Design Laboratory	1
	MECH 4300	Capstone I	2
	MECH 4305	Capstone I Laboratory	1
	MECH 4400	Polymers/Composites and Processes	3
	MECH 4500	Advanced Automation Controls	3
	MECH 4505	Advanced Automation Controls Laboratory	1
	MECH 4800	Capstone II WE	3
Elective Requirements:			6 Credits
	MECH 481R	Mechatronics Internship (3)	6
	MECH 490R	Topics in Mechatronics (3)	

Graduation Requirements:

1. Completion of 121 or more credit hours.
2. Overall grade point average of 2.0 (C) or above, with no core course below a C-.
3. Residency hours: minimum of 30 credit hours through course attendance at UVU.
4. Successful completion of at least one Global/Intercultural course.

Mechatronics Engineering Technology, B.S.

Careers

Program Learning Outcomes
1. Demonstrate proficiency in basic automation technology subjectsincluding: (a) electronic mathematics, (b) AC and DC circuits andcomponents, (c) computer architecture(d) programmable logic controllers(PLC's), (d) industrial pneumatic and hydraulic systems, and (e) CAD based mechanical design. 2. Demonstrate appropriate technical reading, writing, and communications skills. 3. Demonstrate proficiency in mathematics appropriate for automation technology. 4. Demonstrate proficiency in design, analysis, operation, and troubleshooting of automation systems, including: (a) automation motors (servo, stepper, PMDC, and BLDC), (b) industrial pneumatics (actuators,valvesetc.), (c) PID speed and position controls, and (d) kinematics/dynamics of machines (motion analysis, linkages, and mechanisms). 5. Master PLC programming, operation, and structure for automation systems.

Related Careers

- Architectural and Engineering Managers

- Engineers, All Other
- Engineering Teachers, Postsecondary