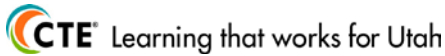


Utah Career and Technical Education Career Pathway

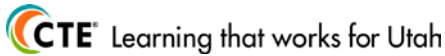
2018-2019 School Year



<p>CTSO Information Career and Technical Student Organizations (CTSO) align with the national Career Clusters® and the Utah CTE Career Pathways.</p> <p>TSA is the CTSO for students in the CAD Mechanical Design Career Pathway. TSA fosters personal growth, leadership, and opportunities in science, technology, engineering, and mathematics (STEM).</p> <p>Workforce Trends Industrial growth and increasingly complex designs will spur growth in drafting services. As technology advances, opportunities will be best for drafters with at least 2 years of postsecondary training, and computer-aided design systems experience.</p>	<h3>Career Cluster: Engineering & Technology</h3> <h3>Career Pathway: CAD Mechanical Design</h3> <table border="1" data-bbox="552 350 1564 688"> <thead> <tr> <th>CORE CODE</th> <th>FOUNDATION COURSES (required)</th> <th>CREDITS</th> <th></th> </tr> </thead> <tbody> <tr> <td>38.01.00.00.051</td> <td>CAD Mechanical Design 1 *</td> <td>.50</td> <td rowspan="3">1.50 credits</td> </tr> <tr> <td>38.01.00.00.052</td> <td>CAD Mechanical Design 2</td> <td>.50</td> </tr> <tr> <td>38.01.00.00.053</td> <td>CAD Mechanical Design 3</td> <td>.50</td> </tr> <tr> <td colspan="4" style="text-align: center;"><i>Or choose the following courses:</i></td> </tr> <tr> <td>38.01.00.00.300</td> <td>PLTW Introduction to Engineering Design</td> <td>1.00</td> <td></td> </tr> <tr> <th colspan="2">ELECTIVE COURSES</th> <th></th> <th></th> </tr> <tr> <td>38.03.00.00.010</td> <td>Engineering Technology</td> <td>.50</td> <td rowspan="4">1.00 credit</td> </tr> <tr> <td>40.13.00.00.030</td> <td>Industrial Design *</td> <td>1.00</td> </tr> <tr> <td>38.01.00.00.211</td> <td>Physics with Technology</td> <td>1.00</td> </tr> <tr> <td>41.00.00.00.030</td> <td>Workplace Skills</td> <td>.50</td> </tr> <tr> <td colspan="3"></td> <td style="text-align: center;">2.50 credits for completion</td> </tr> </tbody> </table> <p>* Course can be taken up to 1.00 credit. Foundation courses taken beyond the required credits can be used as elective credit.</p> <p style="text-align: center;">Career and Technical Education provides all students access to high-quality, rigorous career-focused programs that result in attainment of credentials with labor market value.</p>					CORE CODE	FOUNDATION COURSES (required)	CREDITS		38.01.00.00.051	CAD Mechanical Design 1 *	.50	1.50 credits	38.01.00.00.052	CAD Mechanical Design 2	.50	38.01.00.00.053	CAD Mechanical Design 3	.50	<i>Or choose the following courses:</i>				38.01.00.00.300	PLTW Introduction to Engineering Design	1.00		ELECTIVE COURSES				38.03.00.00.010	Engineering Technology	.50	1.00 credit	40.13.00.00.030	Industrial Design *	1.00	38.01.00.00.211	Physics with Technology	1.00	41.00.00.00.030	Workplace Skills	.50				2.50 credits for completion	<p>CAD Mechanical Design is: > High skill > High wage</p> <p>Sample Occupations Requiring: High School Diploma > N/A Certificate > N/A Assoc. or Technical Degree > Engineering Technician > Mechanical Drafter > Mechanical Engineering Technician Baccalaureate Degree > Aerospace Engineer > Career and Technical Education Teacher > Civil Engineer > Industrial Designer > Mechanical Engineer > Secondary Education Teacher Graduate or Prof. Degree > Mechanical Engineer</p>
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<p>Student Testimonial "My training, in CTE courses in high school, prepared me for life after high school by helping me discover my love of drafting. I discovered the need for drafters in the world of engineering. I focused my CTE Pathway toward this career goal, and have taken some advanced drafting classes to improve both my knowledge of the field and my employability in the field." Calvin Hill</p>	<h3>HIGH SCHOOL TO POSTSECONDARY EDUCATION AND TRAINING</h3> <p>There are a number of options for education and training beyond high school, depending on your career goals.</p> <table border="1" data-bbox="394 1040 1711 1149"> <tr> <td style="background-color: #00A0C0; color: white; text-align: center;">12th Grade</td> <td style="background-color: #FF8C00; color: white; text-align: center;">1-Year Certificate</td> <td style="background-color: #76C73A; color: white; text-align: center;">2-Year Associate or Technical Degree</td> <td style="background-color: #FFD700; color: black; text-align: center;">4-Year Bachelor's Degree</td> <td style="background-color: #808080; color: white; text-align: center;">More Graduate or Prof. Degree</td> </tr> </table> <div style="display: flex; justify-content: space-between;"> <div data-bbox="394 1154 940 1385" style="width: 45%;"> <p>Certificates are awarded upon the successful completion of a brief course of study, usually one year or less. Upon completion of a course of study, a certificate does not require any further action to retain.</p> <p>In high school a variety of certificates can be earned.</p> </div> <div data-bbox="940 1154 1711 1385" style="width: 45%;"> <p>An academic degree is an award for the completion of a program or course of study over multiple years at postsecondary education institutions.</p> <p>In 2015-2016, 73 percent of secondary students who concentrated in a CTE Career Pathway placed in postsecondary education, advanced training, military service or employment (October 1-December 31).</p> </div> </div>					12th Grade	1-Year Certificate	2-Year Associate or Technical Degree	4-Year Bachelor's Degree	More Graduate or Prof. Degree	<p>Utah Business and Industry Facts According to the Utah Department of Workforce Services, 620 mechanical drafters are employed by more than 3,000 businesses throughout the state. The annual median salary for an experienced mechanical drafter is \$51,690.</p>																																						
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<p>In 2016-2017, 105,691 CTE skill certificates were awarded to high school students. Students' knowledge and performance is demonstrated as part of the Skill Certificate process.</p>		<p>In 2016-2017, the graduation rate for students who concentrated in a CTE Career Pathway was 95 percent, compared to Utah's statewide graduation rate of 86 percent.</p>																																															

Utah Career and Technical Education Career Pathway

2018-2019 School Year



CTSO Information
 Career and Technical Student Organizations (CTSO) align with the national Career Clusters® and the Utah CTE Career Pathways.
 TSA is the CTSSO for students in the Electrical Engineering Career Pathway. TSA fosters personal growth, leadership, and opportunities in science, technology, engineering, and mathematics (STEM).

Workforce Trends
 Employment will be limited by computer-aided design and other technologies that increase productivity.
 Job opportunities will be best for those individuals who have an associate degree or extensive job training.

Career Cluster: Engineering & Technology

Career Pathway: Electrical Engineering

CORE CODE	FOUNDATION COURSES (required)	CREDITS
Foundation Component		
38.01.00.00.151	Engineering Principles 1	.50
38.01.00.00.021	Electronics 1 *	.50
38.01.00.00.022	Electronics 2	.50
38.01.00.00.023	Electronics 3	.50
<i>Or choose the following courses:</i>		
38.01.00.00.320	PLTW Digital Electronics	1.00
38.01.00.00.310	PLTW Principles of Engineering	1.00
Capstone Component		
38.01.00.00.990	Engineering Capstone	1.00
<i>Or choose the following course:</i>		
38.01.00.00.390	PLTW Engineering Design and Development	1.00
ELECTIVE COURSES		
38.03.00.00.010	Engineering Technology	.50
38.01.00.00.211	Physics with Technology	1.00
41.00.00.00.030	Workplace Skills	.50
3.00 credits for completion		

* Course can be taken up to 1.00 credit.
 Foundation courses taken beyond the required credits can be used as elective credit.

Career and Technical Education provides all students access to high-quality, rigorous career-focused programs that result in attainment of credentials with labor market value.

Electrical Engineering is:
 > High skill
 > High wage
 > High demand

Sample Occupations Requiring:
High School Diploma
 > Electronics Equipment Assembler
Certificate
 > Electronics Installer Repairer
Assoc. or Technical Degree
 > Electronics Drafter
 > Electronics Engineering Technician
Baccalaureate Degree
 > Career and Technical Education Teacher
 > Electrical Engineer
 > Electronics Engineer
Graduate or Prof. Degree
 > Electronics Engineer

Student Testimonial
 “Engineering, electronics, an architectural design, I found joy in these courses. These CTE Pathways have shown me many careers that provide [income] and most importantly joy and well-being.”
 Michael Contreras

HIGH SCHOOL TO POSTSECONDARY EDUCATION AND TRAINING

There are a number of options for education and training beyond high school, depending on your career goals.

12th Grade	1-Year Certificate	2-Year Associate or Technical Degree	4-Year Bachelor's Degree	More Graduate or Prof. Degree
Certificates are awarded upon the successful completion of a brief course of study, usually one year or less. Upon completion of a course of study, a certificate does not require any further action to retain. In high school a variety of certificates can be earned.		An academic degree is an award for the completion of a program or course of study over multiple years at postsecondary education institutions. In 2015-2016, 73 percent of secondary students who concentrated in a CTE Career Pathway placed in postsecondary education, advanced training, military service or employment (October 1-December 31).		

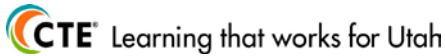
Utah Business and Industry Facts
 According to the Utah Department of Workforce Services, the median annual salary for an experienced electronics engineering technician is \$60,660.
 In Utah, more than 1,400 individuals are employed as electrical engineers.

CTE Skill Certificates
 Competency-based student assessments, measured by core standards and competencies needed to be successful in the workforce.
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Utah Career and Technical Education Career Pathway

2018-2019 School Year



CTSO Information
 Career and Technical Student Organizations (CTSO) align with the national Career Clusters® and the Utah CTE Career Pathways.

TSA is the CTSO for students in the Mechanical Engineering Career Pathway. TSA fosters personal growth, leadership, and opportunities in science, technology, engineering, and mathematics (STEM).

Workforce Trends
 Due to the expansion of jobs in the technical fields and the increasing number of engineers who are retiring, the number of job openings in technology and engineering are increasing.

According to the U.S. Bureau of Labor Statistics, 13 percent of U.S. engineering jobs are held by women, with one in four jobs in technology, engineering, and mathematics.

Career Cluster: Engineering & Technology

Career Pathway: Mechanical Engineering

CORE CODE	FOUNDATION COURSES (required)	CREDITS	
CAD Component			
38.01.00.00.051	CAD Mechanical Design 1 *	.50	1.00 credit
38.01.00.00.052	CAD Mechanical Design 2	.50	
<i>Or choose the following course:</i>			
38.01.00.00.300	PLTW Introduction to Engineering Design	1.00	
Foundation Component			
38.01.00.00.151	Engineering Principles 1	.50	1.00 credit
38.01.00.00.152	Engineering Principles 2	.50	
<i>Or choose the following course:</i>			
38.01.00.00.310	PLTW Principles of Engineering	1.00	
Capstone Component			
38.01.00.00.990	Engineering Capstone	1.00	1.00 credit
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Mechanical Engineering is:
 > High skill
 > High wage

Sample Occupations Requiring:
High School Diploma
 > N/A

Certificate
 > N/A

Assoc. or Technical Degree
 > Civil Engineer Technician
 > Engineering Technician
 > Industrial Engineering Technician
 > Mechanical Engineering Technician

Baccalaureate Degree
 > Aerospace Engineer
 > Biomedical Engineer
 > Career and Technical Education Teacher
 > Civil Engineer
 > Electrical Engineer
 > Industrial Engineer
 > Mechanical Engineer

Graduate or Prof. Degree
 > Civil Engineer

Student Testimonial
 "I have always liked doing hands-on projects and thinking of different ways to make something better. With the CTE classes I was able to see whole processes, from the design stage on paper to transferring that design and idea into a computer application, then all the way to building a prototype."
 Hunter Okerlund

HIGH SCHOOL TO POSTSECONDARY EDUCATION AND TRAINING

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Utah Business and Industry Facts

The Engineering Initiative, established by the Utah State Legislature in 2001, aimed to triple engineering and computer science graduates. Since 2015, Utah state schools graduated 907 engineering and computer science students per year, 657 more than promised.

According to Richard Brown, Dean of Engineering at the University of Utah, Utah's gross domestic product has more than doubled since the Engineering Initiative started.

CTE Skill Certificates
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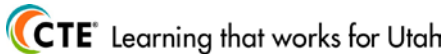
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Utah Career and Technical Education Career Pathway

2018-2019 School Year



CTSO Information
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 TSA is the CTSSO for students in the Robotics and Electronics Career Pathway. TSA fosters personal growth, leadership, and opportunities in science, technology, engineering, and mathematics (STEM).

Workforce Trends
 Most robotics engineers are employed by private companies and work in laboratory or production settings.

Career Cluster: Engineering & Technology

Career Pathway: Robotics & Electronics

CORE CODE	FOUNDATION COURSES (required)	CREDITS	
38.01.00.00.031	Robotics 1	.50	1.00 credit
38.01.00.00.032	Robotics 2	.50	
ELECTIVE COURSES			
35.02.00.00.030	Computer Programming 1	1.00	1.00 credit
38.01.00.00.021	Electronics 1 *	.50	
38.01.00.00.010	Engineering Technology	.50	
40.09.00.00.070	Industrial Maintenance Technician	1.00	
38.01.00.00.211	Physics with Technology	.50	
41.00.00.00.030	Workplace Skills	.50	
2.00 credits for completion			

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Robotics & Electronics is:
 > High skill
 > High wage

Sample Occupations Requiring:
High School Diploma
 > N/A
Certificate
 > N/A
Assoc. or Technical Degree
 > Electro-Mechanical Technicians
Baccalaureate Degree
 > Automation Engineer
 > Career and Technical Education Teacher
 > Engineer
 > Industrial Engineer
 > Robotics Engineer
Graduate or Prof. Degree
 > Engineer

Student Testimonial
 "I want to earn an AAS degree in mechatronics. After completing my degree I plan on finding work with a company designing production equipment. My high school engineering instructor was an amazing person and has influenced my love of this field and the path that I have chosen."
 Connor Hendry

HIGH SCHOOL TO POSTSECONDARY EDUCATION AND TRAINING

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Utah Business and Industry Facts
 From "smart" shoes to flying robots to self-driving cars, throughout Utah there are hundreds of companies that use robotics to streamline the manufacturing process, produce goods, and make daily tasks easier.
 "We have this idea that robots will help us in the future," said Mark Minor, associate professor, University of Utah. "Well, the future is here. You just have to understand what they're doing."
 (Deseret News, March 9, 2015)

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