Mechatronics Technician

Cluster Overview: Planning, managing, and providing scientific research and professional and technical services including laboratory and testing services, and research and development services.

Career Goal (O*NET Code): (51-4041) - Machinists and tools and die makers set up and operate a variety of computer-controlled or mechanically-controlled machine tools to produce precision metal parts, instruments, and tools.

Student Name:_____
Grade: _____
School: _____

SUGGESTED COURSEWORK

Middle School	8th	***HS Courses:***	(Local districts may list high school credit courses here)		
High School	9th	***Courses*:***	English I Algebra I or Geometry Biology	World Geography Foreign Language I Physical Education or Athletics	Fine Arts
		Career-Related Electives:	Concepts of Engineering & Technology		
	10th	***Courses:***	English II Geometry or Algebra II Chemistry	World History Foreign Language II Elective	Elective
		Career-Related Electives:	Engineering Design & Presentation		
	11th	***Core Courses:***	English III Algebra II or Pre-Calculus Physics	United States History Foreign Language III ** Professional Communications or Speech	Elective
		Career-Related Electives:	Advanced Engineering Design & Presentation		
	12th	***Core Courses:***	English IV Pre-Calculus or Calculus 4th Science	Government/Economics Elective Elective	
		Career-Related Electives:	Practicum in STEM		

How to Become an Electro-Mechanical Technician
Electro-mechanical technicians typically need either an associate's degree or a postsecondary certificate. Earning an associate's degree in electronic engineering technology eases entry into a bachelor's degree program.

Postsecondary	**Texas Southmost College**	**South Texas College**	**Texas State Technical College**
		Mechatronics Technology Specialist (CERT)	Mechatronics Technology (AAS)
	The University of Texas at Brownsville	**The University of Texas - Pan American**	
	Engineering Technology (BS)		

EXTENDED LEARNING EXPERIENCES

Curricular Experiences*:*
BEST Robotics, Inc.
FIRST Robotics Competition
Project Lead the Way
Skills USA
Technology Student Association
The Infinity Project

Career Learning Experiences:
Career Preparation
Job Shadowing
Internship

Extracurricular Experiences:
Destination ImagiNation
International Bridge Building Contest
Marine Advanced Technology Education Center
National Engineering Design Competition
UIL Academic Competitions
VEX Robotics Competition

Service Learning Experiences:
Campus Service Organizations
Community Service Volunteer
Peer Mentoring/Peer Tutoring

COLLEGE CREDIT OPPORTUNITIES -- High School

Students should take Advanced Placement (AP), International Baccalaureate (IB), dual credit, Advanced Technical Credit (ATC), or locally articulated courses (Tech Prep), if possible. List those courses that count for college credit on your campus.

Carrer Options
(Sample of reported job titles)

- Electro-Mechanical Technicians (E/M Technician)
- Electronic Technician
- Test Technician
- Tester
- Laboratory Technician
- Mechanic Technician
- Product Test Specialist
- Electro-Mechanic
- Electronic Instrument Technician
- Maintenance Technician

Professional Associations:
- American Society for Engineering Education
- IEEE
- Technology Student Association
- ABET

*** Students must meet local & state high school graduation requirements. ** Required course for the Distinguished Graduation Plan (in addition to other measures). *** Based on campus availability. Students may select other elective courses for personal enrichment purposes.**

This plan of study serves as a guide, along with other career planning materials, for pursuing a career path and is based on the most recent information as of 2009. All plans meet high school graduation requirements as well as college entrance requirements.

Mechatronics Technician

TEA Industry Cluster	STEM
SOC Code	-
Identified by	TIP Strategies; TWC LMCI; Tech Prep Occupations
Projected Growth (2018)	0 %
BISD Magnet School Available	Yes

Source: Demand Occupations by Cluster, updated *June 27, 2012*

Description

What Electro-Mechanical Technicians Do

Electro-mechanical technicians combine knowledge of mechanical technology with knowledge of electrical and electronic circuits. They install, troubleshoot, repair, and upgrade electronic and computer-controlled mechanical systems, such as robotic assembly machines.

Duties

Electro-mechanical technicians typically do the following:

- Read blueprints, schematics, and diagrams to determine the method and sequence of assembly of a part, machine, or piece of equipment
- Verify dimensions of parts, using precision measuring instruments, to ensure that specifications are met
- Operate metalworking machines to make housings, fittings, and fixtures
- Repair and calibrate hydraulic and pneumatic assemblies
- Test the performance of electro-mechanical assemblies, using test instruments
- Install electronic parts and hardware, using soldering equipment and hand tools

Electro-mechanical technicians sometimes test and operate machines in factories and other worksites. They also analyze and record test results, and prepare written documentation to describe the tests they did and what the test results were.

Job prospects are likely to be best for electro-mechanical technicians who train in a field known as mechatronics, which provides an understanding of four key systems:

- Mechanical systems
- Electronic systems
- Control systems
- Computer systems

Mechatronics training has two advantages for electro-mechanical technicians. First, it is multidisciplinary, which gives technicians more versatile training that is applicable across a broad range of fields. Second, it allows a technician to contribute to a product in its entirety, from concept and design to delivery.

Training Opportunities Linked to Those Jobs
(Degree Types and Colleges/Universities)

How to Become an Electro-Mechanical Technician
Electro-mechanical technicians typically need either an associate's degree or a postsecondary certificate.

Education
Associate's degree programs for electro-mechanical technicians usually take 2 years and are offered at vocational–technical schools and community colleges. Vocational–technical schools include postsecondary public institutions that serve local students and emphasize training needed by local employers. Community colleges offer programs similar to those in technical institutes but may include more theory-based and liberal arts coursework.

Most associate's degree programs that are accredited by ABET (formerly the Accreditation Board for Engineering and Technology) include at least college algebra and trigonometry as well as basic science courses. ABET-accredited programs offer training in engineering technology specialties.
In community college programs, prospective electro-mechanical technicians can concentrate in fields such as the following:

- Electro-mechanics
- Industrial maintenance
- Computer-integrated manufacturing

There are also bachelor's degree programs in electrical engineering technology and mechanical engineering technology, although most technicians earn an associate's degree. Graduates of bachelor's degree programs work as electrical engineering technologists and mechanical engineering technologists, rather than as technicians. Earning an associate's degree in electronic engineering technology eases entry into a bachelor's degree program.

Important Qualities

***Detail oriented*.** Electro-mechanical technicians must make and keep the precise, accurate measurements that mechanical engineers need.
Information ordering skills. To carry out engineers' designs, inspect designs for quality control, and assemble prototypes, technicians must be able to read instructions and to follow a logical sequence or a specific set of rules.
Interpersonal skills. Electro-mechanical technicians must be able to take instruction and offer advice when needed. In addition, they often need to coordinate their work with that of others.
Manual dexterity. Electro-mechanical engineering technicians in particular must be able to use handtools and soldering irons on small circuitry and electronic parts to create detailed electronic components by hand.
Math skills. Electro-mechanical engineering technicians use mathematics for analysis, design, and troubleshooting in their work.
Mechanical skills. Electro-mechanical technicians must be able to apply the theory and instructions of engineers by creating or building new components for industrial machinery or equipment. They must be adept at operating machinery, including drill presses, grinders, and engine lathes.
Writing skills. These technicians must write reports on onsite construction, the results of testing, or problems they find when carrying out designs. Their writing must be clear and well organized so that the engineers they work with can understand the reports.

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Local Employers

A & H Enterprises	Brownsville		Industrial Projects Devmnt CO	Brownsville
Alamo Iron Works	Brownsville		Kemet Electronics Corp	Brownsville
Boeing CO	Harlingen		Materiales Triple AAA Inc	Brownsville
Electric Fixture Supply Inc	Brownsville		Security International Inc	Harlingen
Hydraulic & Diesel Parts	Brownsville		Valley Rio Enterprises Inc	Brownsville

Career Options

(Specific Job Types)

- Electro-Mechanical Technicians (E/M Technician)
- Electronic Technician
- Test Technician
- Tester
- Mechanic Technician
- Product Test Specialist
- Electro-Mechanic
- Electronic Instrument Technician
- Laboratory Technician
- Maintenance Technician

Salary Ranges

Wages for **Electro-Mechanical Technicians**

Location	Pay Period	2011				
		10%	25%	Median	75%	90%
United States	Hourly	$15.91	$19.74	$24.63	$30.40	$36.24
	Yearly	$33,100	$41,100	$51,200	$63,200	$75,400
Texas	Hourly	$16.07	$18.83	$22.52	$28.71	$35.75
	Yearly	$33,400	$39,200	$46,800	$59,700	$74,400

Professional Associations linked to the Careers

For information about general engineering education and career resources, visit

American Society for Engineering Education

IEEE

Technology Student Association

For information on accredited programs, visit

ABET

Sources

The information provided in this document was collected from the following sources:

- Occupational Outlook Handbook (http://www.bls.gov/ooh/)
- O*NET OnLine (http://www.onetonline.org/)
- Texas CARES (http://www.texascaresonline.com/)
- CareerOneStop (http://www.careeronestop.org/)