



# TORQ Analysis of Mechanical Engineering Technicians to Electronic Drafters

ANALYSIS INPUT					
Transfer	Title	O* NET	Filters		
From Title:	Mechanical Engineering Technicians	17-3027.00	Abilities:	Importance Level: 50	Weight: 1
To Title:	Electronic Drafters	17-3012.01	Skills:	Importance Level: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

TORQ RESULTS											
Grand TORQ:					91						
Ability TORQ		Skills TORQ		Knowledge TORQ							
Level	96	Level	86	Level	91						
Gaps To Narrow if Possible		Upgrade These Skills		Knowledge to Add							
Ability	Level	Gap	Impt	Skill	Level	Gap	Impt	Knowledge	Level	Gap	Impt
No Critical Gaps Recorded!				Operations Analysis	66	11	70	No Knowledge Upgrades Required!			
				Active Listening	68	5	77				
<p>LEVEL and IMPT (IMPORTANCE) refer to the Target Electronic Drafters. GAP refers to level difference between Mechanical Engineering Technicians and Electronic Drafters.</p>											

ASK ANALYSIS			
Ability Level Comparison - Abilities with importance scores over 50			
Description	Mechanical Engineering Technicians	Electronic Drafters	Importance
Near Vision	64	53	68
Oral Comprehension	69	62	65
Written Comprehension	71	59	65
Oral Expression	69	60	65
Written Expression	62	51	65
Deductive Reasoning	71	51	59
Inductive Reasoning	66	51	59
Information Ordering	67	48	59
Visualization	64	50	59
Speech Clarity	44	39	59
Speech Recognition	42	39	53
Problem Sensitivity	66	50	50



Category Flexibility	59		42		50	
Selective Attention	44		42		50	
Finger Dexterity	53		39		50	

Skill Level Comparison - Abilities with importance scores over 69

Description	Mechanical Engineering Technicians	Electronic Drafters	Importance
Active Listening	63	68	77
Operations Analysis	55	66	70

Knowledge Level Comparison - Knowledge with importance scores over 69

Description	Mechanical Engineering Technicians	Electronic Drafters	Importance
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### Experience & Education Comparison

Related Work Experience Comparison			Required Education Level Comparison		
Description	Mechanical Engineering Technicians	Electronic Drafters	Description	Mechanical Engineering Technicians	Electronic Drafters
10+ years	10%	20%	Doctoral	0%	0%
8-10 years	1%	0%	Professional Degree	0%	0%
6-8 years	7%	17%	Post-Masters Cert	0%	0%
4-6 years	2%	0%	Master's Degree	0%	2%
2-4 years	39%	16%	Post-Bachelor Cert	0%	0%
1-2 years	10%	9%	Bachelors	43%	22%
6-12 months	0%	20%	AA or Equiv	23%	36%
3-6 months	4%	0%	Some College	0%	2%
1-3 months	11%	1%	Post-Secondary Certificate	14%	21%
0-1 month	0%	0%	High School Diploma or GED	16%	14%
None	11%	14%	No HSD or GED	0%	0%

Mechanical Engineering Technicians

Electronic Drafters

Most Common Educational/Training Requirement:

Associate degree

Postsecondary vocational award

Job Zone Comparison

3 - Job Zone Three: Medium Preparation Needed

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Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.

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### Tasks



## Mechanical Engineering Technicians

## Core Tasks

## Generalized Work Activities:

- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
- Evaluating Information to Determine Compliance with Standards - Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.

## Specific Tasks

## Occupation Specific Tasks:

- Analyze test results in relation to design or rated specifications and test objectives, and modify or adjust equipment to meet specifications.
- Calculate required capacities for equipment of proposed system to obtain specified performance and submit data to engineering personnel for approval.
- Confer with technicians and submit reports of test results to engineering department and recommend design or material changes.
- Devise, fabricate, and assemble new or modified mechanical components for products such as industrial machinery or equipment, and measuring instruments.
- Discuss changes in design, method of manufacture and assembly, and drafting techniques and procedures with staff and coordinate corrections.
- Draft detail drawing or sketch for drafting room completion or to request parts fabrication by machine, sheet or wood shops.
- Estimate cost factors including labor and material for purchased and fabricated parts and costs for assembly, testing, or installing.
- Evaluate tool drawing designs by measuring drawing dimensions and comparing with original specifications for form and function using engineering skills.
- Inspect lines and figures for clarity and return erroneous drawings to designer for

## Electronic Drafters

## Core Tasks

## Generalized Work Activities:

- Drafting, Laying Out, and Specifying Technical Devices, Parts, and Equipment - Providing documentation, detailed instructions, drawings, or specifications to tell others about how devices, parts, equipment, or structures are to be fabricated, constructed, assembled, modified, maintained, or used.
- Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
- Evaluating Information to Determine Compliance with Standards - Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Updating and Using Relevant Knowledge - Keeping up-to-date technically and applying new knowledge to your job.

## Specific Tasks

## Occupation Specific Tasks:

- Assemble documentation packages and produce drawing sets which are then checked by an engineer or an architect.
- Confer with engineering staff and other personnel to resolve problems.
- Determine the order of work and the method of presentation, such as orthographic or isometric drawing.
- Draft working drawings, wiring diagrams, wiring connection specifications or cross-sections of underground cables, as required for instructions to installation crew.
- Draw master sketches to scale showing relation of proposed installations to existing facilities and exact specifications and dimensions.
- Explain drawings to production or construction teams and provide adjustments as necessary.
- Measure factors that affect installation and arrangement of equipment, such as distances to be spanned by wire and cable.
- Prepare and interpret specifications, calculating weights, volumes, and stress factors.
- Reproduce working drawings on copy machines or trace drawings in ink.
- Review completed construction drawings and cost estimates for accuracy and



correction.

- Operate drill press, grinders, engine lathe, or other machines to modify parts tested or to fabricate experimental parts for testing.
- Prepare parts sketches and write work orders and purchase requests to be furnished by outside contractors.
- Read dials and meters to determine amperage, voltage, electrical output and input at specific operating temperature to analyze parts performance.
- Record test procedures and results, numerical and graphical data, and recommendations for changes in product or test methods.
- Review project instructions and blueprints to ascertain test specifications, procedures, and objectives, and test nature of technical problems such as redesign.
- Review project instructions and specifications to identify, modify and plan requirements fabrication, assembly and testing.
- Set up and conduct tests of complete units and components under operational conditions to investigate proposals for improving equipment performance.
- Set up prototype and test apparatus and operate test controlling equipment to observe and record prototype test results.
- Test equipment, using test devices attached to generator, voltage regulator, or other electrical parts, such as generators or spark plugs.

#### Detailed Tasks

##### Detailed Work Activities:

- analyze engineering design problems
- analyze engineering test data
- analyze technical data, designs, or preliminary specifications
- calculate engineering specifications
- communicate technical information
- conduct performance testing
- confer with engineering, technical or manufacturing personnel
- develop plans for programs or projects
- diagnose mechanical problems in machinery or equipment
- draw prototypes, plans, or maps to scale
- estimate cost for engineering projects
- evaluate engineering data
- examine engineering documents for completeness or accuracy
- fill out purchase requisitions
- follow manufacturing methods or techniques
- follow statistical process control procedures
- inspect facilities or equipment for regulatory compliance

and cost estimates for accuracy and conformity to standards and regulations.

- Study work order requests to determine type of service, such as lighting or power, demanded by installation.
- Supervise and train other technologists, technicians and drafters.
- Use computer-aided drafting equipment and/or conventional drafting stations, technical handbooks, tables, calculators, and traditional drafting tools such as boards, pencils, protractors, and T-squares.
- Visit proposed installation sites and draw rough sketches of location.
- Write technical reports and draw charts that display statistics and data.

#### Detailed Tasks

##### Detailed Work Activities:

- analyze technical data, designs, or preliminary specifications
- communicate technical information
- compute cost estimates of construction or engineering projects
- conduct training for personnel
- confer with engineering, technical or manufacturing personnel
- create mathematical or statistical diagrams or charts
- direct and coordinate activities of workers or staff
- draw prototypes, plans, or maps to scale
- estimate time needed for project
- examine engineering documents for completeness or accuracy
- inspect manufactured products or materials
- prepare technical reports or related documentation
- read blueprints
- read schematics
- read specifications
- read technical drawings
- understand engineering data or reports
- understand technical operating, service or repair manuals
- use computer aided drafting or design software for design, drafting, modeling, or other engineering tasks
- use drafting or mechanical drawing techniques

#### Technology - Examples

##### Computer aided design CAD software

- Autodesk AutoCAD software
- Dassault Systemes CATIA software
- Pro-E CAD software



- modify electrical or electronic equipment or products
- operate metal or plastic fabricating equipment/machinery
- operate pneumatic test equipment
- operate precision test equipment
- prepare technical reports or related documentation
- read blueprints
- read schematics
- read technical drawings
- read vehicle manufacturer's specifications
- recommend solutions to engineering problems
- record test results, test procedures, or inspection data
- set up and operate variety of machine tools
- test equipment as part of engineering projects or processes
- understand engineering data or reports
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use drafting or mechanical drawing techniques
- use electrical or electronic test devices or equipment
- use knowledge of metric system
- use precision measuring tools or equipment
- use robotics systems technology
- use scientific research methodology
- use technical information in manufacturing or industrial activities
- use technical regulations for engineering problems

Technology - Examples

Analytical or scientific software

- ANSYS Mechanical
- MSC Software Adams
- Spectral Dynamics STARAcoustics
- Spectral Dynamics STARModal
- The Mathworks MATLAB
- Wolfram Research Mathematica

Computer aided design CAD software

- Autodesk AutoCAD Mechanical
- Autodesk Inventor
- Bentley MicroStation
- Computer aided design CAD software

- PTC Pro/ENGINEER software

- SofTech CADRA

- UGS Solid Edge

Computer aided manufacturing CAM software

- 1CadCam Unigraphics

Data base user interface and query software

- Design specification database software

- Microsoft Access

Electronic mail software

- IBM Lotus Notes

Enterprise resource planning ERP software

- Bowen & Groves M1 ERP
- Enterprise resource planning ERP software
- Epicor Vantage
- Exact Software Macola ERP
- Made2Manage Systems M2MERP
- Manufacturing resources planning MRP software
- Sage Accpac ERP
- SoftBrands Fourth Shift Edition

Office suite software

- Microsoft Office

Project management software

- JD Edwards EnterpriseOne Project Management
- PTC Pro/INTRALINK

Spreadsheet software

- Microsoft Excel

Tools - Examples

- Desktop computers
- Drafting machines
- Personal computers



- IBM CATIA V5

- PTC Pro/ENGINEER software

- SolidWorks CAD software

#### Computer aided manufacturing CAM software

- CNC Mastercam

- Computer aided manufacturing CAM software

- Three-dimensional 3D solid modeling software

#### Development environment software

- Microsoft Visual Basic

- National Instruments LabVIEW

#### Industrial control software

- Computerized numerical control CNC programming software

- Robotic control software

- Soft Servo Systems LadderWorks PLC

#### Internet browser software

- Web browser software

#### Office suite software

- Microsoft Office

#### Presentation software

- Microsoft PowerPoint

#### Project management software

- Microsoft Project

#### Spreadsheet software

- Microsoft Excel

#### Word processing software

- Corel WordPerfect software

- Microsoft Word

#### Tools - Examples

- Accelerometers

- Adjustable wrenches

- Air compressors

- Clamp-on ammeters

- High-voltage amplifiers

- Anemometers

- Optical microscopes



- C clamps
- Dial calipers
- Electronic comparators
- Compression testing machines
- Coordinate measuring machines CMM
- Dynamometers
- Extrusion machines
- Fatigue testers
- Mill files
- Fluid meters
- Rotameters
- Force sensors
- Plane-parallel gauge blocks
- Arc welding equipment
- Bore gauges
- Go/no-go gauges
- Safety goggles
- Digitizing tablets
- Surface grinders
- Polishing machines
- Claw hammers
- Durometers
- Vernier height gauges
- Hex keys
- Impact testers
- Heat treatment furnaces
- Injection molders
- Metallographs
- Computerized numerical control CNC lathes
- Spirit levels
- Granite surface plates
- Load cells



- Locking pliers
- Long nose pliers
- Metal inert gas MIG welding equipment
- Marking gauges
- Bend test fixtures
- Programmable logic controllers PLC
- Micrometers
- Microprocessors
- Combination milling machines
- Milling machines
- Digital multimeters
- Laptop computers
- Nut drivers
- Oscilloscopes
- Personal computers
- Drafting plotters
- Positioning jigs
- Power drills
- Cylindrical grinders
- Belt sanders
- Band saws
- Pressure sensors
- Safety gloves
- Protractors
- Center punches
- Hacksaws
- Offset screwdrivers
- Scribes
- Shear testing fixtures
- Power shears
- Signal conditioners
- Signal generators



- Arc-joint pliers
- Socket sets
- Soldering equipment
- Combination squares
- Steel rules
- Strain gauges
- Wire strippers
- Measuring tapes
- Dies
- Temperature sensors
- Tensile testers
- Dynamic mechanical analyzers DMA
- Snap gauges
- Screw thread gauges
- Tungsten inert gas TIG welding equipment
- Twin-screw extruders
- Twist drills
- Ultrasound inspection equipment
- Utility knives
- Vacuum molders
- Freon recovery equipment
- Vibration testers
- Spot welders
- Welding masks
- Dry rod ovens
- Wire cutters
- Drill presses

### Labor Market Comparison

Maine Department of Labor.

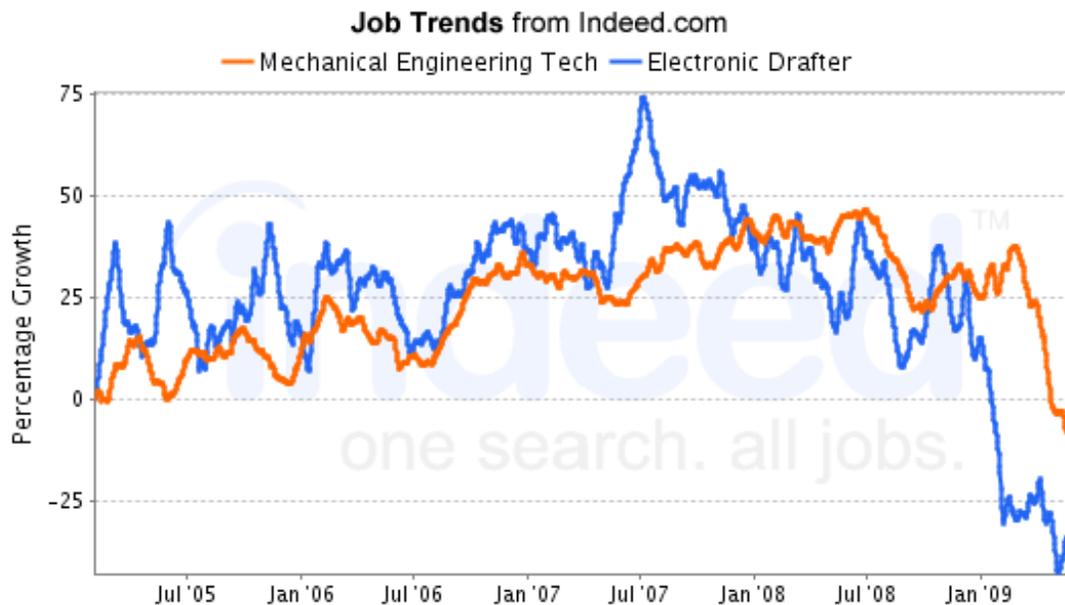
Description	Mechanical Engineering Technicians	Electronic Drafters	Difference
Median Wage	\$ 44,890	\$ 44,860	\$ ( 30)
10th Percentile Wage	\$ 30,530	\$ 34,650	\$ 4,120



25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 51,860	\$ 52,200	\$ 340
90th Percentile Wage	\$ 61,330	\$ 60,240	\$(1,090)
Mean Wage	\$ 45,460	\$ 46,680	\$ 1,220
Total Employment - 2105	130	90	-40
Employment Base - 2006	129	90	-39
Projected Employment - 2114	132	76	-56
Projected Job Growth - 2006-2114	2.3 %	-15.5 %	-17.9 %
Projected Annual Openings - 2006-2114	3	3	0
Special			
Special Occupations:			

### National Job Posting Trends

Trend for Mechanical Engineering Technicians and Electronic Drafters



Data from [Indeed](http://Indeed.com)

### Programs

Related Programs

Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD

Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD. A program that prepares individuals to apply technical knowledge and skills to develop working schematics and representations in support of electrical/electronic engineers, computer engineers, and related professionals. Includes instruction in basic electronics, electrical systems and computer layouts; electrode-mechanical drafting; manufacturing circuitry; computer-aided drafting (CAD); and electrical systems specification interpretation.



No information on schools for the program

**Maine Statewide Promotion Opportunities for Mechanical Engineering Technicians**

O*NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings	Special
17-3027.00	Mechanical Engineering Technicians	100	3	130	\$44,890.00	\$0.00	2%	3	
17-3023.03	Electrical Engineering Technicians	91	3	430	\$45,180.00	\$290.00	-20%	9	
27-1021.00	Commercial and Industrial Designers	91	4	140	\$49,170.00	\$4,280.00	5%	5	
17-3013.00	Mechanical Drafters	89	3	710	\$46,630.00	\$1,740.00	2%	22	
17-2141.00	Mechanical Engineers	89	4	620	\$67,210.00	\$22,320.00	-9%	14	
17-2072.00	Electronics Engineers, Except Computer	88	4	210	\$76,420.00	\$31,530.00	-26%	4	
17-2112.00	Industrial Engineers	87	4	580	\$68,350.00	\$23,460.00	11%	22	
17-2131.00	Materials Engineers	87	4	40	\$70,250.00	\$25,360.00	-7%	1	
17-3026.00	Industrial Engineering Technicians	86	3	370	\$51,700.00	\$6,810.00	6%	9	★
17-2121.02	Marine Architects	86	4	60	\$75,520.00	\$30,630.00	-9%	1	
51-4111.00	Tool and Die Makers	86	3	160	\$51,670.00	\$6,780.00	-11%	2	
17-2111.03	Product Safety Engineers	85	5	90	\$49,940.00	\$5,050.00	3%	3	
17-2031.00	Biomedical Engineers	84	4	20	\$86,560.00	\$41,670.00	-10%	1	
17-2071.00	Electrical Engineers	84	4	260	\$73,050.00	\$28,160.00	-10%	6	
17-2121.01	Marine Engineers	84	4	60	\$75,520.00	\$30,630.00	-9%	1	

Special Occupations:

**Top Industries for Electronic Drafters**



Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Electrical contractors	238210	9.90%	3,450	3,618	4.86%
Semiconductor and other electronic component manufacturing	334400	6.95%	2,421	2,116	-12.59%
Electric power generation, transmission and distribution	221100	6.73%	2,346	2,157	-8.03%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	5.70%	1,987	1,902	-4.26%
Plumbing, heating, and air-conditioning contractors	238220	5.36%	1,866	2,107	12.93%
Self-employed workers, primary job	000601	4.97%	1,730	1,843	6.54%
Electrical equipment manufacturing	335300	4.78%	1,665	1,415	-15.03%
Wired telecommunications carriers	517100	3.44%	1,198	940	-21.49%
Communications equipment manufacturing	334200	2.85%	994	1,002	0.79%
Other electrical equipment and component manufacturing	335900	1.75%	610	565	-7.34%
Employment services	561300	1.43%	497	629	26.56%
Computer and peripheral equipment manufacturing	334100	1.31%	457	299	-34.54%
Other building equipment contractors	238290	1.14%	397	430	8.38%
Security systems services	561620	1.06%	370	496	34.30%
Management of companies and enterprises	551100	1.03%	358	412	15.28%

### Top Industries for Mechanical Engineering Technicians

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Research and development in the physical, engineering, and life sciences	541710	8.52%	4,072	4,344	6.69%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	6.30%	3,013	2,884	-4.26%
Testing laboratories	541380	5.16%	2,467	3,037	23.12%
Other general purpose machinery manufacturing	333900	5.01%	2,393	2,376	-0.70%
Semiconductor and other electronic component manufacturing	334400	3.33%	1,593	1,392	-12.59%
Aerospace product and parts manufacturing	336400	3.02%	1,442	1,468	1.84%
Agriculture, construction, and mining machinery manufacturing	333100	2.58%	1,234	1,152	-6.63%
Employment services	561300	2.19%	1,047	1,325	26.56%
Industrial machinery manufacturing	333200	2.14%	1,022	921	-9.88%
Engine, turbine, and power transmission equipment manufacturing	333600	2.05%	980	822	-16.07%



Motor vehicle parts manufacturing	336300	2.00%	957	762	-20.39%
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	333400	1.94%	926	852	-8.01%
Medical equipment and supplies manufacturing	339100	1.78%	851	870	2.29%
Communications equipment manufacturing	334200	1.74%	833	839	0.79%
Commercial and service industry machinery manufacturing	333300	1.63%	780	684	-12.28%



# TORO Analysis of Mechanical Engineering Technicians to Electrical Engineering Technicians

ANALYSIS INPUT					
Transfer	Title	O*NET	Filters		
From Title:	Mechanical Engineering Technicians	17-3027.00	Abilities:	Importance Level: 50	Weight: 1
To Title:	Electrical Engineering Technicians	17-3023.03	Skills:	Importance Level: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

TORQ RESULTS											
Grand TORQ:					91						
Ability TORQ		Skills TORQ		Knowledge TORQ							
Level	96	Level	84	Level	92						
Gaps To Narrow if Possible			Upgrade These Skills		Knowledge to Add						
Ability	Level	Gap	Impt	Skill	Level	Gap	Impt	Knowledge	Level	Gap	Impt
No Critical Gaps Recorded!				Critical Thinking	67	13	73	Computers and Electronics	73	15	83
				Science	56	11	71	Engineering and Technology	77	4	79
				Troubleshooting	67	4	79				

LEVEL and IMPT (IMPORTANCE) refer to the Target Electrical Engineering Technicians. GAP refers to level difference between Mechanical Engineering Technicians and Electrical Engineering Technicians.

ASK ANALYSIS			
Ability Level Comparison - Abilities with importance scores over 50			
Description	Mechanical Engineering Technicians	Electrical Engineering Technicians	Importance
Problem Sensitivity	66	48	68
Near Vision	64	57	68
Oral Comprehension	69	62	65
Deductive Reasoning	71	59	65
Written Comprehension	71	60	62
Oral Expression	69	62	59
Inductive Reasoning	66	51	59
Written Expression	62	60	56
Finger Dexterity	53	42	53
Information Ordering	67	57	50
Visualization	64	53	50



Arm-Hand Steadiness	46	46	50
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Critical Thinking	54	67	73
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Knowledge Level Comparison - Knowledge with importance scores over 69			
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Experience & Education Comparison					
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10+ years	10%	0%	Doctoral	0%	0%
8-10 years	1%	2%	Professional Degree	0%	0%
6-8 years	7%	19%	Post-Masters Cert	0%	2%
4-6 years	2%	14%	Master's Degree	0%	0%
2-4 years	39%	28%	Post-Bachelor Cert	0%	0%
1-2 years	10%	23%	Bachelors	43%	21%
6-12 months	0%	0%	AA or Equiv	23%	24%
3-6 months	4%	0%	Some College	0%	32%
1-3 months	11%	0%	Post-Secondary Certificate	14%	19%
0-1 month	0%	0%	High School Diploma or GED	16%	0%
None	11%	12%	No HSD or GED	0%	0%
Mechanical Engineering Technicians			Electrical Engineering Technicians		
Most Common Educational/Training Requirement:					
Associate degree			Associate degree		
Job Zone Comparison					
3 - Job Zone Three: Medium Preparation Needed			3 - Job Zone Three: Medium Preparation Needed		
<p>Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.</p> <p>Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.</p> <p>Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.</p>			<p>Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.</p> <p>Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.</p> <p>Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.</p>		



## Tasks

### Mechanical Engineering Technicians

#### Core Tasks

##### Generalized Work Activities:

- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
- Evaluating Information to Determine Compliance with Standards - Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.

#### Specific Tasks

##### Occupation Specific Tasks:

- Analyze test results in relation to design or rated specifications and test objectives, and modify or adjust equipment to meet specifications.
- Calculate required capacities for equipment of proposed system to obtain specified performance and submit data to engineering personnel for approval.
- Confer with technicians and submit reports of test results to engineering department and recommend design or material changes.
- Devise, fabricate, and assemble new or modified mechanical components for products such as industrial machinery or equipment, and measuring instruments.
- Discuss changes in design, method of manufacture and assembly, and drafting techniques and procedures with staff and coordinate corrections.
- Draft detail drawing or sketch for drafting room completion or to request parts fabrication by machine, sheet or wood shops.
- Estimate cost factors including labor and material for purchased and fabricated parts and costs for assembly, testing, or installing.
- Evaluate tool drawing designs by measuring drawing dimensions and comparing with original specifications for form and function

### Electrical Engineering Technicians

#### Core Tasks

##### Generalized Work Activities:

- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
- Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Updating and Using Relevant Knowledge - Keeping up-to-date technically and applying new knowledge to your job.
- Processing Information - Compiling, coding, categorizing, calculating, tabulating, auditing, or verifying information or data.

#### Specific Tasks

##### Occupation Specific Tasks:

- Analyze and interpret test information to resolve design-related problems.
- Assemble electrical and electronic systems and prototypes according to engineering data and knowledge of electrical principles, using hand tools and measuring instruments.
- Build, calibrate, maintain, troubleshoot and repair electrical instruments or testing equipment.
- Collaborate with electrical engineers and other personnel to identify, define, and solve developmental problems.
- Conduct inspections for quality control and assurance programs, reporting findings and recommendations.
- Draw or modify diagrams and write engineering specifications to clarify design details and functional criteria of experimental electronics units.
- Evaluate engineering proposals, shop drawings and design comments for sound electrical engineering practice and conformance with established safety and design criteria, and recommend approval or disapproval.
- Install and maintain electrical control systems and solid state equipment.
- Modify electrical prototypes, parts, assemblies, and systems to correct functional deviations.
- Perform supervisory duties such as



using engineering skills.

- Inspect lines and figures for clarity and return erroneous drawings to designer for correction.
- Operate drill press, grinders, engine lathe, or other machines to modify parts tested or to fabricate experimental parts for testing.
- Prepare parts sketches and write work orders and purchase requests to be furnished by outside contractors.
- Read dials and meters to determine amperage, voltage, electrical output and input at specific operating temperature to analyze parts performance.
- Record test procedures and results, numerical and graphical data, and recommendations for changes in product or test methods.
- Review project instructions and blueprints to ascertain test specifications, procedures, and objectives, and test nature of technical problems such as redesign.
- Review project instructions and specifications to identify, modify and plan requirements fabrication, assembly and testing.
- Set up and conduct tests of complete units and components under operational conditions to investigate proposals for improving equipment performance.
- Set up prototype and test apparatus and operate test controlling equipment to observe and record prototype test results.
- Test equipment, using test devices attached to generator, voltage regulator, or other electrical parts, such as generators or spark plugs.

#### Detailed Tasks

##### Detailed Work Activities:

- analyze engineering design problems
- analyze engineering test data
- analyze technical data, designs, or preliminary specifications
- calculate engineering specifications
- communicate technical information
- conduct performance testing
- confer with engineering, technical or manufacturing personnel
- develop plans for programs or projects
- diagnose mechanical problems in machinery or equipment
- draw prototypes, plans, or maps to scale
- estimate cost for engineering projects
- evaluate engineering data
- examine engineering documents for completeness or accuracy
- fill out purchase requisitions
- follow manufacturing methods or techniques
- follow statistical process control procedures

recommending work assignments, approving leaves and completing performance evaluations.

- Plan method and sequence of operations for developing and testing experimental electronic and electrical equipment.
- Plan, schedule and monitor work of support personnel to assist supervisor.
- Prepare contracts and initiate, review and coordinate modifications to contract specifications and plans throughout the construction process.
- Prepare project cost and work-time estimates.
- Provide technical assistance and resolution when electrical or engineering problems are encountered before, during, and after construction.
- Review existing electrical engineering criteria to identify necessary revisions, deletions or amendments to outdated material.
- Set up and operate test equipment to evaluate performance of developmental parts, assemblies, or systems under simulated operating conditions, and record results.
- Visit construction sites to observe conditions impacting design and to identify solutions to technical design problems involving electrical systems equipment that arise during construction.
- Write commissioning procedures for electrical installations.

#### Detailed Tasks

##### Detailed Work Activities:

- analyze engineering test data
- analyze technical data, designs, or preliminary specifications
- analyze test data
- calculate engineering specifications
- calibrate or adjust electronic equipment or instruments to specification
- communicate technical information
- confer with engineering, technical or manufacturing personnel
- develop plans for programs or projects
- draw prototypes, plans, or maps to scale
- estimate cost for engineering projects
- evaluate engineering data
- fabricate, assemble, or disassemble manufactured products by hand
- follow manufacturing methods or techniques
- follow statistical process control procedures
- inspect facilities or equipment for regulatory compliance
- install electronic equipment, components, or systems
- install, maintain, or repair electronics



- inspect facilities or equipment for regulatory compliance
- modify electrical or electronic equipment or products
- operate metal or plastic fabricating equipment/machinery
- operate pneumatic test equipment
- operate precision test equipment
- prepare technical reports or related documentation
- read blueprints
- read schematics
- read technical drawings
- read vehicle manufacturer's specifications
- recommend solutions to engineering problems
- record test results, test procedures, or inspection data
- set up and operate variety of machine tools
- test equipment as part of engineering projects or processes
- understand engineering data or reports
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use drafting or mechanical drawing techniques
- use electrical or electronic test devices or equipment
- use knowledge of metric system
- use precision measuring tools or equipment
- use robotics systems technology
- use scientific research methodology
- use technical information in manufacturing or industrial activities
- use technical regulations for engineering problems

Technology - Examples

Analytical or scientific software

- ANSYS Mechanical
- MSC Software Adams
- Spectral Dynamics STARAcoustics
- Spectral Dynamics STARMDal
- The Mathworks MATLAB
- Wolfram Research Mathematica

Computer aided design CAD software

- Autodesk AutoCAD Mechanical
- Autodesk Inventor
- Bentley MicroStation

manufacturing equipment

- install/connect electrical equipment to power circuit
- manage contracts
- modify electrical or electronic equipment or products
- operate precision test equipment
- prepare technical reports or related documentation
- read blueprints
- read manufacturing outlines for electronic products
- read schematics
- read technical drawings
- repair computer controlled manufacturing systems
- repair electronic components, equipment, or systems
- resolve engineering or science problems
- solder electrical or electronic connections or components
- test equipment as part of engineering projects or processes
- troubleshoot electronics manufacturing equipment
- understand detailed electronic design specifications
- understand engineering data or reports
- understand service or repair manuals
- understand technical information for electronic repair work
- understand technical operating, service or repair manuals
- use drafting or mechanical drawing techniques
- use electrical or electronic test devices or equipment
- use knowledge of metric system
- use precision measuring tools or equipment
- use robotics systems technology
- use scientific research methodology
- use technical information in manufacturing or industrial activities
- use technical regulations for engineering problems

Technology - Examples

Analytical or scientific software

- Mentor Graphics ModelSim
- Proportional integral derivative control PID software
- Root cause analysis software
- The Mathworks MATLAB

Computer aided design CAD software



• Bentley MicroStation

- Computer aided design CAD software
- IBM CATIA V5
- PTC Pro/ENGINEER software
- SolidWorks CAD software

Computer aided manufacturing CAM software

- CNC Mastercam
- Computer aided manufacturing CAM software
- Three-dimensional 3D solid modeling software

Development environment software

- Microsoft Visual Basic
- National Instruments LabVIEW

Industrial control software

- Computerized numerical control CNC programming software
- Robotic control software
- Soft Servo Systems LadderWorks PLC

Internet browser software

- Web browser software

Office suite software

- Microsoft Office

Presentation software

- Microsoft PowerPoint

Project management software

- Microsoft Project

Spreadsheet software

- Microsoft Excel

Word processing software

- Corel WordPerfect software
- Microsoft Word

Tools - Examples

- Accelerometers
- Adjustable wrenches
- Air compressors
- Clamp-on ammeters
- High-voltage amplifiers
- Anemometers

- Autodesk AutoCAD software

- Cadence software

- Computer aided design CAD software

- MicroSim Pspice

- OrCAD Capture

- Prentice Hall Electronic Workbench MultiSim

Data base user interface and query software

- Database software
- Oracle software

Development environment software

- Assembler
- C

- Verilog

Document management software

- Adobe Systems Adobe Acrobat software

Graphics or photo imaging software

- Graphics software

Industrial control software

- Rockwell RS Logix
- Rockwell RSView

Internet browser software

- Microsoft Internet Explorer

Object or component oriented development software

- Computer aided software engineering CASE tools

Office suite software

- Microsoft Office

Operating system software

- Emulators

Spreadsheet software

- Microsoft Excel
- Spreadsheet software

Word processing software

- Microsoft Word

Tools - Examples

- Pliers
- Wrenches



- Optical microscopes
- C clamps
- Dial calipers
- Electronic comparators
- Compression testing machines
- Coordinate measuring machines CMM
- Dynamometers
- Extrusion machines
- Fatigue testers
- Mill files
- Fluid meters
- Rotameters
- Force sensors
- Plane-parallel gauge blocks
- Arc welding equipment
- Bore gauges
- Go/no-go gauges
- Safety goggles
- Digitizing tablets
- Surface grinders
- Polishing machines
- Claw hammers
- Durometers
- Vernier height gauges
- Hex keys
- Impact testers
- Heat treatment furnaces
- Injection molders
- Metallographs
- Computerized numerical control CNC lathes
- Spirit levels
- Granite surface plates

- Dual power supplies
- Ammeters
- Wrist anti-static straps
- Microscopes
- Desktop computers
- Alternating current AC generators
- Digital cameras
- Direct current DC motors
- Dynamometers
- Frequency counters
- Nanosecond universal counters
- Current probes
- Harmonic analyzers
- Welding goggles
- Anti-static heel grounders
- Impedance meters
- Transformers
- Logic analyzers
- Spectrum analyzers
- Laser printers
- Lasers
- Bench lathes
- Magnetic pickup tools
- Programmable logic controllers PLC
- Microcomputers
- Computerized numerical control CNC machines
- Multimeters
- Notebook computers
- Ohmmeters
- Oscilloscopes
- Personal computers
- Phase shifters



- Load cells
- Locking pliers
- Long nose pliers
- Metal inert gas MIG welding equipment
- Marking gauges
- Bend test fixtures
- Programmable logic controllers PLC
- Micrometers
- Microprocessors
- Combination milling machines
- Milling machines
- Digital multimeters
- Laptop computers
- Nut drivers
- Oscilloscopes
- Personal computers
- Drafting plotters
- Positioning jigs
- Power drills
- Cylindrical grinders
- Belt sanders
- Band saws
- Pressure sensors
- Safety gloves
- Protractors
- Center punches
- Hacksaws
- Offset screwdrivers
- Scribes
- Shear testing fixtures
- Power shears
- Signal conditioners

- Phase shift indicators
- Digital plotters
- Dataloggers
- Direct current DC potentiometers
- Drills
- Power meters
- Power screwdrivers
- Q meters
- Screwdrivers
- Function generators
- Soldering equipment
- Desoldering stations
- Stroboscopes
- Wire wrap guns
- Cameras
- Wire strippers
- Tachometers
- Digital voltmeters DVM
- Wattmeters
- Welders
- Welding hoods
- Wire cutters
- Crimping pliers



- Signal generators
- Arc-joint pliers
- Socket sets
- Soldering equipment
- Combination squares
- Steel rules
- Strain gauges
- Wire strippers
- Measuring tapes
- Dies
- Temperature sensors
- Tensile testers
- Dynamic mechanical analyzers DMA
- Snap gauges
- Screw thread gauges
- Tungsten inert gas TIG welding equipment
- Twin-screw extruders
- Twist drills
- Ultrasound inspection equipment
- Utility knives
- Vacuum molders
- Freon recovery equipment
- Vibration testers
- Spot welders
- Welding masks
- Dry rod ovens
- Wire cutters
- Drill presses

### Labor Market Comparison

Maine Department of Labor.

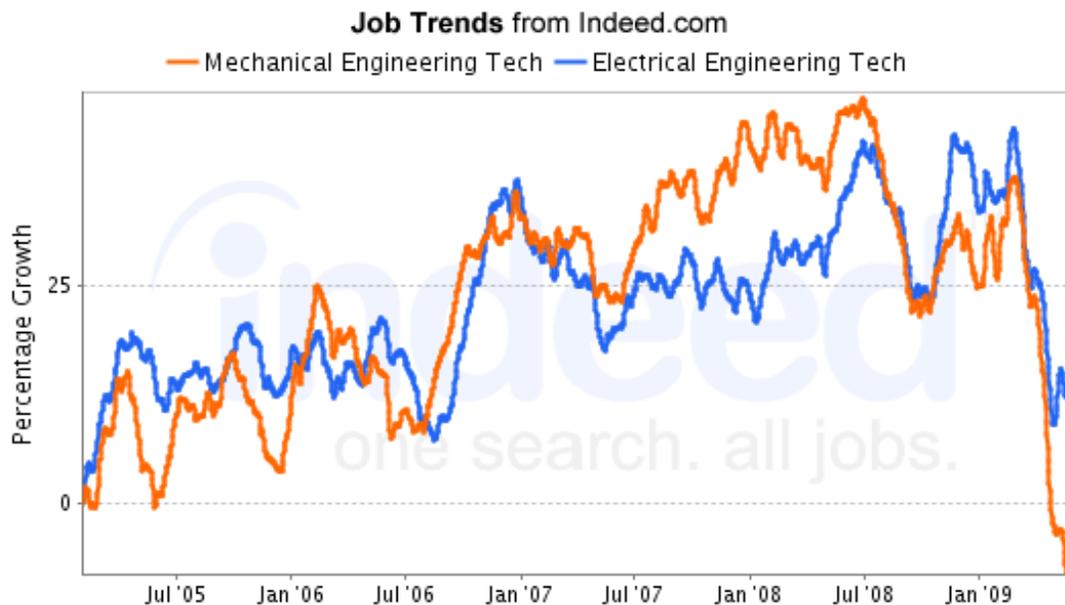
Description	Mechanical Engineering Technicians	Electrical Engineering Technicians	Difference
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Median Wage	\$ 44,890	\$ 45,180	\$ 290
10th Percentile Wage	\$ 30,530	\$ 25,770	\$(4,760)
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 51,860	\$ 61,600	\$ 9,740
90th Percentile Wage	\$ 61,330	\$ 79,100	\$ 17,770
Mean Wage	\$ 45,460	\$ 48,740	\$ 3,280
Total Employment - 2105	130	430	300
Employment Base - 2006	129	449	320
Projected Employment - 2114	132	361	229
Projected Job Growth - 2006-2114	2.3 %	-19.6 %	-21.9 %
Projected Annual Openings - 2006-2114	3	9	6
Special			
Special Occupations:			

### National Job Posting Trends

Trend for Mechanical Engineering Technicians and Electrical Engineering Technicians



Data from [Indeed](http://Indeed.com)

### Programs

Related Programs

Computer Engineering Technology/Technician



Computer Engineering Technology/Technician. A program that prepares individuals to apply basic engineering principles and technical skills in support of computer engineers engaged in designing and developing computer systems and installations. Includes instruction in computer electronics and programming, prototype development and testing, systems installation and testing, solid state and microminiature circuitry, peripheral equipment, and report preparation.

Institution	Address	City	URL
Southern Maine Community College	2 Fort Road	South Portland	<a href="http://www.smccME.edu">www.smccME.edu</a>

#### Computer Technology/Computer Systems Technology

Computer Technology/Computer Systems Technology. A program that prepares individuals to apply basic engineering principles and technical skills in support of professionals who use computer systems. Includes instruction in basic computer design and architecture, programming, problems of specific computer applications, component and system maintenance and inspection procedures, hardware and software problem diagnosis and repair, and report preparation.

No information on schools for the program

#### Electrical and Electronic Engineering Technologies/Technicians, Other

Electrical and Electronic Engineering Technologies/Technicians, Other. Any instructional program in electrical and electronic engineering-related technologies not listed above.

Institution	Address	City	URL
Eastern Maine Community College	354 Hogan Rd	Bangor	<a href="http://www.emcc.edu">www.emcc.edu</a>
Southern Maine Community College	2 Fort Road	South Portland	<a href="http://www.smccME.edu">www.smccME.edu</a>

#### Electrical, Electronic and Communications Engineering Technology/Technician

Electrical, Electronic and Communications Engineering Technology/Technician. A program that prepares individuals to apply basic engineering principles and technical skills in support of electrical, electronics and communication engineers. Includes instruction in electrical circuitry, prototype development and testing; systems analysis and testing, systems maintenance, instrument calibration, and report preparation.

Institution	Address	City	URL
Kennebec Valley Community College	92 Western Ave	Fairfield	<a href="http://www.kvcc.me.edu">www.kvcc.me.edu</a>
University of Maine		Orono	<a href="http://www.umaine.edu/">www.umaine.edu/</a>
Southern Maine Community College	2 Fort Road	South Portland	<a href="http://www.smccME.edu">www.smccME.edu</a>

#### Electromechanical Tech./Technician

Electromechanical Technology/Electromechanical Engineering Technology. A program that prepares individuals to apply basic engineering principles and technical skills in support of engineers engaged in developing and testing automated, servomechanical, and other electromechanical systems. Includes instruction in prototype testing, manufacturing and operational testing, systems analysis and maintenance procedures, and report preparation.

Institution	Address	City	URL
Central Maine Community College	1250 Turner St	Auburn	<a href="http://www.cmcc.edu">www.cmcc.edu</a>
Central Maine Community College	1250 Turner St	Auburn	<a href="http://www.cmcc.edu">www.cmcc.edu</a>



## Instrumentation Tech./Technician

Instrumentation Technology/Technician. A program that prepares individuals to apply basic engineering principles and technical skills in support of engineers engaged in developing control and measurement systems and procedures. Includes instruction in instrumentation design and maintenance, calibration, design and production testing and scheduling, automated equipment functions, applications to specific industrial tasks, and report preparation.

Institution	Address	City	URL
Northern Maine Community College	33 Edgemont Dr	Presque Isle	<a href="http://www.nmcc.edu">www.nmcc.edu</a>
Northern Maine Community College	33 Edgemont Dr	Presque Isle	<a href="http://www.nmcc.edu">www.nmcc.edu</a>

## Robotics Tech./Technician

Robotics Technology/Technician. A program that prepares individuals to apply basic engineering principles and technical skills in support of engineers and other professionals engaged in developing and using robots. Includes instruction in the principles of robotics, design and operational testing, system maintenance and repair procedures, robot computer systems and control language, specific system types and applications to specific industrial tasks, and report preparation.

No information on schools for the program

## Telecommunications Technology/Technician

Telecommunications Technology/Technician. A program that prepares individuals to apply basic engineering principles and technical skills to help design and implement telecommunications systems. Includes instruction in communications protocol, data networking, digital compression algorithms, digital signal processing, Internet access, object-oriented and relational databases, and programming languages.

Institution	Address	City	URL
Eastern Maine Community College	354 Hogan Rd	Bangor	<a href="http://www.emcc.edu">www.emcc.edu</a>

## Maine Statewide Promotion Opportunities for Mechanical Engineering Technicians

O*NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings	Special
17-3027.00	Mechanical Engineering Technicians	100	3	130	\$44,890.00	\$0.00	2%	3	
17-3023.03	Electrical Engineering Technicians	91	3	430	\$45,180.00	\$290.00	-20%	9	
27-1021.00	Commercial and Industrial Designers	91	4	140	\$49,170.00	\$4,280.00	5%	5	
17-3013.00	Mechanical Drafters	89	3	710	\$46,630.00	\$1,740.00	2%	22	
17-2141.00	Mechanical Engineers	89	4	620	\$67,210.00	\$22,320.00	-9%	14	



17-2072.00	Electronics Engineers, Except Computer	88	4	210	\$76,420.00	\$31,530.00	-26%	4	
17-2112.00	Industrial Engineers	87	4	580	\$68,350.00	\$23,460.00	11%	22	
17-2131.00	Materials Engineers	87	4	40	\$70,250.00	\$25,360.00	-7%	1	
17-3026.00	Industrial Engineering Technicians	86	3	370	\$51,700.00	\$6,810.00	6%	9	★
17-2121.02	Marine Architects	86	4	60	\$75,520.00	\$30,630.00	-9%	1	
51-4111.00	Tool and Die Makers	86	3	160	\$51,670.00	\$6,780.00	-11%	2	
17-2111.03	Product Safety Engineers	85	5	90	\$49,940.00	\$5,050.00	3%	3	
17-2031.00	Biomedical Engineers	84	4	20	\$86,560.00	\$41,670.00	-10%	1	
17-2071.00	Electrical Engineers	84	4	260	\$73,050.00	\$28,160.00	-10%	6	
17-2121.01	Marine Engineers	84	4	60	\$75,520.00	\$30,630.00	-9%	1	

Special Occupations:

### Top Industries for Electrical Engineering Technicians

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Semiconductor and other electronic component manufacturing	334400	11.11%	18,927	16,543	-12.59%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	7.00%	11,938	11,429	-4.26%
Employment services	561300	6.59%	11,227	14,209	26.56%
Wired telecommunications carriers	517100	5.49%	9,362	7,350	-21.49%
Federal government, excluding postal service	919999	5.23%	8,920	8,432	-5.47%
Postal service	491100	4.31%	7,344	7,476	1.80%
Electric power generation, transmission and distribution	221100	4.15%	7,078	6,510	-8.03%
Communications equipment manufacturing	334200	3.23%	5,503	5,547	0.79%
Research and development in the physical, engineering, and life sciences	541710	3.07%	5,233	5,583	6.69%
Electrical and electronic goods merchant wholesalers	423600	2.83%	4,829	5,693	17.90%
Computer and peripheral equipment manufacturing	334100	2.62%	4,464	2,922	-34.54%



Local government, excluding education and hospitals	939300	2.21%	3,764	4,228	12.34%
Computer systems design and related services	541500	1.90%	3,241	4,376	35.02%
Professional and commercial equipment and supplies merchant wholesalers	423400	1.69%	2,888	3,367	16.57%
Aerospace product and parts manufacturing	336400	1.59%	2,708	2,758	1.84%

### Top Industries for Mechanical Engineering Technicians

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Research and development in the physical, engineering, and life sciences	541710	8.52%	4,072	4,344	6.69%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	6.30%	3,013	2,884	-4.26%
Testing laboratories	541380	5.16%	2,467	3,037	23.12%
Other general purpose machinery manufacturing	333900	5.01%	2,393	2,376	-0.70%
Semiconductor and other electronic component manufacturing	334400	3.33%	1,593	1,392	-12.59%
Aerospace product and parts manufacturing	336400	3.02%	1,442	1,468	1.84%
Agriculture, construction, and mining machinery manufacturing	333100	2.58%	1,234	1,152	-6.63%
Employment services	561300	2.19%	1,047	1,325	26.56%
Industrial machinery manufacturing	333200	2.14%	1,022	921	-9.88%
Engine, turbine, and power transmission equipment manufacturing	333600	2.05%	980	822	-16.07%
Motor vehicle parts manufacturing	336300	2.00%	957	762	-20.39%
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	333400	1.94%	926	852	-8.01%
Medical equipment and supplies manufacturing	339100	1.78%	851	870	2.29%
Communications equipment manufacturing	334200	1.74%	833	839	0.79%
Commercial and service industry machinery manufacturing	333300	1.63%	780	684	-12.28%





Visualization	64	51	59
Speech Clarity	44	46	59
Category Flexibility	59	48	56
Selective Attention	44	37	56
Finger Dexterity	53	41	56
Written Expression	62	50	53
Perceptual Speed	53	35	53
Far Vision	48	44	53
Mathematical Reasoning	62	41	50
Number Facility	44	42	50
Flexibility of Closure	57	39	50
Visual Color Discrimination	55	44	50

Skill Level Comparison - Abilities with importance scores over 69

Description	Mechanical Engineering Technicians	Commercial and Industrial Designers	Importance
Speaking	60	63	69

Knowledge Level Comparison - Knowledge with importance scores over 69

Description	Mechanical Engineering Technicians	Commercial and Industrial Designers	Importance
Design	67	77	84
Mathematics	61	72	69

Experience & Education Comparison

Related Work Experience Comparison			Required Education Level Comparison		
Description	Mechanical Engineering Technicians	Commercial and Industrial Designers	Description	Mechanical Engineering Technicians	Commercial and Industrial Designers
10+ years	10%	0%	Doctoral	0%	0%
8-10 years	1%	0%	Professional Degree	0%	0%
6-8 years	7%	30%	Post-Masters Cert	0%	0%
4-6 years	2%	21%	Master's Degree	0%	7%
2-4 years	39%	9%	Post-Bachelor Cert	0%	6%
1-2 years	10%	12%	Bachelors	43%	55%
6-12 months	0%	9%	AA or Equiv	23%	18%
3-6 months	4%	6%	Some College	0%	0%
1-3 months	11%	9%	Post-Secondary Certificate	14%	9%
0-1 month	0%	0%	High School Diploma or GED	16%	2%
None	11%	0%	No HSD or GED	0%	0%

Mechanical Engineering Technicians

Commercial and Industrial Designers

Most Common Educational/Training Requirement:

Associate degree

Bachelor's degree

Job Zone Comparison

3 - Job Zone Three: Medium Preparation Needed

4 - Job Zone Four: Considerable Preparation Needed



<p>Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.</p>	<p>A minimum of two to four years of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.</p>
<p>Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.</p>	<p>Most of these occupations require a four - year bachelor's degree, but some do not.</p>
<p>Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.</p>	<p>Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training.</p>

## Tasks

Mechanical Engineering Technicians	Commercial and Industrial Designers
Core Tasks	Core Tasks
<p>Generalized Work Activities:</p> <ul style="list-style-type: none"> <li>• Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.</li> <li>• Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.</li> <li>• Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.</li> <li>• Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.</li> <li>• Evaluating Information to Determine Compliance with Standards - Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.</li> </ul>	<p>Generalized Work Activities:</p> <ul style="list-style-type: none"> <li>• Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.</li> <li>• Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.</li> <li>• Thinking Creatively - Developing, designing, or creating new applications, ideas, relationships, systems, or products, including artistic contributions.</li> <li>• Updating and Using Relevant Knowledge - Keeping up-to-date technically and applying new knowledge to your job.</li> <li>• Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.</li> <li>• Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.</li> </ul>
Specific Tasks	Specific Tasks
<p>Occupation Specific Tasks:</p> <ul style="list-style-type: none"> <li>• Analyze test results in relation to design or rated specifications and test objectives, and modify or adjust equipment to meet specifications.</li> <li>• Calculate required capacities for equipment of proposed system to obtain specified performance and submit data to engineering personnel for approval.</li> <li>• Confer with technicians and submit reports of test results to engineering department and recommend design or material changes.</li> <li>• Devise, fabricate, and assemble new or modified mechanical components for products such as industrial machinery or equipment, and measuring instruments.</li> <li>• Discuss changes in design, method of manufacture and assembly, and drafting techniques and procedures with staff and coordinate corrections.</li> </ul>	<p>Occupation Specific Tasks:</p> <ul style="list-style-type: none"> <li>• Advise corporations on issues involving corporate image projects or problems.</li> <li>• Confer with engineering, marketing, production, or sales departments, or with customers, to establish and evaluate design concepts for manufactured products.</li> <li>• Coordinate the look and function of product lines.</li> <li>• Design graphic material for use as ornamentation, illustration, or advertising on manufactured materials and packaging or containers.</li> <li>• Develop industrial standards and regulatory guidelines.</li> <li>• Develop manufacturing procedures and monitor the manufacture of their designs in</li> </ul>



- Draft detail drawing or sketch for drafting room completion or to request parts fabrication by machine, sheet or wood shops.
- Estimate cost factors including labor and material for purchased and fabricated parts and costs for assembly, testing, or installing.
- Evaluate tool drawing designs by measuring drawing dimensions and comparing with original specifications for form and function using engineering skills.
- Inspect lines and figures for clarity and return erroneous drawings to designer for correction.
- Operate drill press, grinders, engine lathe, or other machines to modify parts tested or to fabricate experimental parts for testing.
- Prepare parts sketches and write work orders and purchase requests to be furnished by outside contractors.
- Read dials and meters to determine amperage, voltage, electrical output and input at specific operating temperature to analyze parts performance.
- Record test procedures and results, numerical and graphical data, and recommendations for changes in product or test methods.
- Review project instructions and blueprints to ascertain test specifications, procedures, and objectives, and test nature of technical problems such as redesign.
- Review project instructions and specifications to identify, modify and plan requirements fabrication, assembly and testing.
- Set up and conduct tests of complete units and components under operational conditions to investigate proposals for improving equipment performance.
- Set up prototype and test apparatus and operate test controlling equipment to observe and record prototype test results.
- Test equipment, using test devices attached to generator, voltage regulator, or other electrical parts, such as generators or spark plugs.

#### Detailed Tasks

##### Detailed Work Activities:

- analyze engineering design problems
- analyze engineering test data
- analyze technical data, designs, or preliminary specifications
- calculate engineering specifications
- communicate technical information
- conduct performance testing
- confer with engineering, technical or manufacturing personnel
- develop plans for programs or projects
- diagnose mechanical problems in machinery

a factory to improve operations and product quality.

- Direct and coordinate the fabrication of models or samples and the drafting of working drawings and specification sheets from sketches.
- Evaluate feasibility of design ideas, based on factors such as appearance, safety, function, serviceability, budget, production costs/methods, and market characteristics.
- Fabricate models or samples in paper, wood, glass, fabric, plastic, metal, or other materials, using hand or power tools.
- Investigate product characteristics such as the product's safety and handling qualities, its market appeal, how efficiently it can be produced, and ways of distributing, using and maintaining it.
- Modify and refine designs, using working models, to conform with customer specifications, production limitations, or changes in design trends.
- Participate in new product planning or market research, including studying the potential need for new products.
- Prepare sketches of ideas, detailed drawings, illustrations, artwork, or blueprints, using drafting instruments, paints and brushes, or computer-aided design equipment.
- Present designs and reports to customers or design committees for approval, and discuss need for modification.
- Read publications, attend showings, and study competing products and design styles and motifs to obtain perspective and generate design concepts.
- Research production specifications, costs, production materials and manufacturing methods, and provide cost estimates and itemized production requirements.
- Supervise assistants' work throughout the design process.

#### Detailed Tasks

##### Detailed Work Activities:

- analyze market conditions
- analyze project proposal to determine feasibility, cost, or time
- analyze technical data, designs, or preliminary specifications
- communicate visually or verbally
- confer with client or staff regarding theme
- confer with other departmental heads to coordinate activities
- consult with customers concerning needs
- coordinate activities of assistants
- create art from ideas
- distinguish details in graphic arts material
- draw designs, letters, or lines
- draw prototypes, plans, or maps to scale



or equipment

- draw prototypes, plans, or maps to scale
- estimate cost for engineering projects
- evaluate engineering data
- examine engineering documents for completeness or accuracy
- fill out purchase requisitions
- follow manufacturing methods or techniques
- follow statistical process control procedures
- inspect facilities or equipment for regulatory compliance
- modify electrical or electronic equipment or products
- operate metal or plastic fabricating equipment/machinery
- operate pneumatic test equipment
- operate precision test equipment
- prepare technical reports or related documentation
- read blueprints
- read schematics
- read technical drawings
- read vehicle manufacturer's specifications
- recommend solutions to engineering problems
- record test results, test procedures, or inspection data
- set up and operate variety of machine tools
- test equipment as part of engineering projects or processes
- understand engineering data or reports
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use drafting or mechanical drawing techniques
- use electrical or electronic test devices or equipment
- use knowledge of metric system
- use precision measuring tools or equipment
- use robotics systems technology
- use scientific research methodology
- use technical information in manufacturing or industrial activities
- use technical regulations for engineering problems

#### Technology - Examples

##### Analytical or scientific software

- ANSYS Mechanical
- MSC Software Adams
- Spectral Dynamics STARAcoustics
- Spectral Dynamics STARMbdal

- estimate production costs
- evaluate product design
- evaluate product quality for sales activities
- fabricate craft or art objects
- follow manufacturing methods or techniques
- identify color or balance
- identify problems or improvements
- maintain consistent production quality
- make presentations
- organize commercial artistic or design projects
- prepare artwork for camera or press
- read blueprints
- recommend improvements to work methods or procedures
- recommend solutions of administrative problems
- schedule work to meet deadlines
- sketch or draw subjects or items
- understand artistic crafts production methods
- use characteristics of graphic design materials
- use computer aided drafting or design software for design, drafting, modeling, or other engineering tasks
- use computer graphics design software
- use computers to enter, access or retrieve data
- use creativity in graphics
- use creativity in industrial artistry
- use creativity to art or design work
- use drafting or mechanical drawing techniques
- use graphic arts techniques
- use hand or power tools
- use marketing techniques
- use product knowledge to market goods

#### Technology - Examples

##### Computer aided design CAD software

- Ashlar-Vellum Cobalt
- Autodesk AliasStudio
- Autodesk AutoCAD software
- Autodesk Maya software
- Dassault Systemes CATIA software
- PTC Pro/ENGINEER software
- Siemens PLM Software UGS NX
- SolidWorks CAD software



- The Mathworks MATLAB

- Wolfram Research Mathematica

#### Computer aided design CAD software

- Autodesk AutoCAD Mechanical

- Autodesk Inventor

- Bentley MicroStation

- Computer aided design CAD software

- IBM CATIA V5

- PTC Pro/ENGINEER software

- SolidWorks CAD software

#### Computer aided manufacturing CAM software

- CNC Mastercam

- Computer aided manufacturing CAM software

- Three-dimensional 3D solid modeling software

#### Development environment software

- Microsoft Visual Basic

- National Instruments LabVIEW

#### Industrial control software

- Computerized numerical control CNC programming software

- Robotic control software

- Soft Servo Systems LadderWorks PLC

#### Internet browser software

- Web browser software

#### Office suite software

- Microsoft Office

#### Presentation software

- Microsoft PowerPoint

#### Project management software

- Microsoft Project

#### Spreadsheet software

- Microsoft Excel

#### Word processing software

- Corel WordPerfect software

- Microsoft Word

#### Tools - Examples

#### Data base user interface and query software

- Microsoft Access

#### Desktop publishing software

- Adobe Systems Adobe InDesign

- Microsoft Publisher

- QuarkXpress

#### Document management software

- Adobe Systems Adobe Acrobat software

#### Electronic mail software

- Email software

#### Graphics or photo imaging software

- Adobe Systems Adobe FreeHand

- Adobe Systems Adobe Illustrator

- Adobe Systems Adobe Photoshop software

- Corel CorelDraw Graphics Suite

- Corel Painter

- McNeel Rhino software

- Xara Xtreme

#### Internet browser software

- Web browser software

#### Office suite software

- Microsoft Office

#### Presentation software

- Microsoft PowerPoint

#### Spreadsheet software

- Microsoft Excel

#### Video creation and editing software

- Autodesk 3ds Max

- Chaos Group V-Ray

- MAXON CINEMA 4D

- Softimage XSI

#### Word processing software

- Microsoft Word

#### Tools - Examples

- Desktop computers

- Compact digital cameras



- Accelerometers
- Adjustable wrenches
- Air compressors
- Clamp-on ammeters
- High-voltage amplifiers
- Anemometers
- Optical microscopes
- C clamps
- Dial calipers
- Electronic comparators
- Compression testing machines
- Coordinate measuring machines CMM
- Dynamometers
- Extrusion machines
- Fatigue testers
- Mill files
- Fluid meters
- Rotameters
- Force sensors
- Plane-parallel gauge blocks
- Arc welding equipment
- Bore gauges
- Go/no-go gauges
- Safety goggles
- Digitizing tablets
- Surface grinders
- Polishing machines
- Claw hammers
- Durometers
- Vernier height gauges
- Hex keys
- Impact testers
- Universal serial bus USB flash drives
- Liquid crystal display LCD video projectors
- Laptop computers
- Personal computers



- Heat treatment furnaces
- Injection molders
- Metallographs
- Computerized numerical control CNC lathes
- Spirit levels
- Granite surface plates
- Load cells
- Locking pliers
- Long nose pliers
- Metal inert gas MIG welding equipment
- Marking gauges
- Bend test fixtures
- Programmable logic controllers PLC
- Micrometers
- Microprocessors
- Combination milling machines
- Milling machines
- Digital multimeters
- Laptop computers
- Nut drivers
- Oscilloscopes
- Personal computers
- Drafting plotters
- Positioning jigs
- Power drills
- Cylindrical grinders
- Belt sanders
- Band saws
- Pressure sensors
- Safety gloves
- Protractors
- Center punches



- Hacksaws
- Offset screwdrivers
- Scribes
- Shear testing fixtures
- Power shears
- Signal conditioners
- Signal generators
- Arc-joint pliers
- Socket sets
- Soldering equipment
- Combination squares
- Steel rules
- Strain gauges
- Wire strippers
- Measuring tapes
- Dies
- Temperature sensors
- Tensile testers
- Dynamic mechanical analyzers DMA
- Snap gauges
- Screw thread gauges
- Tungsten inert gas TIG welding equipment
- Twin-screw extruders
- Twist drills
- Ultrasound inspection equipment
- Utility knives
- Vacuum molders
- Freon recovery equipment
- Vibration testers
- Spot welders
- Welding masks
- Dry rod ovens



- Wire cutters
- Drill presses

### Labor Market Comparison

Maine Department of Labor.

Description	Mechanical Engineering Technicians	Commercial and Industrial Designers	Difference
Median Wage	\$ 44,890	\$ 49,170	\$ 4,280
10th Percentile Wage	\$ 30,530	\$ 29,790	\$( 740)
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 51,860	\$ 72,210	\$ 20,350
90th Percentile Wage	\$ 61,330	\$ 81,030	\$ 19,700
Mean Wage	\$ 45,460	\$ 53,870	\$ 8,410
Total Employment - 2105	130	140	10
Employment Base - 2006	129	153	24
Projected Employment - 2114	132	160	28
Projected Job Growth - 2006-2114	2.3 %	4.6 %	2.3 %
Projected Annual Openings - 2006-2114	3	5	2
Special			

Special Occupations:

### National Job Posting Trends

Trend for Mechanical Engineering Technicians and Commercial and Industrial Designers



Programs			
Related Programs			
Commercial and Advertising Art			
<p>Commercial and Advertising Art. A program in the applied visual arts that prepares individuals to use artistic techniques to effectively communicate ideas and information to business and consumer audiences via illustrations and other forms of digital or printed media. Includes instruction in concept design, layout, paste-up, and techniques such as engraving, etching, silkscreen, lithography, offset, drawing and cartooning, painting, collage, and computer graphics.</p> <p>No information on schools for the program</p>			
Design and Applied Arts, Other			
<p>Design and Applied Arts, Other. Any instructional program in design and applied arts not listed above.</p> <p>No information on schools for the program</p>			
Design and Visual Communications			
<p>Design and Visual Communications, General. A program in the applied visual arts that focuses on the general principles and techniques for effectively communicating ideas and information, and packaging products, in digital and other formats to business and consumer audiences, and that may prepare individuals in any of the applied art media.</p>			
Institution	Address	City	URL
Maine College of Art	97 Spring St	Portland	<a href="http://www.meca.edu">www.meca.edu</a>
York County Community College	112 College Drive	Wells	<a href="http://www.yccc.edu">www.yccc.edu</a>
Fashion Design and Illustration			
<p>Fashion/Apparel Design. A program that prepares individuals to apply artistic principles and techniques to the professional design of commercial fashions, apparel, and accessories, and the management of fashion development projects. Includes instruction in apparel design; accessory design; the design of men's, women's, and children's wear; flat pattern design; computer-assisted design and manufacturing; concept planning; designing in specific materials; labor and cost analysis; history of fashion; fabric art and printing; and the principles of management and operations in the fashion industry.</p>			



No information on schools for the program

#### Industrial Design

Industrial Design. A program in the applied visual arts that prepares individuals to use artistic techniques to effectively communicate ideas and information to business and consumer audiences via the creation of effective forms, shapes, and packaging for manufactured products. Includes instruction in designing in a wide variety of plastic and digital media, prototype construction, design development and refinement, principles of cost saving, and product structure and performance criteria relevant to aesthetic design parameters.

No information on schools for the program

#### Technical Theater/Theater Design and Stagecraft

Technical Theatre/Theatre Design and Technology. A program that prepares individuals to apply artistic, technical and dramatic principles and techniques to the communication of dramatic information, ideas, moods, and feelings through technical theatre methods. Includes instruction in set design, lighting design, sound effects, theatre acoustics, scene painting, property management, costume design, and technical direction and production and use of computer applications to support these functions above.

No information on schools for the program

### Maine Statewide Promotion Opportunities for Mechanical Engineering Technicians

O*NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings	Special
17-3027.00	Mechanical Engineering Technicians	100	3	130	\$44,890.00	\$0.00	2%	3	
17-3023.03	Electrical Engineering Technicians	91	3	430	\$45,180.00	\$290.00	-20%	9	
27-1021.00	Commercial and Industrial Designers	91	4	140	\$49,170.00	\$4,280.00	5%	5	
17-3013.00	Mechanical Drafters	89	3	710	\$46,630.00	\$1,740.00	2%	22	
17-2141.00	Mechanical Engineers	89	4	620	\$67,210.00	\$22,320.00	-9%	14	
17-2072.00	Electronics Engineers, Except Computer	88	4	210	\$76,420.00	\$31,530.00	-26%	4	
17-2112.00	Industrial Engineers	87	4	580	\$68,350.00	\$23,460.00	11%	22	
17-2131.00	Materials Engineers	87	4	40	\$70,250.00	\$25,360.00	-7%	1	
17-3026.00	Industrial Engineering Technicians	86	3	370	\$51,700.00	\$6,810.00	6%	9	★
17-2121.02	Marine Architects	86	4	60	\$75,520.00	\$30,630.00	-9%	1	
51-4111.00	Tool and Die Makers	86	3	160	\$51,670.00	\$6,780.00	-11%	2	



17-2111.03	Product Safety Engineers	85	5	90	\$49,940.00	\$5,050.00	3%	3
17-2031.00	Biomedical Engineers	84	4	20	\$86,560.00	\$41,670.00	-10%	1
17-2071.00	Electrical Engineers	84	4	260	\$73,050.00	\$28,160.00	-10%	6
17-2121.01	Marine Engineers	84	4	60	\$75,520.00	\$30,630.00	-9%	1
Special Occupations:								

### Top Industries for Commercial and Industrial Designers

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Self-employed workers, primary job	000601	25.29%	12,136	12,929	6.54%
Specialized design services	541400	8.84%	4,243	5,678	33.81%
Management of companies and enterprises	551100	5.03%	2,414	2,783	15.28%
Self-employed workers, secondary job	000602	4.50%	2,158	2,148	-0.45%
Motor vehicle parts manufacturing	336300	2.70%	1,296	1,032	-20.39%
Employment services	561300	2.16%	1,038	1,314	26.56%
Plastics product manufacturing	326100	1.90%	910	965	6.00%
Miscellaneous durable goods merchant wholesalers	423900	1.40%	674	774	14.80%
Advertising and related services	541800	1.37%	657	741	12.83%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	1.13%	541	518	-4.26%
Research and development in the physical, engineering, and life sciences	541710	1.11%	533	569	6.69%
Other general purpose machinery manufacturing	333900	0.94%	452	408	-9.73%
Medical equipment and supplies manufacturing	339100	0.91%	437	447	2.29%
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	333400	0.90%	430	396	-8.01%
Household appliance manufacturing	335200	0.86%	410	311	-24.33%

### Top Industries for Mechanical Engineering Technicians

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Research and development in the physical, engineering, and life sciences	541710	8.52%	4,072	4,344	6.69%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	6.30%	3,013	2,884	-4.26%



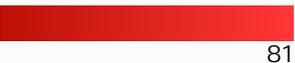
Testing laboratories	541380	5.16%	2,467	3,037	23.12%
Other general purpose machinery manufacturing	333900	5.01%	2,393	2,376	-0.70%
Semiconductor and other electronic component manufacturing	334400	3.33%	1,593	1,392	-12.59%
Aerospace product and parts manufacturing	336400	3.02%	1,442	1,468	1.84%
Agriculture, construction, and mining machinery manufacturing	333100	2.58%	1,234	1,152	-6.63%
Employment services	561300	2.19%	1,047	1,325	26.56%
Industrial machinery manufacturing	333200	2.14%	1,022	921	-9.88%
Engine, turbine, and power transmission equipment manufacturing	333600	2.05%	980	822	-16.07%
Motor vehicle parts manufacturing	336300	2.00%	957	762	-20.39%
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	333400	1.94%	926	852	-8.01%
Medical equipment and supplies manufacturing	339100	1.78%	851	870	2.29%
Communications equipment manufacturing	334200	1.74%	833	839	0.79%
Commercial and service industry machinery manufacturing	333300	1.63%	780	684	-12.28%



# TORQ Analysis of Mechanical Engineering Technicians to Civil Drafters

ANALYSIS INPUT					
Transfer	Title	O*NET	Filters		
From Title:	Mechanical Engineering Technicians	17-3027.00	Abilities:	Importance Level: 50	Weight: 1
To Title:	Civil Drafters	17-3011.02	Skills:	Importance Level: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

TORQ RESULTS											
Grand TORQ:								89			
Ability TORQ			Skills TORQ			Knowledge TORQ					
Level		94	Level		91	Level		82			
Gaps To Narrow if Possible				Upgrade These Skills				Knowledge to Add			
Ability	Level	Gap	Impt	Skill	Level	Gap	Impt	Knowledge	Level	Gap	Impt
Number Facility	60	16	56	No Skills Upgrade Required!				Computers and Electronics	65	7	83
Far Vision	59	11	62					Design	72	5	75
Near Vision	71	7	81								
Speech Recognition	51	9	62								
Visualization	71	7	75								
Speech Clarity	50	6	62								
Speed of Closure	46	5	50								
Flexibility of Closure	60	3	72								
Arm-Hand Steadiness	50	4	50								
Originality	57	2	62								
LEVEL and IMPT (IMPORTANCE) refer to the Target Civil Drafters. GAP refers to level difference between Mechanical Engineering Technicians and Civil Drafters.											

ASK ANALYSIS			
Ability Level Comparison - Abilities with importance scores over 50			
Description	Mechanical Engineering Technicians	Civil Drafters	Importance
Near Vision	64 	71 	81 
Written Comprehension	71 	67 	75 



Inductive Reasoning	66	60	75
Visualization	64	71	75
Problem Sensitivity	66	64	72
Flexibility of Closure	57	60	72
Oral Comprehension	69	69	68
Deductive Reasoning	71	59	68
Oral Expression	69	67	65
Information Ordering	67	59	65
Mathematical Reasoning	62	62	65
Perceptual Speed	53	50	65
Originality	55	57	62
Selective Attention	44	44	62
Far Vision	48	59	62
Speech Recognition	42	51	62
Speech Clarity	44	50	62
Written Expression	62	57	59
Fluency of Ideas	51	51	59
Category Flexibility	59	57	59
Number Facility	44	60	56
Finger Dexterity	53	44	53
Visual Color Discrimination	55	44	53
Memorization	50	46	50
Speed of Closure	41	46	50
Arm-Hand Steadiness	46	50	50

Skill Level Comparison - Abilities with importance scores over 69

Description	Mechanical Engineering Technicians	Civil Drafters	Importance
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Knowledge Level Comparison - Knowledge with importance scores over 69

Description	Mechanical Engineering Technicians	Civil Drafters	Importance
Computers and Electronics	58	65	83
Design	67	72	75

### Experience & Education Comparison

Related Work Experience Comparison			Required Education Level Comparison		
Description	Mechanical Engineering Technicians	Civil Drafters	Description	Mechanical Engineering Technicians	Civil Drafters
10+ years	10%	0%	Doctoral	0%	0%
8-10 years	1%	0%	Professional Degree	0%	0%
6-8 years	7%	0%	Post-Masters Cert	0%	0%
4-6 years	2%	4%			



2-4 years	39%	10%	Master's Degree	0%	0%
1-2 years	10%	40%	Post-Bachelor Cert	0%	0%
6-12 months	0%	25%	Bachelors	43%	22%
3-6 months	4%	1%	AA or Equiv	23%	14%
1-3 months	11%	0%	Some College	0%	13%
0-1 month	0%	0%	Post-Secondary Certificate	14%	21%
None	11%	16%	High School Diploma or GED	16%	27%
			No HSD or GED	0%	0%

Mechanical Engineering Technicians	Civil Drafters
<b>Most Common Educational/Training Requirement:</b>	
Associate degree	Postsecondary vocational award
<b>Job Zone Comparison</b>	
3 - Job Zone Three: Medium Preparation Needed	3 - Job Zone Three: Medium Preparation Needed
Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.	Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.
Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.

<b>Tasks</b>	
Mechanical Engineering Technicians	Civil Drafters
Core Tasks	Core Tasks
Generalized Work Activities:	Generalized Work Activities:
<ul style="list-style-type: none"> <li>• Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.</li> <li>• Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.</li> <li>• Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.</li> <li>• Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.</li> <li>• Evaluating Information to Determine Compliance with Standards - Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.</li> </ul>	<ul style="list-style-type: none"> <li>• Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.</li> <li>• Drafting, Laying Out, and Specifying Technical Devices, Parts, and Equipment - Providing documentation, detailed instructions, drawings, or specifications to tell others about how devices, parts, equipment, or structures are to be fabricated, constructed, assembled, modified, maintained, or used.</li> <li>• Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.</li> <li>• Thinking Creatively - Developing, designing, or creating new applications, ideas, relationships, systems, or products, including artistic contributions.</li> <li>• Estimating the Quantifiable Characteristics of Products, Events, or Information - Estimating sizes, distances, and quantities; or determining time, costs, resources, or materials needed to perform a work activity.</li> </ul>
Specific Tasks	Specific Tasks
Occupation Specific Tasks:	Specific Tasks



- Analyze test results in relation to design or rated specifications and test objectives, and modify or adjust equipment to meet specifications.
- Calculate required capacities for equipment of proposed system to obtain specified performance and submit data to engineering personnel for approval.
- Confer with technicians and submit reports of test results to engineering department and recommend design or material changes.
- Devise, fabricate, and assemble new or modified mechanical components for products such as industrial machinery or equipment, and measuring instruments.
- Discuss changes in design, method of manufacture and assembly, and drafting techniques and procedures with staff and coordinate corrections.
- Draft detail drawing or sketch for drafting room completion or to request parts fabrication by machine, sheet or wood shops.
- Estimate cost factors including labor and material for purchased and fabricated parts and costs for assembly, testing, or installing.
- Evaluate tool drawing designs by measuring drawing dimensions and comparing with original specifications for form and function using engineering skills.
- Inspect lines and figures for clarity and return erroneous drawings to designer for correction.
- Operate drill press, grinders, engine lathe, or other machines to modify parts tested or to fabricate experimental parts for testing.
- Prepare parts sketches and write work orders and purchase requests to be furnished by outside contractors.
- Read dials and meters to determine amperage, voltage, electrical output and input at specific operating temperature to analyze parts performance.
- Record test procedures and results, numerical and graphical data, and recommendations for changes in product or test methods.
- Review project instructions and blueprints to ascertain test specifications, procedures, and objectives, and test nature of technical problems such as redesign.
- Review project instructions and specifications to identify, modify and plan requirements fabrication, assembly and testing.
- Set up and conduct tests of complete units and components under operational conditions to investigate proposals for improving equipment performance.
- Set up prototype and test apparatus and operate test controlling equipment to observe and record prototype test results.

#### Occupation Specific Tasks:

- Analyze building codes, by-laws, space and site requirements, and other technical documents and reports to determine their effect on architectural designs.
- Analyze technical implications of architect's design concept, calculating weights, volumes, and stress factors.
- Build landscape, architectural and display models.
- Calculate heat loss and gain of buildings and structures to determine required equipment specifications, following standard procedures.
- Check dimensions of materials to be used and assign numbers to lists of materials.
- Coordinate structural, electrical and mechanical designs and determine a method of presentation to graphically represent building plans.
- Create freehand drawings and lettering to accompany drawings.
- Determine procedures and instructions to be followed, according to design specifications and quantity of required materials.
- Draw rough and detailed scale plans for foundations, buildings and structures, based on preliminary concepts, sketches, engineering calculations, specification sheets and other data.
- Lay out and plan interior room arrangements for commercial buildings using computer-assisted drafting (CAD) equipment and software.
- Obtain and assemble data to complete architectural designs, visiting job sites to compile measurements as necessary.
- Operate computer-aided drafting (CAD) equipment or conventional drafting station to produce designs, working drawings, charts, forms and records.
- Prepare colored drawings of landscape and interior designs for presentation to client.
- Prepare cost estimates, contracts, bidding documents and technical reports for specific projects under an architect's supervision.
- Represent architect on construction site, ensuring builder compliance with design specifications and advising on design corrections, under architect's supervision.
- Reproduce drawings on copy machines or trace copies of plans and drawings using transparent paper or cloth, ink, pencil, and standard drafting instruments.
- Supervise, coordinate, and inspect the work of draftspersons, technicians, and technologists on construction projects.

#### Detailed Tasks



- observe and record prototype test results
- Test equipment, using test devices attached to generator, voltage regulator, or other electrical parts, such as generators or spark plugs.

#### Detailed Tasks

##### Detailed Work Activities:

- analyze engineering design problems
- analyze engineering test data
- analyze technical data, designs, or preliminary specifications
- calculate engineering specifications
- communicate technical information
- conduct performance testing
- confer with engineering, technical or manufacturing personnel
- develop plans for programs or projects
- diagnose mechanical problems in machinery or equipment
- draw prototypes, plans, or maps to scale
- estimate cost for engineering projects
- evaluate engineering data
- examine engineering documents for completeness or accuracy
- fill out purchase requisitions
- follow manufacturing methods or techniques
- follow statistical process control procedures
- inspect facilities or equipment for regulatory compliance
- modify electrical or electronic equipment or products
- operate metal or plastic fabricating equipment/machinery
- operate pneumatic test equipment
- operate precision test equipment
- prepare technical reports or related documentation
- read blueprints
- read schematics
- read technical drawings
- read vehicle manufacturer's specifications
- recommend solutions to engineering problems
- record test results, test procedures, or inspection data
- set up and operate variety of machine tools
- test equipment as part of engineering projects or processes
- understand engineering data or reports
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use drafting or mechanical drawing techniques
- use electrical or electronic test devices or

##### Detailed Work Activities:

- analyze technical data, designs, or preliminary specifications
- collect scientific or technical data
- communicate technical information
- develop plans for programs or projects
- direct and coordinate activities of workers or staff
- draw maps or charts
- draw prototypes, plans, or maps to scale
- evaluate engineering data
- inspect project operations, or site to determine specification compliance
- interpret aerial photographs
- interpret maps for architecture, construction, or engineering project
- lay out electrical wiring for buildings, etc.
- prepare contract documents
- prepare cost estimates
- prepare technical reports or related documentation
- read blueprints
- read schematics
- read technical drawings
- recommend solutions to engineering problems
- research property records
- understand construction specifications
- understand engineering data or reports
- understand technical operating, service or repair manuals
- use computer aided drafting or design software for design, drafting, modeling, or other engineering tasks
- use computer graphics design software
- use computers to enter, access or retrieve data
- use drafting or mechanical drawing techniques
- use spreadsheet software
- use word processing or desktop publishing software
- write business project or bid proposals

#### Technology - Examples

##### Computer aided design CAD software

- Autodesk AutoCAD Civil 3D
- Autodesk AutoCAD software
- Autodesk Land Desktop
- Autodesk Softdesk
- Bentley Microstation



use knowledge of electronic test devices or equipment

- use knowledge of metric system
- use precision measuring tools or equipment
- use robotics systems technology
- use scientific research methodology
- use technical information in manufacturing or industrial activities
- use technical regulations for engineering problems

#### Technology - Examples

##### Analytical or scientific software

- ANSYS Mechanical
- MSC Software Adams
- Spectral Dynamics STARAcoustics
- Spectral Dynamics STARMbdal
- The Mathworks MATLAB
- Wolfram Research Mathematica

##### Computer aided design CAD software

- Autodesk AutoCAD Mechanical
- Autodesk Inventor
- Bentley MicroStation
- Computer aided design CAD software
- IBM CATIA V5
- PTC Pro/ENGINEER software
- SolidWorks CAD software

##### Computer aided manufacturing CAM software

- CNC Mastercam
- Computer aided manufacturing CAM software
- Three-dimensional 3D solid modeling software

##### Development environment software

- Microsoft Visual Basic
- National Instruments LabVIEW

##### Industrial control software

- Computerized numerical control CNC programming software
- Robotic control software
- Soft Servo Systems LadderWorks PLC

##### Internet browser software

- Web browser software

- Bentley WaterCAD

- ENERCALC FastFrame

- Piping and instrumentation design PID software

##### Data base user interface and query software

- Microsoft Access

##### Graphics or photo imaging software

- Adobe Systems Adobe After Effects
- Adobe Systems Adobe LiveMotion
- Adobe Systems Adobe Photoshop software
- Animation software
- Bentley GeoPak Bridge
- Graphic presentation software
- Intergraph Image Analyst
- Landscape modeling software
- McNeel Rhino software
- Motion graphics software
- Non uniform rational b-splines NURBS software
- Three-dimensional modeling software

##### Map creation software

- Boundary survey software
- ESRI ArcGIS software
- ESRI ArcView
- Geomechanical design analysis GDA software
- Topographic map software

##### Materials requirements planning logistics and supply chain software

- Bill of materials software

##### Optical character reader OCR or scanning software

- Scanning software

##### Presentation software

- Microsoft PowerPoint

##### Project management software

- ARCOM Masterspec

##### Spreadsheet software

- Microsoft Excel

##### Word processing software



## Office suite software

- Microsoft Office

## Presentation software

- Microsoft PowerPoint

## Project management software

- Microsoft Project

## Spreadsheet software

- Microsoft Excel

## Word processing software

- Corel WordPerfect software
- Microsoft Word

## Tools - Examples

- Accelerometers
- Adjustable wrenches
- Air compressors
- Clamp-on ammeters
- High-voltage amplifiers
- Anemometers
- Optical microscopes
- C clamps
- Dial calipers
- Electronic comparators
- Compression testing machines
- Coordinate measuring machines CMM
- Dynamometers
- Extrusion machines
- Fatigue testers
- Mill files
- Fluid meters
- Rotameters
- Force sensors
- Plane-parallel gauge blocks
- Arc welding equipment
- Bore gauges

- Microsoft Word

- Specification software

- SpecsInTact Software

## Tools - Examples

- Calculators
- Compasses
- Flexible curves
- Desktop computers
- Computer aided design CAD multi-unit display graphics cards
- Notebook computers
- Plotting printers
- Print servers
- Protractors
- Architects' scales
- Backlit digitizers
- T-squares
- Graphics tablets
- Estimating keypads
- Triangles



- Go/no-go gauges
- Safety goggles
- Digitizing tablets
- Surface grinders
- Polishing machines
- Claw hammers
- Durometers
- Vernier height gauges
- Hex keys
- Impact testers
- Heat treatment furnaces
- Injection molders
- Metallographs
- Computerized numerical control CNC lathes
- Spirit levels
- Granite surface plates
- Load cells
- Locking pliers
- Long nose pliers
- Metal inert gas MG welding equipment
- Marking gauges
- Bend test fixtures
- Programmable logic controllers PLC
- Micrometers
- Microprocessors
- Combination milling machines
- Milling machines
- Digital multimeters
- Laptop computers
- Nut drivers
- Oscilloscopes
- Personal computers



- Drafting plotters
- Positioning jigs
- Power drills
- Cylindrical grinders
- Belt sanders
- Band saws
- Pressure sensors
- Safety gloves
- Protractors
- Center punches
- Hacksaws
- Offset screwdrivers
- Scribes
- Shear testing fixtures
- Power shears
- Signal conditioners
- Signal generators
- Arc-joint pliers
- Socket sets
- Soldering equipment
- Combination squares
- Steel rules
- Strain gauges
- Wire strippers
- Measuring tapes
- Dies
- Temperature sensors
- Tensile testers
- Dynamic mechanical analyzers DMA
- Snap gauges
- Screw thread gauges
- Tungsten inert gas TIG welding equipment



- Twin-screw extruders
- Twist drills
- Ultrasound inspection equipment
- Utility knives
- Vacuum molders
- Freon recovery equipment
- Vibration testers
- Spot welders
- Welding masks
- Dry rod ovens
- Wire cutters
- Drill presses

### Labor Market Comparison

Maine Department of Labor.

Description	Mechanical Engineering Technicians	Civil Drafters	Difference
Median Wage	\$ 44,890	\$ 39,040	\$( 5,850)
10th Percentile Wage	\$ 30,530	\$ 30,300	\$( 230)
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 51,860	\$ 48,580	\$( 3,280)
90th Percentile Wage	\$ 61,330	\$ 57,380	\$( 3,950)
Mean Wage	\$ 45,460	\$ 41,250	\$( 4,210)
Total Employment - 2105	130	680	550
Employment Base - 2006	129	719	590
Projected Employment - 2114	132	731	599
Projected Job Growth - 2006-2114	2.3 %	1.7 %	-0.7 %
Projected Annual Openings - 2006-2114	3	22	19
Special			

Special Occupations:

### National Job Posting Trends

Trend for Mechanical Engineering Technicians and Civil Drafters



Programs			
Related Programs			
Architectural Drafting and Architectural CAD/CADD			
<p>Architectural Drafting and Architectural CAD/CADD. A program that prepares individuals to apply technical knowledge and skills to develop working drawings and electronic simulations for architectural and related construction projects. Includes instruction in basic construction and structural design, architectural rendering, architectural-aided drafting (CAD), layout and designs, architectural blueprint interpretation, building materials, and basic structural wiring diagramming.</p>			
Institution	Address	City	URL
Southern Maine Community College	2 Fort Road	South Portland	<a href="http://www.smccME.edu">www.smccME.edu</a>
Architectural Technology/Technician			
<p>Architectural Technology/Technician. A program that prepares individuals to assist architects in developing plans and related documentation and in performing architectural office services. Includes instruction in architectural drafting, computer-assisted drafting and design, construction methods and materials, environmental systems, building codes and standards, structural principles, cost estimation, planning documentation, visual communication skills, display production, and architectural office management.</p>			
Institution	Address	City	URL
University of Maine at Augusta	46 University Dr	Augusta	<a href="http://www.uma.maine.edu/">www.uma.maine.edu/</a>
University of Maine at Augusta	46 University Dr	Augusta	<a href="http://www.uma.maine.edu/">www.uma.maine.edu/</a>
CAD/CADD Drafting and/or Design Technology/Technician			



CAD/CADD Drafting and/or Design Technology/Technician. A program that prepares individuals to apply technical skills and advanced computer software and hardware to the creation of graphic representations and simulations in support of engineering projects. Includes instruction in engineering graphics, two-dimensional and three-dimensional engineering design, solids modeling, engineering animation, computer-aided drafting (CAD), computer-aided design (CADD), and auto-CAD techniques.

Institution	Address	City	URL
Eastern Maine Community College	354 Hogan Rd	Bangor	<a href="http://www.emcc.edu">www.emcc.edu</a>
Eastern Maine Community College	354 Hogan Rd	Bangor	<a href="http://www.emcc.edu">www.emcc.edu</a>
York County Community College	112 College Drive	Wells	<a href="http://www.yccc.edu">www.yccc.edu</a>
York County Community College	112 College Drive	Wells	<a href="http://www.yccc.edu">www.yccc.edu</a>

#### Civil Drafting and Civil Engineering CAD/CADD

Civil Drafting and Civil Engineering CAD/CADD. A program that prepares individuals to apply technical knowledge and skills to develop working drawing and electronic simulations in support of civil engineers, geological engineers, and related professionals. Includes instruction in basic civil engineering principles, geological and seismographic mapping, machine drafting, computer-aided drafting (CAD), pipe drafting, survey interpretation, and blueprint reading.

No information on schools for the program

#### Drafting and Design Technology/Technician, General

Drafting and Design Technology/Technician, General. A program that prepares individuals to generally apply technical skills to create working drawings and computer simulations for a variety of applications. Includes instruction in specification interpretation, dimensioning techniques, drafting calculations, material estimation, technical communications, computer applications, and interpersonal communications.

Institution	Address	City	URL
Kennebec Valley Community College	92 Western Ave	Fairfield	<a href="http://www.kvcc.me.edu">www.kvcc.me.edu</a>
Northern Maine Community College	33 Edgemont Dr	Presque Isle	<a href="http://www.nmcc.edu">www.nmcc.edu</a>
Northern Maine Community College	33 Edgemont Dr	Presque Isle	<a href="http://www.nmcc.edu">www.nmcc.edu</a>
Northern Maine Community College	33 Edgemont Dr	Presque Isle	<a href="http://www.nmcc.edu">www.nmcc.edu</a>
Southern Maine Community College	2 Fort Road	South Portland	<a href="http://www.smccME.edu">www.smccME.edu</a>

### Maine Statewide Promotion Opportunities for Mechanical Engineering Technicians

O*NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings	Special
17-3027.00	Mechanical Engineering Technicians	100	3	130	\$44,890.00	\$0.00	2%	3	
17-3023.03	Electrical Engineering Technicians	91	3	430	\$45,180.00	\$290.00	-20%	9	



27-1021.00	Commercial and Industrial Designers	91	4	140	\$49,170.00	\$4,280.00	5%	5	
17-3013.00	Mechanical Drafters	89	3	710	\$46,630.00	\$1,740.00	2%	22	
17-2141.00	Mechanical Engineers	89	4	620	\$67,210.00	\$22,320.00	-9%	14	
17-2072.00	Electronics Engineers, Except Computer	88	4	210	\$76,420.00	\$31,530.00	-26%	4	
17-2112.00	Industrial Engineers	87	4	580	\$68,350.00	\$23,460.00	11%	22	
17-2131.00	Materials Engineers	87	4	40	\$70,250.00	\$25,360.00	-7%	1	
17-3026.00	Industrial Engineering Technicians	86	3	370	\$51,700.00	\$6,810.00	6%	9	★
17-2121.02	Marine Architects	86	4	60	\$75,520.00	\$30,630.00	-9%	1	
51-4111.00	Tool and Die Makers	86	3	160	\$51,670.00	\$6,780.00	-11%	2	
17-2111.03	Product Safety Engineers	85	5	90	\$49,940.00	\$5,050.00	3%	3	
17-2031.00	Biomedical Engineers	84	4	20	\$86,560.00	\$41,670.00	-10%	1	
17-2071.00	Electrical Engineers	84	4	260	\$73,050.00	\$28,160.00	-10%	6	
17-2121.01	Marine Engineers	84	4	60	\$75,520.00	\$30,630.00	-9%	1	

Special Occupations:

### Top Industries for Civil Drafters

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Self-employed workers, primary job	000601	4.37%	5,053	5,097	0.87%
Residential building construction	236100	3.14%	3,630	3,871	6.62%
Nonresidential building construction	236200	2.48%	2,869	3,044	6.09%
Local government, excluding education and hospitals	939300	2.34%	2,706	2,878	6.36%
Architectural and structural metals manufacturing	332300	1.30%	1,500	1,517	1.12%
State government, excluding education and hospitals	929200	1.03%	1,193	1,108	-7.09%
Management of companies and enterprises	551100	0.78%	900	982	9.15%



Employment services	561300	0.69%	801	960	19.83%
Specialized design services	541400	0.68%	781	989	26.69%
Self-employed workers, secondary job	000602	0.64%	737	694	-5.74%
Other wood product manufacturing	321900	0.45%	525	469	-10.78%
Management, scientific, and technical consulting services	541600	0.41%	476	805	69.03%
Veneer, plywood, and engineered wood product manufacturing	321200	0.38%	439	452	3.10%
Colleges, universities, and professional schools, public and private	611300	0.35%	404	428	5.92%
Plumbing, heating, and air-conditioning contractors	238220	0.34%	388	414	6.92%

### Top Industries for Mechanical Engineering Technicians

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Research and development in the physical, engineering, and life sciences	541710	8.52%	4,072	4,344	6.69%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	6.30%	3,013	2,884	-4.26%
Testing laboratories	541380	5.16%	2,467	3,037	23.12%
Other general purpose machinery manufacturing	333900	5.01%	2,393	2,376	-0.70%
Semiconductor and other electronic component manufacturing	334400	3.33%	1,593	1,392	-12.59%
Aerospace product and parts manufacturing	336400	3.02%	1,442	1,468	1.84%
Agriculture, construction, and mining machinery manufacturing	333100	2.58%	1,234	1,152	-6.63%
Employment services	561300	2.19%	1,047	1,325	26.56%
Industrial machinery manufacturing	333200	2.14%	1,022	921	-9.88%
Engine, turbine, and power transmission equipment manufacturing	333600	2.05%	980	822	-16.07%
Motor vehicle parts manufacturing	336300	2.00%	957	762	-20.39%
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	333400	1.94%	926	852	-8.01%
Medical equipment and supplies manufacturing	339100	1.78%	851	870	2.29%
Communications equipment manufacturing	334200	1.74%	833	839	0.79%
Commercial and service industry machinery manufacturing	333300	1.63%	780	684	-12.28%



# TORQ Analysis of Mechanical Engineering Technicians to Mechanical Engineers

ANALYSIS INPUT					
Transfer	Title	O*NET	Filters		
From Title:	Mechanical Engineering Technicians	17-3027.00	Abilities:	Importance Level: 50	Weight: 1
To Title:	Mechanical Engineers	17-2141.00	Skills:	Importance Level: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

TORQ RESULTS					
Grand TORQ:					89
Ability TORQ		Skills TORQ		Knowledge TORQ	
Level	 94	Level	 78	Level	 96

Gaps To Narrow if Possible				Upgrade These Skills				Knowledge to Add			
Ability	Level	Gap	Impt	Skill	Level	Gap	Impt	Knowledge	Level	Gap	Impt
Number Facility	69	25	56	Science	85	34	77	Administration and Management	60	19	69
Oral Comprehension	80	11	78	Systems Analysis	61	22	76	Physics	49	8	72
Speed of Closure	55	14	50	Operations Analysis	76	19	81	Mechanical	77	2	74
Fluency of Ideas	62	11	56	Critical Thinking	86	20	76				
Originality	66	11	50	Mnitoring	68	17	71				
Speech Recognition	51	9	59	Writing	78	11	70				
Oral Expression	75	6	72	Social Perceptiveness	45	9	73				
Written Expression	69	7	59	Installation	58	8	74				
Category Flexibility	66	7	56	Active Listening	81	6	77				
Written Comprehension	76	5	75	Active Learning	73	3	71				
Problem Sensitivity	71	5	75								
Near Vision	69	5	72								
Selective Attention	50	6	59								
Mathematical Reasoning	67	5	59								
Speech Clarity	48	4	62								
Deductive Reasoning	73	2	72								
Visualization	66	2	62								
Far Vision	50	2	50								



LEVEL and IMPT (IMPORTANCE) refer to the Target Mechanical Engineers. GAP refers to level difference between Mechanical Engineering Technicians and Mechanical Engineers.

ASK ANALYSIS			
Ability Level Comparison - Abilities with importance scores over 50			
Description	Mechanical Engineering Technicians	Mechanical Engineers	Importance
Oral Comprehension	69	80	78
Written Comprehension	71	76	75
Problem Sensitivity	66	71	75
Oral Expression	69	75	72
Deductive Reasoning	71	73	72
Inductive Reasoning	66	66	72
Information Ordering	67	66	72
Near Vision	64	69	72
Flexibility of Closure	57	57	62
Visualization	64	66	62
Speech Clarity	44	48	62
Written Expression	62	69	59
Mathematical Reasoning	62	67	59
Selective Attention	44	50	59
Speech Recognition	42	51	59
Fluency of Ideas	51	62	56
Category Flexibility	59	66	56
Number Facility	44	69	56
Perceptual Speed	53	53	53
Originality	55	66	50
Memorization	50	44	50
Speed of Closure	41	55	50
Finger Dexterity	53	46	50
Far Vision	48	50	50
Skill Level Comparison - Abilities with importance scores over 69			
Description	Mechanical Engineering Technicians	Mechanical Engineers	Importance
Operations Analysis	57	76	81
Active Listening	75	81	77
Science	51	85	77
Critical Thinking	66	86	76



Systems Analysis	39	61	76
Installation	50	58	74
Social Perceptiveness	36	45	73
Active Learning	70	73	71
Monitoring	51	68	71
Writing	67	78	70

Knowledge Level Comparison - Knowledge with importance scores over 69

Description	Mechanical Engineering Technicians	Mechanical Engineers	Importance
Mechanical	75	77	74
Physics	41	49	72
Administration and Management	41	60	69

### Experience & Education Comparison

Related Work Experience Comparison			Required Education Level Comparison		
Description	Mechanical Engineering Technicians	Mechanical Engineers	Description	Mechanical Engineering Technicians	Mechanical Engineers
10+ years	10%	5%	Doctoral	0%	0%
8-10 years	1%	7%	Professional Degree	0%	0%
6-8 years	7%	16%	Post-Masters Cert	0%	0%
4-6 years	2%	8%	Master's Degree	0%	0%
2-4 years	39%	15%	Post-Bachelor Cert	0%	0%
1-2 years	10%	27%	Bachelors	43%	81%
6-12 months	0%	0%	AA or Equiv	23%	3%
3-6 months	4%	0%	Some College	0%	3%
1-3 months	11%	0%	Post-Secondary Certificate	14%	0%
0-1 month	0%	0%	High School Diploma or GED	16%	11%
None	11%	19%	No HSD or GED	0%	0%

Mechanical Engineering Technicians

Mechanical Engineers

#### Most Common Educational/Training Requirement:

Associate degree

Bachelor's degree

#### Job Zone Comparison

3 - Job Zone Three: Medium Preparation Needed

Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.

Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.

4 - Job Zone Four: Considerable Preparation Needed

A minimum of two to four years of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.

Most of these occupations require a four - year bachelor's degree, but some do not.



Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.

Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training.

### Tasks

#### Mechanical Engineering Technicians

#### Mechanical Engineers

##### Core Tasks

##### Core Tasks

##### Generalized Work Activities:

##### Generalized Work Activities:

- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
- Evaluating Information to Determine Compliance with Standards - Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.

- Making Decisions and Solving Problems - Analyzing information and evaluating results to choose the best solution and solve problems.
- Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Evaluating Information to Determine Compliance with Standards - Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.

##### Specific Tasks

##### Specific Tasks

##### Occupation Specific Tasks:

##### Occupation Specific Tasks:

- Analyze test results in relation to design or rated specifications and test objectives, and modify or adjust equipment to meet specifications.
- Calculate required capacities for equipment of proposed system to obtain specified performance and submit data to engineering personnel for approval.
- Confer with technicians and submit reports of test results to engineering department and recommend design or material changes.
- Devise, fabricate, and assemble new or modified mechanical components for products such as industrial machinery or equipment, and measuring instruments.
- Discuss changes in design, method of manufacture and assembly, and drafting techniques and procedures with staff and coordinate corrections.
- Draft detail drawing or sketch for drafting room completion or to request parts fabrication by machine, sheet or wood shops.
- Estimate cost factors including labor and material for purchased and fabricated parts and costs for assembly, testing, or installing.

- Apply engineering principles and practices to emerging fields such as robotics, waste management, and biomedical engineering.
- Assist drafters in developing the structural design of products using drafting tools or computer-assisted design (CAD) or drafting equipment and software.
- Conduct research that tests and analyzes the feasibility, design, operation and performance of equipment, components and systems.
- Confer with engineers and other personnel to implement operating procedures, resolve system malfunctions, and provide technical information.
- Design test control apparatus and equipment and develop procedures for testing products.
- Develop and test models of alternate designs and processing methods to assess feasibility, operating condition effects, possible new applications and necessity of modification.
- Develop, coordinate, and monitor all aspects of production, including selection of manufacturing methods, fabrication, and operation of product designs.



- Evaluate tool drawing designs by measuring drawing dimensions and comparing with original specifications for form and function using engineering skills.
- Inspect lines and figures for clarity and return erroneous drawings to designer for correction.
- Operate drill press, grinders, engine lathe, or other machines to modify parts tested or to fabricate experimental parts for testing.
- Prepare parts sketches and write work orders and purchase requests to be furnished by outside contractors.
- Read dials and meters to determine amperage, voltage, electrical output and input at specific operating temperature to analyze parts performance.
- Record test procedures and results, numerical and graphical data, and recommendations for changes in product or test methods.
- Review project instructions and blueprints to ascertain test specifications, procedures, and objectives, and test nature of technical problems such as redesign.
- Review project instructions and specifications to identify, modify and plan requirements fabrication, assembly and testing.
- Set up and conduct tests of complete units and components under operational conditions to investigate proposals for improving equipment performance.
- Set up prototype and test apparatus and operate test controlling equipment to observe and record prototype test results.
- Test equipment, using test devices attached to generator, voltage regulator, or other electrical parts, such as generators or spark plugs.

#### Detailed Tasks

##### Detailed Work Activities:

- analyze engineering design problems
- analyze engineering test data
- analyze technical data, designs, or preliminary specifications
- calculate engineering specifications
- communicate technical information
- conduct performance testing
- confer with engineering, technical or manufacturing personnel
- develop plans for programs or projects
- diagnose mechanical problems in machinery or equipment
- draw prototypes, plans, or maps to scale
- estimate cost for engineering projects
- evaluate engineering data
- examine engineering documents for completeness or accuracy
- fill out purchase requisitions

- Establish and coordinate the maintenance and safety procedures, service schedule, and supply of materials required to maintain machines and equipment in the prescribed condition.
- Estimate costs and submit bids for engineering, construction, or extraction projects, and prepare contract documents.
- Investigate equipment failures and difficulties to diagnose faulty operation, and to make recommendations to maintenance crew.
- Oversee installation, operation, maintenance, and repair to ensure that machines and equipment are installed and functioning according to specifications.
- Perform personnel functions such as supervision of production workers, technicians, technologists and other engineers, or design of evaluation programs.
- Provide feedback to design engineers on customer problems and needs.
- Read and interpret blueprints, technical drawings, schematics, and computer-generated reports.
- Recommend design modifications to eliminate machine or system malfunctions.
- Research and analyze customer design proposals, specifications, manuals, and other data to evaluate the feasibility, cost, and maintenance requirements of designs or applications.
- Research, design, evaluate, install, operate, and maintain mechanical products, equipment, systems and processes to meet requirements, applying knowledge of engineering principles.
- Solicit new business and provide technical customer service.
- Specify system components or direct modification of products to ensure conformance with engineering design and performance specifications.
- Study industrial processes to determine where and how application of equipment can be made.
- Write performance requirements for product development or engineering projects.

#### Detailed Tasks

##### Detailed Work Activities:

- advise clients or customers
- advise clients regarding engineering problems
- analyze engineering design problems
- analyze engineering test data
- analyze project proposal to determine feasibility, cost, or time
- analyze scientific research data or investigative findings
- analyze technical data, designs, or preliminary specifications



- follow manufacturing methods or techniques
- follow statistical process control procedures
- inspect facilities or equipment for regulatory compliance
- modify electrical or electronic equipment or products
- operate metal or plastic fabricating equipment/machinery
- operate pneumatic test equipment
- operate precision test equipment
- prepare technical reports or related documentation
- read blueprints
- read schematics
- read technical drawings
- read vehicle manufacturer's specifications
- recommend solutions to engineering problems
- record test results, test procedures, or inspection data
- set up and operate variety of machine tools
- test equipment as part of engineering projects or processes
- understand engineering data or reports
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use drafting or mechanical drawing techniques
- use electrical or electronic test devices or equipment
- use knowledge of metric system
- use precision measuring tools or equipment
- use robotics systems technology
- use scientific research methodology
- use technical information in manufacturing or industrial activities
- use technical regulations for engineering problems

#### Technology - Examples

##### Analytical or scientific software

- ANSYS Mechanical
- MSC Software Adams
- Spectral Dynamics STARAcoustics
- Spectral Dynamics STARMDal
- The Mathworks MATLAB
- Wolfram Research Mathematica

##### Computer aided design CAD software

- Autodesk AutoCAD Mechanical

- analyze test data
- bid engineering, construction or extraction projects
- calculate engineering specifications
- call on customers to solicit new business
- collect scientific or technical data
- communicate technical information
- compile numerical or statistical data
- compute production, construction, or installation specifications
- conduct performance testing
- confer with engineering, technical or manufacturing personnel
- coordinate engineering project activities
- coordinate production maintenance activities
- create mathematical or statistical diagrams or charts
- delegate authority for engineering activities
- design control systems
- design electro-mechanical equipment
- design electronic equipment
- design engineered systems
- design machines
- design manufacturing processes or methods
- design power equipment
- design tools or mechanical devices
- design transporting processes
- determine specifications
- develop mathematical simulation models
- develop or maintain databases
- develop plans for programs or projects
- develop policies, procedures, methods, or standards
- develop safety regulations
- develop tables depicting data
- diagnose mechanical problems in machinery or equipment
- direct and coordinate activities of workers or staff
- direct personnel in support of engineering activities
- draw prototypes, plans, or maps to scale
- estimate cost for engineering projects
- estimate time needed for project
- estimate time or cost for installation, repair, or construction projects
- evaluate costs of engineering projects
- evaluate engineering data
- evaluate manufacturing or processing systems
- evaluate product design
- evaluate tool designs
- examine engineering documents for completeness or accuracy



- Autodesk Inventor
- Bentley MicroStation
- Computer aided design CAD software
- IBM CATIA V5
- PTC Pro/ENGINEER software

Computer aided manufacturing CAM software

- CNC Mastercam
- Computer aided manufacturing CAM software
- Three-dimensional 3D solid modeling software

Development environment software

- Microsoft Visual Basic
- National Instruments LabVIEW

Industrial control software

- Computerized numerical control CNC programming software
- Robotic control software
- Soft Servo Systems LadderWorks PLC

Internet browser software

- Web browser software

Office suite software

- Microsoft Office

Presentation software

- Microsoft PowerPoint

Project management software

- Microsoft Project

Spreadsheet software

- Microsoft Excel

Word processing software

- Corel WordPerfect software
- Microsoft Word

Tools - Examples

- Accelerometers
- Adjustable wrenches
- Air compressors
- Clamp-on ammeters

- explain complex mathematical information
- follow manufacturing methods or techniques
- follow safe waste disposal procedures
- follow statistical process control procedures
- improve test devices or techniques in manufacturing, industrial or engineering setting
- inspect facilities or equipment for regulatory compliance
- lead teams in engineering projects
- oversee testing or construction of prototype
- plan production processes
- plan testing of engineering methods
- prepare contract documents
- prepare reports
- prepare technical reports or related documentation
- provide analytical assessment of engineering data
- read blueprints
- read schematics
- read technical drawings
- read vehicle manufacturer's specifications
- recognize characteristics of metals
- recommend materials for products
- recommend purchase, repair, or modification of equipment
- resolve engineering or science problems
- supervise production workers
- test equipment as part of engineering projects or processes
- understand engineering data or reports
- use biological research techniques
- use computer aided drafting or design software for design, drafting, modeling, or other engineering tasks
- use computer graphics design software
- use computers to enter, access or retrieve data
- use drafting or mechanical drawing techniques
- use government regulations
- use intuitive judgment for engineering analyses
- use knowledge of investigation techniques
- use library or online Internet research techniques
- use mathematical or statistical methods to identify or analyze problems
- use pollution control techniques
- use project management techniques
- use quality assurance techniques
- use quantitative research methods
- use relational database software
- use research methodology procedures



- High-voltage amplifiers
- Anemometers
- Optical microscopes
- C clamps
- Dial calipers
- Electronic comparators
- Compression testing machines
- Coordinate measuring machines CMM
- Dynamometers
- Extrusion machines
- Fatigue testers
- Mill files
- Fluid meters
- Rotameters
- Force sensors
- Plane-parallel gauge blocks
- Arc welding equipment
- Bore gauges
- Go/no-go gauges
- Safety goggles
- Digitizing tablets
- Surface grinders
- Polishing machines
- Claw hammers
- Durometers
- Vernier height gauges
- Hex keys
- Impact testers
- Heat treatment furnaces
- Injection molders
- Metallographs
- Computerized numerical control CNC lathes

- use research methodology procedures within manufacturing or commerce
- use robotics systems technology
- use scientific research methodology
- use spreadsheet software
- use technical information in manufacturing or industrial activities
- use technical regulations for engineering problems
- use total quality management practices
- use word processing or desktop publishing software
- work as a team member
- write business project or bid proposals
- write product performance requirements

Technology - Examples

Analytical or scientific software

- Accelerated life testing software
- ANSYS software
- Blue Ridge Numerics CFDdesign
- Computational fluid dynamics CFD software
- Data acquisition software
- Design of experiments DOE software
- Failure mode and effects analysis FMEA software
- Finite element method FEM software
- Grid generation software
- Life cycle cost software
- MAYA Nastran
- Mesh generation software
- Modal analysis software
- Motion analysis software
- Reliability analysis software
- Reliasoft Alta 6 Pro
- ReliaSoft BlockSim
- ReliaSoft Weibull+ + 6
- Sigmetrix CETOL 6 Sigma
- Statistical energy analysis SEA software
- Statistical software
- The Mathworks MATLAB



- Spirit levels
- Granite surface plates
- Load cells
- Locking pliers
- Long nose pliers
- Metal inert gas MIG welding equipment
- Marking gauges
- Bend test fixtures
- Programmable logic controllers PLC
- Micrometers
- Microprocessors
- Combination milling machines
- Milling machines
- Digital multimeters
- Laptop computers
- Nut drivers
- Oscilloscopes
- Personal computers
- Drafting plotters
- Positioning jigs
- Power drills
- Cylindrical grinders
- Belt sanders
- Band saws
- Pressure sensors
- Safety gloves
- Protractors
- Center punches
- Hacksaws
- Offset screwdrivers
- Scribes
- Shear testing fixtures

#### Computer aided design CAD software

- Autodesk AutoCAD software
- Computer aided design CAD software
- COSMOSWorks software
- Failure assessment software
- InnovMetric PolyWorks
- Intergraph Plant Design System PDS
- Lambda Research OSLO
- Mathsoft Mathcad
- Metrix Imageware Surfer
- Optical analysis software
- PTC Pro/ENGINEER software
- PTC Pro/ENGINEER Wildfire
- PTC Pro/Sheetmetal
- Reverse engineering software
- SolidWorks CAD software
- UGS I-DEAS
- Zeemax software

#### Computer aided manufacturing CAM software

- Computer aided manufacturing CAM software
- Rapid prototyping software

#### Data base user interface and query software

- Microsoft Access

#### Development environment software

- Hewlett-Packard HP Graphics Language HPGL
- Ladder Logic
- Microsoft Visual Basic
- MUMPS M
- National Instruments LabVIEW
- Rockwell Software

#### Financial analysis software

- Cost estimation software

#### Industrial control software

- Computer numerical control CNC software



- Power shears
- Signal conditioners
- Signal generators
- Arc-joint pliers
- Socket sets
- Soldering equipment
- Combination squares
- Steel rules
- Strain gauges
- Wire strippers
- Measuring tapes
- Dies
- Temperature sensors
- Tensile testers
- Dynamic mechanical analyzers DMA
- Snap gauges
- Screw thread gauges
- Tungsten inert gas TIG welding equipment
- Twin-screw extruders
- Twist drills
- Ultrasound inspection equipment
- Utility knives
- Vacuum molders
- Freon recovery equipment
- Vibration testers
- Spot welders
- Welding masks
- Dry rod ovens
- Wire cutters
- Drill presses

- Human machine interface HMI software

Materials requirements planning logistics and supply chain software

- Bill of materials software

Object or component oriented development software

- C++

- G-code

Presentation software

- Microsoft PowerPoint

Project management software

- Microsoft Project

Spreadsheet software

- Microsoft Excel

Video creation and editing software

- Video analysis software

Word processing software

- Microsoft Word

#### Tools - Examples

- Accelerometers
- Acoustic emission AE sensors
- Air compressors
- Fused deposition modeling machines
- Coordinate measuring machines CMM
- Dynamometers
- Servo-hydraulic material testing machines
- Optical sensors
- Subsonic wind tunnels
- Digital particle image velocimeters
- Force transducers
- Chemical-mechanical polishing equipment
- Nano indentation systems
- Heat exchangers
- Contact testers
- Infrared thermography cameras
- Cryogenic apparatus



- Interferometers
- Vibration control systems
- Computed tomography CT systems
- Programmable logic controllers PLC
- Multimeters
- Oscilloscopes
- Personal computers
- Photoelastic testing machines
- Multi-pen plotters
- Vapor deposition tube furnaces
- Position transducers
- Stylus profilometers
- Laser digitizers
- Scanning electron microscopes
- Scanning probe microscopes
- Aligners
- Function generators
- Fluorescence spectrometers
- Velocity transducers
- Steppers
- Dynamic strain indicators
- Ellipsometers
- Torsional converters
- Vibration testers
- Video editing systems
- Analog to digital converters
- Wire electrical discharge machines
- X ray radiographic systems

### Labor Market Comparison

Maine Department of Labor.

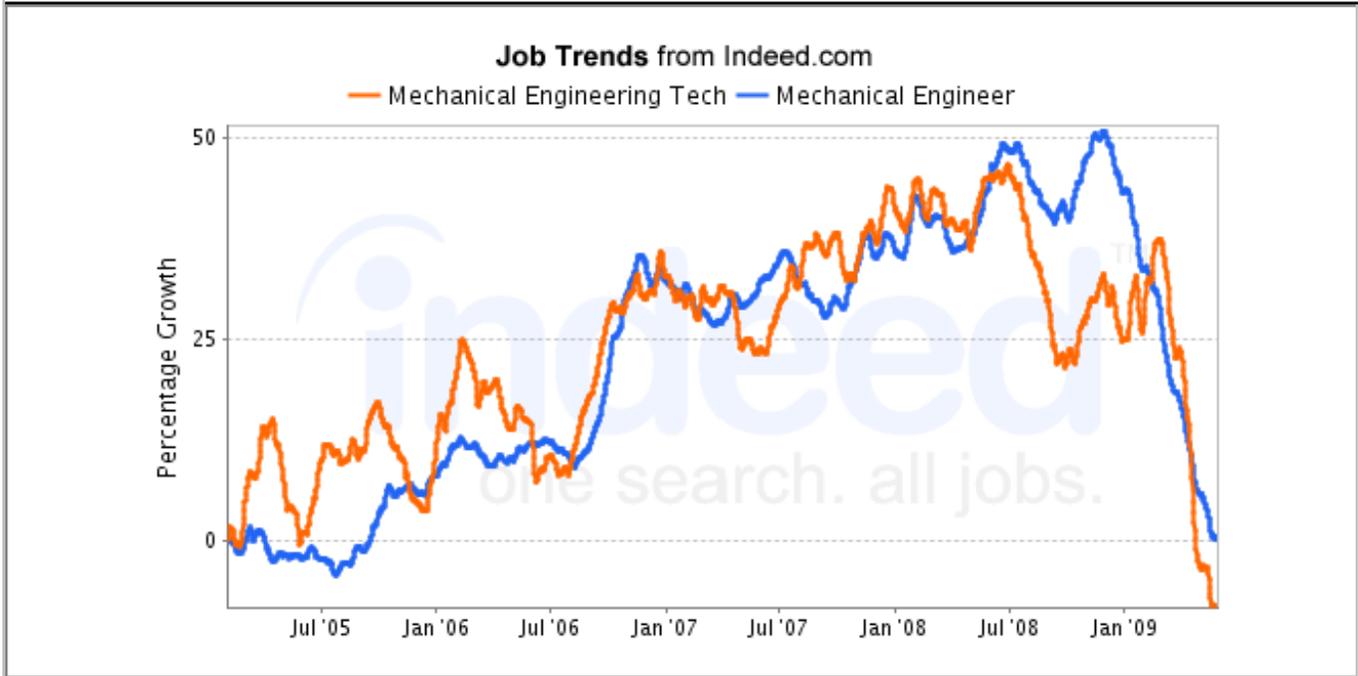
Description	Mechanical Engineering Technicians	Mechanical Engineers	Difference
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Median Wage	\$ 44,890	\$ 67,210	\$ 22,320
10th Percentile Wage	\$ 30,530	\$ 44,330	\$ 13,800
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 51,860	\$ 83,850	\$ 31,990
90th Percentile Wage	\$ 61,330	\$ 96,070	\$ 34,740
Mean Wage	\$ 45,460	\$ 68,230	\$ 22,770
Total Employment - 2105	130	620	490
Employment Base - 2006	129	631	502
Projected Employment - 2114	132	572	440
Projected Job Growth - 2006-2114	2.3 %	-9.4 %	-11.7 %
Projected Annual Openings - 2006-2114	3	14	11
Special			
Special Occupations:			

### National Job Posting Trends

Trend for Mechanical Engineering Technicians and Mechanical Engineers



Data from [Indeed](http://Indeed.com)

### Programs

Related Programs

Mechanical Engineering



Mechanical Engineering. A program that prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of physical systems used in manufacturing and end-product systems used for specific uses, including machine tools, jigs and other manufacturing equipment; stationary power units and appliances; engines; self-propelled vehicles; housings and containers; hydraulic and electric systems for controlling movement; and the integration of computers and remote control with operating systems.

Institution	Address	City	URL
University of Maine		Orono	<a href="http://www.umaine.edu/">www.umaine.edu/</a>
University of Maine		Orono	<a href="http://www.umaine.edu/">www.umaine.edu/</a>
University of Maine		Orono	<a href="http://www.umaine.edu/">www.umaine.edu/</a>
University of Maine		Orono	<a href="http://www.umaine.edu/">www.umaine.edu/</a>

### Maine Statewide Promotion Opportunities for Mechanical Engineering Technicians

O*NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings	Special
17-3027.00	Mechanical Engineering Technicians	100	3	130	\$44,890.00	\$0.00	2%	3	
17-3023.03	Electrical Engineering Technicians	91	3	430	\$45,180.00	\$290.00	-20%	9	
27-1021.00	Commercial and Industrial Designers	91	4	140	\$49,170.00	\$4,280.00	5%	5	
17-3013.00	Mechanical Drafters	89	3	710	\$46,630.00	\$1,740.00	2%	22	
17-2141.00	Mechanical Engineers	89	4	620	\$67,210.00	\$22,320.00	-9%	14	
17-2072.00	Electronics Engineers, Except Computer	88	4	210	\$76,420.00	\$31,530.00	-26%	4	
17-2112.00	Industrial Engineers	87	4	580	\$68,350.00	\$23,460.00	11%	22	
17-2131.00	Materials Engineers	87	4	40	\$70,250.00	\$25,360.00	-7%	1	
17-3026.00	Industrial Engineering Technicians	86	3	370	\$51,700.00	\$6,810.00	6%	9	★
17-2121.02	Marine Architects	86	4	60	\$75,520.00	\$30,630.00	-9%	1	
51-4111.00	Tool and Die Makers	86	3	160	\$51,670.00	\$6,780.00	-11%	2	
17-2111.03	Product Safety Engineers	85	5	90	\$49,940.00	\$5,050.00	3%	3	



17-2031.00	Biomedical Engineers	84	4	20	\$86,560.00	\$41,670.00	-10%	1
17-2071.00	Electrical Engineers	84	4	260	\$73,050.00	\$28,160.00	-10%	6
17-2121.01	Marine Engineers	84	4	60	\$75,520.00	\$30,630.00	-9%	1

Special Occupations:

### Top Industries for Mechanical Engineers

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Navigational, measuring, electromedical, and control instruments manufacturing	334500	5.42%	12,238	11,716	-4.26%
Aerospace product and parts manufacturing	336400	4.79%	10,826	11,025	1.84%
Federal government, excluding postal service	919999	4.56%	10,296	9,733	-5.47%
Motor vehicle parts manufacturing	336300	4.14%	9,339	7,435	-20.39%
Research and development in the physical, engineering, and life sciences	541710	3.83%	8,649	9,227	6.69%
Other general purpose machinery manufacturing	333900	3.40%	7,677	7,623	-0.70%
Self-employed workers, primary job	000601	2.24%	5,060	5,390	6.54%
Industrial machinery manufacturing	333200	2.20%	4,968	4,477	-9.88%
Agriculture, construction, and mining machinery manufacturing	333100	2.16%	4,872	4,549	-6.63%
Metalworking machinery manufacturing	333500	1.94%	4,374	3,581	-18.13%
Semiconductor and other electronic component manufacturing	334400	1.81%	4,083	3,569	-12.59%
Employment services	561300	1.77%	3,999	5,061	26.56%
Other fabricated metal product manufacturing	332900	1.71%	3,863	3,423	-11.39%
Plastics product manufacturing	326100	1.61%	3,643	3,862	6.00%
Management of companies and enterprises	551100	1.56%	3,526	4,065	15.28%

### Top Industries for Mechanical Engineering Technicians

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Research and development in the physical, engineering, and life sciences	541710	8.52%	4,072	4,344	6.69%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	6.30%	3,013	2,884	-4.26%
Testing laboratories	541380	5.16%	2,467	3,037	23.12%
Other general purpose machinery manufacturing	333900	5.01%	2,393	2,376	-0.70%



Semiconductor and other electronic component manufacturing	334400	3.33%	1,593	1,392	-12.59%
Aerospace product and parts manufacturing	336400	3.02%	1,442	1,468	1.84%
Agriculture, construction, and mining machinery manufacturing	333100	2.58%	1,234	1,152	-6.63%
Employment services	561300	2.19%	1,047	1,325	26.56%
Industrial machinery manufacturing	333200	2.14%	1,022	921	-9.88%
Engine, turbine, and power transmission equipment manufacturing	333600	2.05%	980	822	-16.07%
Motor vehicle parts manufacturing	336300	2.00%	957	762	-20.39%
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	333400	1.94%	926	852	-8.01%
Medical equipment and supplies manufacturing	339100	1.78%	851	870	2.29%
Communications equipment manufacturing	334200	1.74%	833	839	0.79%
Commercial and service industry machinery manufacturing	333300	1.63%	780	684	-12.28%

## Industry & Occupational Data Sources

TORQ Results: The TORQ Scores is based upon an proprietary algorithm applied against Knowledge, Skills and Ability levels and importance derived from O\*NET 12.

ASK Analysis, Experience & Education Levels and Tasks: O\*Net 12

Labor Market Comparisons Occupational Projections data from Maine Department of Labor

National Posting Trends Indeed.com

Labor Pool & Promotions Opportunities: Occupational Projections data from Maine Department of Labor

Top Industries: Occupational Employment Statistics program (U.S. Bureau of Labor Statistics)