



A Guide to Apprenticeship in Texas



Texas Workforce Investment Council
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The Mission of the Texas Workforce Investment Council

Assisting the Governor and the Legislature with strategic planning for and evaluation of the Texas workforce system to promote the development of a well-educated, highly skilled workforce for Texas.

A GUIDE TO APPRENTICESHIP IN TEXAS

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Table of Contents

Introduction.....	1
Skills Gap in Texas.....	1
Registered Apprenticeship	1
Texas Workforce Investment Council and Apprenticeship	2
Apprenticeship Legislation	2
Federal Resources and State Funding	2
Registered Apprenticeship in Texas	3
Employers and Apprenticeship Programs	4
Apprentices.....	5
Table 1: Average Wage and Increase Progression (Fiscal Year 2017)	6
Training Providers in Texas	6
Apprenticeship Occupations in Texas	7
Table 2: Top 20 Texas Apprenticeship Occupations in 2017	8
Statewide Industry Breakout of Apprenticeship Programs.....	8
Table 3: Texas Apprenticeship Programs by Industry	9
Matching Apprenticeable Occupations with Middle-Skill STEM Occupations	9
Table 4: Apprenticeable Occupations Alignment with Middle-Skill STEM Occupations	10
Concluding Comments	13

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Introduction

Skills Gap in Texas

Texas is experiencing a skills gap that is part of a labor shortage many companies are trying to overcome. According to data from the U.S. Bureau of Labor Statistics, key industries in the state are not able to find enough trained workers to fill vacant positions. The reality of baby boomers retiring has generated a demand for workers with training that requires less than a four-year degree but more than a high school diploma. Fifty-six percent of all Texas jobs in demand are middle-skill jobs, while only approximately 43 percent of the state's available workers are trained to this middle-skill level. In addition, many job seekers in the state are now competing for jobs in a global economy that demands skilled workers in STEM (science, technology, engineering, and math) related occupations. A growing number of states across the nation are turning to apprenticeships as a potential solution to their labor shortages, especially in rural areas where it is more difficult to attract new workers.

Registered Apprenticeship

Registered apprenticeship programs are training programs that produce highly skilled workers in occupations ranging from trades (carpenters, plumbers, and electricians) to STEM-related industries such as healthcare, energy, and information technology. As a type of postsecondary training that teaches industry-based skills and standards, registered apprenticeships offer a sequence of classroom instruction and on-the-job training where workers learn academic and practical aspects of an occupation. Apprentices are full-time, paid employees who earn while they learn.

In Texas, registered apprenticeship programs are typically conducted by an employer, a group of employers, or a group of employers in cooperation with labor, through a local apprenticeship training committee. The local apprenticeship training committee is an independent group that runs the registered apprenticeship program for a particular occupation. The program's training committee is approved by the U.S. Department of Labor (Office of Apprenticeship). The committee sponsors and develops instructor standards for the apprenticeship program and may interview apprentices for the program.

Texas Workforce Investment Council and Apprenticeship

In 1993, the Texas Workforce Investment Council (Council) was created by Senate Bill 642, 73rd Legislature, as a state agency serving as a Human Resource Investment Council authorized under the Federal Job Training Partnership Act Reform Amendments of 1992. The Council assumed the responsibilities formerly held by the state apprenticeship and training advisory committee. To carry out these functions, the Council created a subcommittee called the Apprenticeship and Training Advisory Committee (ATAC). ATAC is charged with providing advice and recommendations to the Council regarding the apprenticeship program in Texas. The Council is responsible for advising the governor and legislature on programs and services in the Texas workforce system.

Apprenticeship Legislation

In 1937, Congress passed the National Apprenticeship Act to regulate apprenticeship and on-the-job training programs. This legislation approved new work standards and brought together employers and labor for the establishment of apprenticeship. After the National Apprenticeship Act was implemented, apprenticeship training programs operated mainly in the manufacturing, construction, and utilities industries. After World War II, new programs diversified to provide training to emergency responders, police, firefighters, and health and safety workers. Currently, regulations allow state agencies to administer and oversee apprenticeship training programs. The Office of Apprenticeship, a branch of the U.S. Department of Labor's Employment and Training Administration, supervises and works in partnership with apprenticeship agencies in 26 states, including Texas.

Federal Resources and State Funding

Apprenticeship programs are encouraged at the federal and state level though federal funding resources and state laws. According to the Department of Labor, over \$1 billion for employment and training services is available through the Workforce Innovation and Opportunity Act. These apprenticeship programs can provide funds for on-the-job training, instruction, and support services to help apprentices.

Federal financial aid is available for those who qualify. Pell grants and federal work-study grants are available if the apprenticeship is connected to a school's program of study. In addition, G.I.

Bill¹ recipients in a registered apprenticeship program are eligible to receive a monthly stipend in addition to wages received in an apprenticeship.

The Texas legislature appropriates general revenue funds for apprenticeship programs authorized under Texas Education Code, Chapter 133. To qualify for funds, apprenticeship training programs and apprentices must be registered with the Office of Apprenticeship. As provided in the Texas Education Code, the Texas Workforce Commission allocates funds to the grantees, who are fiscal agents for Chapter 133 funds. The grantee subcontracts with the local apprenticeship training committee of each apprenticeship program to provide funds for conducting classroom instruction. The local apprenticeship programs conduct the related classroom instruction. State funds help pay a portion of the costs related to classroom instruction and expenses for instructor salaries, materials, equipment, and instructional supplies of qualified apprenticeship programs.

State funds are accessed from either the Texas Workforce Commission or the Texas Higher Education Coordinating Board. Chapter 133 of the Texas Education Code (Chapter 133) is used to help fund a portion of the required classroom instruction component of some apprenticeship programs. The Texas Higher Education Coordinating Board also provides similar funding through an agency legislative appropriations request.

Registered Apprenticeship in Texas

An employer can register with the Office of Apprenticeship or through the Texas Workforce Commission; however, for a program to become a registered apprenticeship program, the Office of Apprenticeship must ultimately approve and register it, and it must be based on an approved apprenticeable occupation. Participants (apprentices) are paid by the employer while simultaneously receiving training on the job and in a classroom setting. Upon successful completion of the registered apprenticeship program, the apprentice is employed and receives an industry-recognized credential that is portable across the nation. A registered apprentice is an individual enrolled in an Office of Apprenticeship-approved program. While there are apprenticeship programs that are not registered by the Office of Apprenticeship, those programs are not the focus in this guide.

¹The Serviceman's Readjustment Act of 1944, also known as the G.I. Bill, was a law that provided a range of benefits for returning World War II veterans.

Employers and Apprenticeship Programs

Apprenticeship programs are beneficial to employers who require and are willing to train workers in the latest skills and competencies. In order to become eligible to provide apprenticeships, employer sponsors must adhere to government rules regarding safety, wage, quality, and equal employment protections for apprentices. Individual or group employer sponsors design, organize, manage, and finance training programs under a set of locally approved apprenticeship training program standards. These standards are registered and must be kept current with the Office of Apprenticeship. Several training program standards are required, including policies, curriculum, length of training, and operating procedures.

The Office of Apprenticeship must approve any classroom-related curriculum developed by an apprenticeship program. Classroom-related instruction is characterized as an organized and systematic method designed to provide an apprentice with occupation-specific theoretical and technical knowledge. This type of instruction is conducted outside of regular work hours and typically requires a minimum number of hours each year. An apprenticeship program may last up to five years, but most are no longer than four years.

Employers who sponsor apprentices gain a skilled workforce and benefit from reduced turnover and improved quality of work overall. Apprenticeship programs can help businesses address critical or expected shortages of skilled labor, while also training future workers. Employers help integrate apprentices into the organizational culture and tend to generate long-term loyalty. Businesses can train workers for current positions, as well as plan for future retirements or business expansions.

While employers take on significant costs to sponsor apprentices, they also benefit from paying lower wages to workers during their apprenticeship program. Additionally, because of the required emphasis on safety training, employers see lower workers' compensation costs.

Apprenticeship programs can help address Texas' workforce needs, such as the gap in middle-skill occupations. Additional advantages for employers who sponsor apprentices include: aligning the skill sets of the unemployed with the types of jobs available; filling positions that require multiple or unique skills; and providing a viable solution to the growing shortage of technical skills.

Apprentices

In order to be eligible to become an apprentice in Texas, a student must meet the minimum qualifications required for age, education, and physical ability. The student must be at least 16 years old in order to work in hazardous occupations. In addition, the student must have a high school diploma or GED credential, unless otherwise specified by the minimum requirements set by the apprenticeship program. Where necessary, apprentices must be able to work in a physically demanding environment for extended periods of time and in all weather conditions. Apprentices receive on-the-job training and classroom instruction that provides the technical knowledge required to competently perform in various industries. Apprentices who have marketable skills for in-demand occupations are able to effectively compete in the labor market.

Those who complete apprenticeship programs generally earn higher wages during their working years when compared to individuals working in similar occupations who do not participate in an apprenticeship program. Wage increases occur with satisfactory progress in both classroom instruction and on-the-job training. As an example, Texas apprentices earned an average starting wage of \$13.41 an hour (FY 2017 Chapter 133 funding)². Table 1 illustrates that fourth-year apprentices earned an average wage of \$20.38 an hour, while fifth-year apprentices earned \$23.41 an hour.

² The Texas Workforce Commission is responsible for distributing state funds for the support of apprenticeship programs that meet specific criteria, as outlined in Texas Education Code, Chapter 133. Since Chapter 133 registered apprenticeship programs make up nearly 40 percent of all Texas programs, these wage data are being used as a proxy for estimating statewide apprenticeship wages.

Table 1: Average Wage and Increase Progression (Fiscal Year 2017)

Chapter 133 average wage by year of apprenticeship					
First	Second	Third	Fourth	Fifth	Overall Average
\$13.41	\$16.12	\$18.21	\$20.38	\$23.41	\$18.31
Percentage of increase from year one					
Years			Variance/Hour		Percent Increase
First to second			\$2.71		20.21%
First to third			\$4.80		35.79%
First to fourth			\$6.97		51.98%
First to fifth			\$10.00		74.57%

Source: Texas Workforce Commission, Workforce Development Division

Apprentices receive an education while incurring little or no debt. In many cases, programs may offer dual accreditation through postsecondary institutions that apply credit for program completion toward an associate's degree or college credit for future degrees. Apprenticeship programs also offer an alternative to classroom-based education. Much of the learning occurs on the job rather than in the classroom.

Apprentices receive an industry certification that is portable and valuable anywhere in the nation, ensuring that their skills are transferable to other companies and industries. The certificate, one of the oldest and most highly portable industry credentials in use today, is issued by a federally approved state apprenticeship council, or by the Office of Apprenticeship. This aligns with the Council's research³ on the middle-skill STEM occupations and industry-based certification system initiative. This research indicated that industry-based certifications should be third party assessed, industry recognized, and nationally portable.

Training Providers in Texas

Training providers partner with businesses to determine training needs, deliver training, assess participants through examination, and issue certificates upon successful completion of classroom training. Apprentices receive instruction and supplemental training that complements their on-the-job training. Instruction may offer related academic, technical, or workforce knowledge relevant to specific jobs. This instruction may be provided by a community college, technical school, apprenticeship program school, or through a specific

³ *Third Party, Industry-Based Certifications for Middle-Skilled STEM Occupations in Texas* (June 2016).

business. Providers also collaborate with businesses to develop curriculum based on skills and knowledge that apprentices will need. All partners collaborate to identify costs and funding sources related to instruction, including expenses incurred by employers.

Training components can be arranged in different ways to develop a system that works for both businesses and apprentices. The traditional apprenticeship program model allows apprentices to receive both related instruction and on-the-job training concurrently. However, programs can require apprentices to complete some related instruction (through an employer, community college, or other training institution) before starting a job in order to learn critical skills required for the first day of work. Additionally, programs can also use a segmented approach where apprentices alternate between related instruction and on-the-job training. All apprenticeship programs that are registered with the Office of Apprenticeship, or a recognized state apprenticeship agency, are automatically eligible as training providers.

Some employers provide their own training. Others receive funding through the Texas Workforce Commission through Chapter 133. Eligible grantees for Chapter 133 funding include community colleges, independent school districts, and apprenticeship committees. Additional funding is available through the Texas Higher Education Coordinating Board to utilize community colleges as training providers.

According to data from the Office of Apprenticeship, 131 providers currently operate and offer training to over 16,000 apprentices in Texas. This includes the Texas Workforce Commission's 18 registered training providers that operate 70 programs with over 6,000 apprentices (projected for fiscal year 2018) through Chapter 133 funding.

Apprenticeship Occupations in Texas

The Department of Labor's Office of Apprenticeship registers new apprenticeable occupations in Texas every year. Table 2 is a snapshot capture of this list. The occupations and the numbers of apprentices shown are fluid as new programs begin and apprentice numbers fluctuate throughout the year. Table 2 lists apprenticeship occupation titles and the number of active apprentices associated with each. The table lists the top 20 apprenticeable occupations in the state, ranked by the number of active apprentices.

Table 2: Top 20 Texas Apprenticeship Occupations in 2017

Apprenticeship Occupations	Active Apprentices
Electrician (Alternate Title: Interior Electrician)	6234
Plumber	1516
Pipe Fitter (Construction)	1330
Sheet Metal Worker	663
Structural Steel Worker (Alternate Titles: Ironworker or Structural Ironworker)	658
Elevator Constructor (Alternate Title: Elevator Constructor Mechanic)	633
Truck Driver, Heavy	546
Line Installer-Repairer	469
Millwright	401
Carpenter	288
Operating Engineer (Alternate Title: Heavy Construction Equipment Mechanic)	280
Telecommunications Technician (Alternate Title: Broadband Technician)	241
Chemical Operator III	236
Refinery Operator	215
Boilermaker II	189
Line Maintainer (Alternate Title: High Voltage Electrician)	146
Fire Fighter	124
Structural Steel/Ironworker (Existing Title: Structural Steel Worker)	112
Heating & Air-Conditioner Installer/Service	107
Sprinkler Fitter	105

Source: U.S. Department of Labor

Statewide Industry Breakout of Apprenticeship Programs

While the majority of apprenticeship programs operate within goods-producing industries such as construction and manufacturing, there are a growing number of programs in service-providing industries as well. Table 3 indicates that the largest industry for apprenticeship programs in the state is construction. Growing apprenticeship industries include service industries such as healthcare and professional, scientific, and technical services.

Table 3: Texas Apprenticeship Programs by Industry

NAICS Code	NAICS Title	No. Programs
11	Agriculture, Forestry, Fishing, and Hunting	1
21	Mining	8
22	Utilities	102
23	Construction	386
31	Manufacturing	3
32	Manufacturing	62
33	Manufacturing	68
42	Wholesale Trade	4
44	Retail Trade	2
48	Transportation and Warehousing	6
51	Information	5
52	Finance and Insurance	2
53	Real Estate Rental and Leasing	2
54	Professional, Scientific, and Technical Services	18
56	Admin. and Support and Waste Mgmt. and Remediation Svcs.	20
61	Education Services	59
62	Health Care and Social Assistance	19
72	Accommodation and Food Services	3
81	Other Services (except Public Administration)	24
92	Public Administration	248

Source: U.S. Department of Labor

Matching Apprenticeable Occupations with Middle-Skill STEM Occupations

Texas has a shortage of available workers who are trained to meet the demand of middle-skill level occupations. This report has highlighted a proven pathway for job seekers to not only gain skills through training, but to receive pay while doing so. In addition, individuals who complete the program earn a nationally portable, industry-recognized certification through the apprenticeship process, which meets the criteria for the Council's definition of an industry-based certification.

The Texas Workforce Investment Council's middle-skill STEM occupation and industry-based certification initiative will produce a list of certifications that employers across the state value

when making hiring decisions. Table 4 compares this list with the Office of Apprenticeship's list of apprenticeable occupations to show where these occupations align. This list of 81 middle-skill STEM occupations includes occupations listed in local workforce development areas' board plans, occupations with significant projected growth, and licensed and information technology occupations. Seventy of the 81 middle-skill STEM occupations were matched with Texas apprenticeable occupations registered with the U.S. Department of Labor. This clearly demonstrates that apprenticeships are a strong workforce strategy to meet middle-skill needs in the Texas labor market. And, where there is no match of an apprenticeable occupation to a middle-skill STEM occupation, there is an opportunity to implement new apprenticeship programs.

Table 4: Apprenticeable Occupations Alignment with Middle-Skill STEM Occupations

Apprenticeable Occupations	O-Net	SOC	Middle-Skill STEM Occupations
Farmer, General (Agriculture)	11-9013.02	11-9013	Farmers, Ranchers, and Other Agricultural Managers
Facility Manager	11-9141.00	11-9199	Managers, All Other
Operations Assistant (Energy)	13-1199.03	13-1199	Business Operations Specialists, All Other
Internetworking Technician	15-1143.00	15-1134	Web Developers
Computer Support Specialist	15-1151.00	15-1151	Computer User Support Specialists
Network Support Technician	15-1142.00	15-1152	Computer Network Support Specialists
Drafter, Architectural	17-3011.01	17-3011	Architectural and Civil Drafters
Drafter, Electronic	17-3012.01	17-3012	Electrical and Electronics Drafters
Drafter, Mechanical	17-3013.00	17-3013	Mechanical Drafters
Drafter	17-3012.01	17-3019	Drafters, All Other
Research Mechanic (Aircraft)	17-3021.00	17-3021	Aerospace Engineering and Operations Technicians
Engineering Assistant, Mechanic Equipment	17-3013.00	17-3022	Civil Engineering Technicians
Electrical Technician	17-3023.03	17-3023	Electrical and Electronics Engineering Technicians
Assembler, Electromechanical	17-3024.00	17-3024	Electro-Mechanical Technicians
Environmental Analyst	19-2041.00	17-3025	Environmental Engineering Technicians
Industrial Engineering Technician	17-3026.00	17-3026	Industrial Engineering Technicians
Mechanical Engineering Technician	17-3027.00	17-3027	Mechanical Engineering Technicians
Industrial Manufacturing Technician	17-3029.09	17-3029	Engineering Technicians, Except Drafters, All Other
Surveyor Assistant Instrument	17-3031.01	17-3031	Surveying and Mapping Technicians
Agricultural Service Worker	37-3012.00	19-4011	Agricultural and Food Science Technicians
Chemical Engineering Technician	19-4031.00	19-4031	Chemical Technicians
Tester (Petrol Refinery)	19-4041.02	19-4041	Geological and Petroleum Technicians

Community Health Worker	21-1091.00	19-4091	Environmental Science and Protection Technicians, Including Health
Agricultural Service Worker	37-3012.00	19-4093	Forest and Conservation Technicians
No Match		19-4099	Life, Physical, and Social Science Technicians, All Other
Recording Engineer, Sound Mixer	27-4014.00	27-4014	Sound Engineering Technicians
Radiation Monitor	19-4051.02	29-1124	Radiation Therapists
No Match		29-1126	Respiratory Therapists
No Match		29-1141	Registered Nurses
Medical-Laboratory Technician	29-2012.00	29-2012	Medical and Clinical Laboratory Technicians
No Match		29-2021	Dental Hygienists
No Match		29-2031	Cardiovascular Technologists and Technicians
No Match		29-2032	Diagnostic Medical Sonographers
No Match		29-2033	Nuclear Medicine Technologists
Diagnostic Imaging Specialty	29-2034.00	29-2034	Radiologic Technologists
Magnetic Resonance Imaging Tech	29-2034.00	29-2035	Magnetic Resonance Imaging Technologists
Emergency Medical Technician	29-2041.00	29-2041	Emergency Medical Technicians and Paramedics
No Match		29-2051	Dietetic Technicians
Pharmacy Technician	29-2052.00	29-2052	Pharmacy Technicians
Surgical Technologist	29-2055.00	29-2055	Surgical Technologists
Veterinary/Lab Animal Tech	31-9096.00	29-2056	Veterinary Technologists and Technicians
Ophthalmic Dispensing Opt/Contact Lens	29-2081.00	29-2057	Ophthalmic Medical Technicians
Nurse, Licensed Practical	29-2061.00	29-2061	Licensed Practical and Licensed Vocational Nurses
Medical Coder (Alternate Title: Patient Administration Specialist)	29-2071.00	29-2071	Medical Records and Health Information Technicians
Optician Dispensing	29-2081.00	29-2081	Opticians, Dispensing
No Match		29-2092	Hearing Aid Specialists
Health Care Sanitary Technician	29-2099.00	29-2099	Health Technologists and Technicians, All Other
Safety Inspector/Technician	29-9011.00	29-9012	Occupational Health and Safety Technicians
Laboratory Technician	19-4031.00	29-9099	Healthcare Practitioners and Technical Workers, All Other
No Match		31-2011	Occupational Therapy Assistants
Physical Therapy Aide	31-2022.00	31-2021	Physical Therapist Assistants
Dental Assistant (Alternate Title: Dental Specialist)	31-9091.00	31-9091	Dental Assistants
Medical Assistant	31-9092.00	31-9092	Medical Assistants
Cook (Alternate Title: Nutrition Care Specialist)	35-2012.00	35-1012	First-Line Supervisors of Food Preparation and Serving Workers
Farm Worker, General I	45-2091.00	45-2021	Animal Breeders
Logger, All-round	45-4021.00	45-4022	Logging Equipment Operators
Operating Engineer	47-2073.00	47-2073	Operating Engineers and Other Construction Equipment Operators
Electrician	47-2111.00	47-2111	Electricians

Hazardous-Waste Material Technician	47-4099.00	47-4041	Hazardous Materials Removal Workers
Telecommunication Tower Technician	49-2021.00	49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers
Avionics Technician	49-2094.00	49-2091	Avionics Technicians
Electronics Mechanic	49-2011.00	49-2094	Electrical and Electronics Repairers
Electrician, Radio	49-2021.00	49-2097	Electronic Home Entertainment Equipment Installers and Repairers
Aircraft Mechanic, Electrical	49-2091.00	49-3011	Aircraft Mechanics and Service Technicians
Automotive Technician Specialist	49-2011.00	49-3023	Automotive Service Technicians and Mechanics
Millwright	49-9044.00	49-9044	Millwrights
Electromedical Equip Repairer	49-9062.00	49-9062	Medical Equipment Repairers
No Match		49-9081	Wind Turbine Service Technicians
Elect-Motor & Gen Assembler	51-2031.00	51-2023	Electromechanical Equipment Assemblers
Candy Maker	51-3092.00	51-3092	Food Batchmakers
Numerical Control Machinist Operator	51-4011.00	51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic
Welder (Existing Title: Welder, Combination)	51-4121.02	51-4121	Welders, Cutters, Solderers, and Brazers
Power-Plant Operator	51-8013.00	51-8013	Power Plant Operators
Chief Operator (Chemical)	51-8091.00	51-8091	Chemical Plant and System Operators
Plant Operator, Furnace Pro	51-8091.00	51-8092	Gas Plant Operators
Chemical Operator Iii	51-9011.00	51-9011	Chemical Equipment Operators and Tenders
Dental Laboratory Technician	51-9081.00	51-9081	Dental Laboratory Technicians
Biomedical Equipment Technician	49-9062.00	51-9082	Medical Appliance Technicians
Optician (Alternate Title: Optical Laboratory Specialist)	51-9083.00	51-9083	Ophthalmic Laboratory Technicians
Logistics Engineer	17-2112.00	53-6041	Traffic Technicians
Field Tech Soil/Asphalt Inspector	47-4011.00	53-6051	Transportation Inspectors

Sources: U.S. Department of Labor and Texas Workforce Investment Council

The fact that existing Texas apprenticeable occupations align with the same middle-skill jobs in demand supports the probability of positive outcomes for both employers and apprentices. Apprenticeship is a proven model for technical training and a viable pathway for companies feeling the effects of the skills gap. Texas employers can view apprenticeship as a potential solution to address their labor shortages.

As demonstrated by the occupations in the table, apprenticeship is no longer exclusively a training model for the trades. There is new interest in expanding these programs. Companies in the U.S. employed 358,000 apprentices in 2011, and that number increased to 505,000 in

2017.⁴ Apprenticeship programs are being added for many new jobs outside the apprenticeship mainstays of construction and manufacturing. New programs have started in areas such as healthcare, cybersecurity, and banking.

Concluding Comments

Apprenticeship programs create pathways to well-paying jobs and improve worker outcomes, while helping businesses meet their demand for skilled workers. Fifty-six percent of all Texas jobs in demand are middle-skill jobs, and many job seekers are competing in a global economy that demands skilled workers in STEM-related occupations. The Council performed extensive research and compiled a list of middle-skill STEM occupations and associated industry-based certifications. These certifications were validated by Texas employers throughout the state to be of value in the hiring process. The alignment of the Council's middle-skill STEM occupations with existing registered apprenticeable occupations illustrates that apprenticeship is – at the very minimum – a viable training option for Texas employers to consider.

The apprenticeship model is a highly effective method of training and education that offers a return on investment to employers and apprentices. Apprenticeship programs connect job seekers interested in learning marketable skills using structured, on-the-job training with employers seeking highly qualified workers. This results in a workforce that is industry driven and that provides employers with a competitive edge.

⁴ J.B. Wogan, "Can Apprenticeships Train the Workforce of the future? States Hope So," http://www.governing.com/templates/gov_print_article?id=474904203 (2018).

Texas Workforce Investment Council

System Partners

Economic Development and Tourism
Texas Department of Criminal Justice
Texas Education Agency
Texas Health and Human Services Commission

Texas Higher Education Coordinating Board
Texas Juvenile Justice Department
Texas Veterans Commission
Texas Workforce Commission

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