Crediting Learning from Registered Apprenticeships

In November 2017, San Jacinto College established a steering committee to facilitate the articulation of US Department of Labor (DOL) Registered Apprenticeship certificates for college course credits. Workshops with seven community colleges and eight DOL Registered Apprenticeships were held to develop crosswalks showing the skills required to be taught, learned, and mastered by the DOL Registered Apprenticeships, using the Texas Higher Education Coordinating Board's (THECB) Workforce Education Course Manual (WECM). In January 2018, the steering committee presented these processes and crosswalks to THECB for approval. The initial workshops focused on 10 craft areas: electrical, millwright/industrial maintenance/mechatronics, plumbing, pipefitting, welding, machining, carpentry, HVAC, sheet metal, and masonry.

The crosswalks provide a more efficient and effective means for community colleges to work with DOL Registered Apprenticeships in providing college credit or continuing education units once an individual completes the apprenticeship program. The crosswalks also aid the development of memorandums of understanding between community colleges and DOL Registered Apprenticeships. It is important to note that individual college policies and procedures must still be followed, and that credit cannot be given unless the full apprenticeship is completed, because in many cases, skills are not taught in the same order or block as in the WECM courses.

This effort provides an important opportunity for apprentices to continue on a career pathway and earn an associate's or bachelor's degree, creating a skills acquisition continuum from Registered Apprenticeship to college. It also brings a new population of degree seekers to support the governor's 60x30TX goal, which aims for at least 60 percent of Texans ages 25–34 to hold a certificate or degree by 2030.

How to Use an Apprenticeship Crosswalk

For a student who has completed an apprenticeship and wants to pursue a community college certificate or degree:

- Student takes copy of certification of apprenticeship completion to a community college with which the registered apprenticeship organization has a Memorandum of Understanding or to any other community college in Texas that offer a program in which the individual has completed the apprenticeship.
- Student visits with appropriate community college personnel to determine what classes the college offers in that program for which the student can receive credit.
- College procedures and policies will dictate how many courses the student will be allowed college credit.

For Community Colleges with an apprenticeship program for which a crosswalk has been developed:

- College can use the crosswalk to develop a relationship with a registered apprenticeship program that provides their own classroom training and, subsequently, write a Memorandum of Understanding defining specifically for what courses the apprentice will receive college credit once they have completed the apprenticeship.
- College can use the crosswalk to determine for what courses an individual may get credit if an individual has completed an apprenticeship in a particular field. This does not depend on the college having an MOU with the training organization with which the individual completed the apprenticeship.

For Registered Apprenticeship Programs that provide their own classroom training:
Registered apprenticeship organizations should work with a community college to develop a pathway through their apprentices can move through an apprenticeship to the community college to earn an associate degree and, possibly, beyond.

Notes

- Crosswalks have been designed using Work Plans as approved by the Department of Labor for the specific industry sectors and cross-walked to courses in the Texas Higher Education Coordinating Board – Workforce Education Curriculum manual.
- Teams of community college faculty and industry specific subject matter experts developed the crosswalks.
- Thirty-eight individuals from 7 community colleges and 8 Department of Labor Registered Apprenticeship organizations participated.

Basic Assumptions

- The crosswalks have been designed to encourage and help colleges be more efficient and consistent in developing MOU/partnerships with DOL Registered Apprenticeships in Texas.
- The crosswalks are designed to be used when the individual requesting transferability has completed the apprenticeship.
- The crosswalks are applicable only when a community college offers those courses/program.
- The college chooses which courses, as per their program, will transfer.
- The college follows its own policies and procedures regarding transfer of credit/credit for prior learning.

CARPENTER

	Introduction to Carpentry	Introduction to the Construction Industry	Construction Methods & Materials I	Construction Methods & Materials II	Construction Tools & Techniques	Residential & Light Commercial Blueprint Reading	Concrete I	Concrete II	Field Engineering	Construction Technology I	Construction Technology II	Roof Systems	Wall Systems	Floor Systems	Forms & Foundations I	Forms & Foundations II	Exterior Finish Systems	Construction Technology III	Construction Technology IV	Fundamentals of Residential Building Science	Interior Finish Systems	Industrial Scaffolding & Rigging	Stairs	Introduction to Welding	Industrial Mathematics	Technical Calculations	Technical Trigonometry	Technical Algebra	Technical Algebra & Trigonometry	Technical Math Applications	Green Building	Commerical/Industrial Blueprint Reading	Special Topics in Construction/Buidling Technology/Technician	Basic Construction Safety
	CRPT 1029, 1329, 1429	CNBT 1001,1201, 1301	CNBT 1011,1311, 1411	CNBT 2004,2304, 2404	CNBT 1018,1318, 1418	CNBT 1000,1300, 1400	CNBT 1013,1313, 1413	CNBT 1049,1349, 1449	CNBT 1015,1315, 1415	CNBT 1016,1316, 1416	CNBT 1050,1350, 1450	CRPT 1011,1311, 1411	CRPT 1015,1315, 1415	CRPT 1023,1323, 1423	CRPT 1025,1325, 1425	CRPT 1049,1449	CRPT 1041,1341, 1441	CNBT 1053,1353, 1453	CNBT 2039,2339, 2439	RBPT 1300,1400	CRPT 1045,1345, 1445	CBFM 1021,1221, 1321	CRPT 2047,2447	WLDG 1000,1200	TECM 1001,1301, 1401	TECM 1303,1403	TECM 1017,1317	TECM 1041,1341	TECM 1343	TECM 1049	CNBT 2017,2317, 2417	CNBT 2010,2310, 2410	CNBT 1091,1191, 1291,1391, 1491	CNBT 1010,1110, 1210
Skills																																		
Math	x		x	x		x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Science	x	x	x	x			x	x	x	x	x	x					x			x				x		x					x			x
Shop	x	x	x	x	x	x	x	x		x	x				x	x	x			x		x	x	x								x		x
Drawing		x	x			x	x	x			x	x	x	x	x		x	x	x	x		x						x						x
Safety	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Basic Carpentry	x		x	x	x	x	x	x	x				x	x	x	x	x	x			x													
Use of Carpentry Tools	x		x	x	x		x	x	x	x	x		x	x	x	x	x			x	x		x											
Woodworker Machine				x	x					x	x																							
Layout & Planning	x	x	x	x	x	x	x	x	x			x	x	x	x	x	x			x	x		x								x	x		x
Construction & Installation Building			x	x		x			x	x	x	x	x	x	x	x	x	x	x				x											
Machine Footings & Forms						x	x	x		x	x				x	x		x	x															
Production Equipment										x	x							x	x															
Office Construction			x	x		x			x	x	x		x					x	x												x			
Maintenance & Repair Buildings							x	x	x	x	x							x	x												x			
Advanced Carpentry					x	x			x			x									x		x											
Special Furniture (desk, tables, etc.)					x																x		x											
Safety Instruction	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Electrical

	Basic Electricity Theory	Fundamentals of Electricity I	Fire Protection Systems	Introduction to Electrical Safety & Tools	Commercial/Industrial Blueprint Reading	National Electrical Code I	National Electrical II	Fundamentals of Electricity	Residential Wiring	Commercial Wiring	Motors & Transformers	Cooperative Education-Electrical & Power Transmission Install, General
	ELPT 1311	ELPT 1319	OSHT 1321	ELPT 1321	CNBT 2310	ELPT 1325	ELPT 2325	ELPT 1320	ELPT 1329	ELPT 1345	ELPT 2305	ELPT XX80, XX81
Skills												
Basic Electrical Mathematics	X	X				X	X	X	X	X	X	
Safety & First Aid	X	X		X				X	X	X	X	
Care & Use of Hand Tools				X								
Care & Use of Power-Operated Tools				X								
Blueprint Reading & Electrical Symbols					X				X	X		
National Electrical Code Requirements	X	X	X	X		X	X		X	X	X	
Electrical Fundamentals & Basic Theory	X	X						X	X	X	X	
Principles of Alternating Current Circuits								X			X	
Principles & Circuitry of Direct Current	X	X									X	
Portable Electric Measuring Devices	X	X		X				X	X	X	X	
Wiring Methods	X	X	X			X	X	X	X	X	X	
Low Voltage Circuits		X	X			X		X				
Appliances					X	X	X					
Interior Distribution					X	X			X	X		
Industrial & Commercial Calculations						X	X			X	X	
Motors & Generator							X	X			X	

Practical Circuit Sketching					x		x		x	x		
Transformers							x			x	x	
Illumination & Design					x	x	x		x	x		
Primary Distribution							x			x	x	
Fundamental of Electronics								x				
Medium Voltage Circuitry						x	x			x	x	

HVAC

	EPA Recovery Ceritification Program	Basic Electricity for HVAC	Air Conditioning Control Principles	Refrigeration Principles	Residential Air Conditioning	Gas & Electric Heating	Air Conditioning Troubleshooting	Air Conditioning Installation & Startup	Residential Air Conditioning Systems Design	Heat Pumps	Commercial Air Conditioning	Commercial Refrigeration	Specialized Commercial Refrigeration	Industrial Air Conditioning	Advanced HVAC for Plumbers/Pipefitters
	HART 1056, 1256, 1356	HART 1001, 1301, 1401	HART 1003, 1303, 1403	HART 1007, 1307, 1407	HART 1041, 1341, 1441	HART 1045, 1345, 1445	HART 2036, 2336, 2436	HART 2038, 2338, 2438	HART 2045, 2345, 2445	HART 2049, 2349, 2449	HART 2014, 2341, 2441	HART 2042, 2342, 2442	HART 2057, 2357, 2457	HART 2043, 2343, 2443	PFPB 2030
Skills															
Basic Safety		X		X											
Introduction to Hand Tools		X		X											
Introduction to Blueprints									X						
Introduction to HVAC				X											
Copper & Plastic Piping Practices								X							
Soldering & Brazing								X							
Basic Electricity		X													
Introduction to Cooling				X	X										
Introduction to Heating			X						X						
Air Distribution Systems									X						
Chimney,Vents & Flues								X							
Alternating Current		X													
Basic Electronics		X	X												
Electric Heating			X			X									
Introduction to Control Circuit Troubleshooting		X	X												
Equipment						X	X								
Metering Devices				X	X										
Compressors			X	X	X										
Heat Pumps										X					
Leak Detection, Evacuation, Recovery & Charging				X	X										
Planned Maintenance															
Troubleshooting Gas Heating						X	X								
Troubleshooting Electric Heating						X	X								
Troubleshooting Cooling				X	X	X	X								

Troubleshooting Heat Pumps							x			x					
Troubleshooting Accessories							x								
Troubleshooting Electronic Controls							x								
Hydronic Healting & Cooling Systems			x		x	x	x			x					
Airside Systems					x	x	x			x					
Air Properties & Balancing				x					x	x					
Advanced Blueprint Reading									x						
Indoor Air Quality					x										
Water Treatment														x	
System Start-up & Shutdown				x											
Heating & Cooling System Design									x						
Commercial & Industrial Refrigeration												x	x		

MACHINIST

	Beginning Machine Shop	Bench Work & Layout	Manufacturing Materials & Processes	Basic Machine Shop I	Basic Machine Shop II	Basic Lathe	Intermediate Lathe Operations	Advanced Machining II	Advanced Machining I	Basic Milling Operations	Intermediate Milling Operations	Grinders, Outside, Internal, Surface	Metals & Heat Treatment	Introduction to Metallurgy	Precision Tools & Measurement	Machine Tool Repair	Machine Shop Mathematics	Print Reading for Machining Trades	Basic Computer-Aided Drafting	Operation of CNC Turning Centers	Operation of CNC Machining Centers	Computerized Numerical Control Programming	Advanced CNC Machining	Fundamentals of Computerized Numerical Controlled (CNC) Machine Controls	Intermediate Machining II	Advanced Milling Operations	Advanced Lathe Operations	Advanced Computer-Aided Manufacturing (CAM)	Introduction to Computer-Aided Manufacturing	Precision Tools and Measurement
	MCHN 1300	MCHN 1332, 1332	MCHN 1019, 1319, 1419	MCHN 1038, 1238, 1438	MCHN 1041, 1341, 1441	MCHN 1008, 1208, 1408	MCHN 1058, 1358, 1458	MCHN 2045, 2345, 2445	MCHN 2041, 2341, 2441	MCHN 1013, 1313, 1413	MCHN 2002, 2302, 2402	MCHN 1035, 1335	MCHN 1005, 1305, 1405	METL 1001, 1301	MCHN 1020, 1320	MCHN 1016, 1416	MCHN 1043, 1343	MCHN 1002, 1302	DFTG 1009, 1209, 1409	MCHN 2031, 2331, 2431	MCHN 2034, 2234, 2434	MCHN 2044, 2344, 2444	MCHN 2035, 2235, 2435	MCHN 2003, 2303, 2403	MCHN 1054, 1354, 1454	MCHN 2337, 2437	MCHN 2033, 2333, 2433	MCHN 2038, 2338, 2438	MCHN 1026, 1326, 1426	MCHN 2x02
Skills																														
Basic Measurement	x																													
Basics of the Optical Comparator	x																													
Basics of the Manual Mill										x																				
Basics of the Engine Lathe						x																								
Metal Removal Process	x			x	x																									
Safety for Metal Cutting				x	x																									
What is Cutting?	x			x	x																									
Machines for Metal Cutting	x			x	x																									
Cutting Processes	x			x	x																									
Sawing Fundamentals	x			x	x																									
Cutting Variables							x		x		x																			
Cutting Fluids							x		x		x																			
Lockout/Tagout Procedures	x			x	x																									
Hand & Power Tools Safety	x			x	x																									
Metal Working Fluid Safety	x			x	x																									
Math Fundamentals																	x													
Math Fractions & Decimals																	x													
Math Units of Measurement																	x													
Basics of Tolerance																		x												
Blueprint Reading																		x												
Geometry Lines & Angles																	x													
Geometry Triangles																	x													
Shop Geometry Overview																	x													
Shop Algebra Overview																	x													
Computer Aided Engineering																			x											
Mechanics of CNC											x																			
Basics of CNC Turning Center																				x										
Basics of CNC Machining Center																					x									
CNC Coordinates																						x								
CNC Manual Operations																				x	x		x							
CNC Offsets																				x	x		x							
GE Fanuc Mill: Control Panel Overview																								x						
GE Fanuc Mill: Lathe Panel Overview																								x						
GE Fanuc Mill: Entering Offsets																					x		x	x			x			
GEFanuc Lathe: Entering Offsets																					x		x	x						
Overview of Threads						x																								
Overview Manual Mill Setup																														x
Overview Engine Lathe Setup										x																				
Benchwork & Layout Operations		x		x	x																									
Manual Mill Operations								x			x														x	x				
Holemaking on the Mill																									x					x
Threading on the Engine Lathe						x	x																		x	x				
Band Saw Blade Section	x			x	x																									
Tool Geometry	x																													
Milling Geometry								x																	x	x				x
Drill Geometry	x			x	x																									
Shop Trig Overview																	x													

Trig, Sine, Cosine & Tangent																	x													
Interpreting Blueprints	x	x		x	x																				x					
CNC Specs for Mill																					x									
CNC Specs for Lathe																				x										
CNC Controls: GE Fanuc Mill: Locating Program Zero																					x			x						
CNC Controls: GE Fanuc Lathe: Locating Program Zero																				x				x						
CNC Controls: GE Fanuc Mill: Program Execution																					x			x						
CNC Controls: GE Fanuc Lathe: Program Execution																				x				y						
CNC Controls: GE Fanuc Mill: Program Storage																					x		x							
CNC Controls: GE Fanuc Lathe: Program Storage																				x			x							
CNC Controls: GE Fanuc Mill: First Part Runs																					x		x							
CNC Controls: GE Fanuc Lathe: First Part Runs																				x			x							
Inspection Intro to GD&T 200		x																												
Inspection Intro to GD&T 205		x																												
Inspecting with Optical Comparators															x															
Hole Inspection															x															
Thread Inspection															x															
Intro to Materials	x		x																											
Metal Manufacturing	x		x																											
Metal Classification	x		x																											
Ferrous Metals & Alloys													x	x																
Nonferrous Metals & Alloys													x	x																
Cutting Tool Materials																									x					
Carbide Grade								x																	x					
Tool Holders for Turning							x																				x			
Speed & Feed Section					x			x																						
CNC Programming & CAM																												x		
CNC Part Program																						x								
CAD/CAM Overview																													x	
Create a Turning Program																				x	x									
Turning Calculations																				x		x								
Create a Milling Program																					x	x								
Milling Calculations																					x	x								
Canned Cycles																				x	x	x								
Interpreting GD&T															x			x												
Trig Sine Bar Applications															x		x													
Mechanical Properties of Metal													x	x																
Physical Properties of Metal													x	x																
Overview of Exotic Metals													x	x																
Intro to EDM	x																								x					
Troubleshooting-Identifying Problems	x																													
Troubleshooting-Taking Corrective Action	x																													
Intro to Workholding	x																													
Supporting & Locating Principles	x																													
Locating Devices	x																													
Clamping Basics	x																													
Chucks, Collets & Vises	x																													
Fixture Body Construction								x																	x					
Fixture Design Basics								x																	x					
Drill Bushing Selections																									x					

MASONRY

	Masonry I	*Masonry II*	*Masonry III*	*Masonry IV*	*Masonry V*	*Masonry VI*
	MBST 1407	MBST 1409	MBST 2407	MBST 2409	MBST 2447	MBST 2449
Skills						
Use and maintain equipment and toolsfor the craft, including trowels, levers, rulers, jointers and brick saws	x	x	x	x	x	x
Use masonry terms	x	x	x	x	x	x
Practice math necessary for the craft, including whole numbers, fractions, addition and multiplication	x	x	x	x	x	x
Learn and practice safety guidelines	x	x	x	x	x	x
Practice necessary introductory skills such as spreading mortar, completing a full head joint, hanging a line and using a level	x	x				
Build and brick a clock wall using a level	x	x				
Calculate, mix and spread mortar	x	x				
Understand how modular increments are used to build a building			x	x		

Build a lead in, both block and brick			x	x		
Understand blueprints and building plans, especially structural and architectural plans used in the craft			x	x		
Estimate materials needed based on blueprints			x	x		
Work with speed lead/story pole			x	x		
Pratice different ways to lay bricks			x	x		
Learn different types of joints			x	x		
Lay out a wall					x	x
Build projects to demonstrate mastery of masonry guidelines					x	x
Learn specifics of blueprints including use of various detailed schedules					x	x
Pratice tuck point and brick repair					x	x
Build an arch					x	x
Understand construction of fireplaces and lintels/angle iron					x	x
Understand how state and federal guidelines affect the craft	x					
Learn different façade & finishes and used reinforced mortar		x		x		
Construct piers	x					

MECHATRONICS

	Mechanical Principles in Automated Manufacturing	Pumps, Compressors & Mechanical Drives	Basic Fluid Power	Hydraulics & Pneumatics	DC Circuits	AC Circuits	DC-AC Circuits	Industrial Electronics	Programmable Logic Controllers I	Industrial Automation II	Automated Manufacturing	Programmable Logic Controllers	Motor Controls	Industrial Automation	Robotic Fundamentals	Material Handling
	MFGT 1006,1 406	INMT 2003,2 303	ELMT 1005,1 305,14 05	HYDR 1045,1 345,14 45	CETT 1003,1 303,14 03	CETT 1005,1 305,14 05	CETT 1009,1 409,15 09	ELMT 2033,2 333,24 33	ELPT 2019,2 319,24 19	MFGT 2459	MFGT 1404	RBTC 1001,1 301,14 01	IEIR 1010,1 310,14 10	INMT 1017,1 317,14 17	RBTC 1005,1 305,14 05	OSHT 1016,1 316,14 16
Skills																
Mechanical Drives	x	x	x	x							x			x	x	x
Industrial Belting	x	x	x	x							x			x	x	x
Machinery Alignment	x	x		x										x	x	
Shafts	x	x		x												
Gear Boxes	x	x												x	x	x
Bearings	x	x														
Fluid Power			x	x						x	x			x	x	
Hydraulics										x	x					
Pneumatics	x	x	x	x						x	x					
Compressors		x	x							x	x			x		x
Electrical Systems	x				x			x	x				x	x	x	x
Motorized & PLC Controls								x	x	x						
Robotics & Automation	x								x	x	x		x	x	x	x
Welding	x										x			x	x	x
Machining & CNC	x									x	x			x	x	x
Material Handling											x					x
CAD or Drafting	x									x	x					x
Air Conditioning, Refrigeration Inspection Criteria		x	x	x						x				x	x	x
Troubleshooting	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Safety	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Mechanical Print Reading	x			x	x	x	x	x		x	x	x	x	x	x	x
Hand & Power Tools	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Math	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

MILLWRIGHT

	Millwright I	*Millwright II*	*Millwright III*	*Millwright IV*	*Millwright V*	*Print Reading for Machining Trades*	*Fundamentals of Computer Numerical Controlled (CNC) Machine Controls*	*Millwright VI*	*Hydraulics & Pneumatics*	*Millwright VII*	*Millwright VIII*
	MCHN 1025, 1325, 1425	MCHN 1029, 1329, 1429	MCHN 2005, 2305, 2405	MCHN 2007, 2307, 2407	MCHN 2012, 2312, 2412	MCHN 1002, 1302	MCHN 2003, 2303, 2403	MCHN 2014, 2314	HYDR 1045, 1345, 1445	MCHN 2016, 2316	MCHN 2018, 2318
Skills											
Safety & Accident Prevention	X	X	X	X	X	X		X	X	X	X
Intro to Millwright	X	X									
Math for Trades	X	X	X	X	X	X		X	X	X	X
Blueprint & Layout		X	X	X	X	X			X	X	
Lubrication				X	X			X		X	X
Hydraulics & Pneumatics				X	X			X	X	X	X
Mechanical Drive				X	X			X	X	X	X
Conveyor			X	X	X	X			X		
Machine Align					X			X			
Pump Repair								X	X	X	X
Compressor Fan & Blower									X	X	
Turbine			X	X		X			X	X	X
Bearings					X			X	X	X	X
Welding			X	X		X					
Seals/Mechanical Seals								X	X	X	X
Gear Box								X	X	X	X
Rigging Signal					X	X			X		X
Aerial Lift	X	X	X	X	X			X	X	X	X
PITO	X	X	X	X	X			X	X	X	X
Advanced Optic Alignment				X	X	X		X		X	X

PIPEFITTER

Skills	Construction Tools & Techniques (CNBT 1018, 1318, 1418)	Welding Safety, Tools & Equipment (WLDG 1023, 1323, 1423)	Plumbing & Pipefitting Equipment (PFPB 1050, 1350, 1450)	Industrial Mathematics (TECM 1001, 1301, 1401)	Technical Mathematic Applications (TECM 1049, 1349)	Mathematics: Special Topics in Applied Mathematics, General (TECM 1091, 1191, 1291, 1391, 1491)	Applied Physics (SCIT 1318, 1418)	Hydraulics and Pneumatics (HYDR 1045, 1345, 1445)	Field Measuring, Sketching & Layout (PFPB 2349, 2449)	Pipe Fabrication & Installation I (PFPB 2007, 2307, 2407)	Piping Standards & Materials (PFPB 2008, 2308, 2408)	Intermediate Technologies for Piping Trades (PFPB 2015, 2315)	Material Handling (OSHT 1016, 1316, 1416)	OSHA Regulations-Construction Industry (OSHT 1005, 1305, 1405)	Basic Blueprint Reading for Pipefitters (PFPB 1005, 1305, 1405)	Pipefitting Fabrication & Bluepring Reading (PFPB 1043, 1343, 1443)	Intermediate Blueprint Reading for Pipefitters (PFPB 2010, 2310)	Drafting for Specific Occupations (DFTG 1013, 1313, 1413)	Technical Drawing (DFTG 1005, 1305, 1405)	Pipe Drafting (DFTG 2023, 2323, 2423)
Skills																				
Care and Use of Tools & Equipment	x	x	x						x				x							
Mathematics: Fundamentals				x							x							x	x	x
Mathematics: Trade Applications		x	x	x	x	x		x	x			x				x	x	x		x
Physics applied to trade						x	x													
Pneumatics/Hydraulics								x												
Elementary Drawing																			x	
Machine Knowledge																				
Installation & Maintenance of Piping for Air, Gas, Water and High & Low Pressure Steam: Traps, Strainers & Valves			x							x	x					x				
Installation of Additions to and Maintenance of Sanitary System, Water System (Hot & Cold), Sewer System, Heating System Installation and Repair, Wet and Dry Sprinkler System (including alarms)			x							x	x	x				x				
Installation and Maintenance of Piping and Pneumatic Controls for Heat										x		x								
Safety: Fundamentals	x	x											x	x						
Safety: Trade Safety	x	x	x										x	x		x				
Safety: OSHA Regulations		x											x	x						x
Safety: First Aid													x	x						
Fundamentals of Reading & Drawing					x	x			x		x				x	x	x	x	x	x
Plan Reading					x	x			x		x	x			x	x	x	x	x	x
Elementary Drawing						x			x								x	x	x	x
Plan Drawing									x								x	x	x	x
Plumbing Theory			x								x	x						x		x
Terminology	x	x	x		x				x		x				x		x	x	x	x
Welding Theory												x				x		x		x
Low Pressure Boiler																x				
Water Sources										x										
Chemistry Applied to Trade																				
Rigging										x			x			x				
Pipefitting		x								x		x				x				x
Management & Supervision																				

Skills	Basic Computer-Aided Drafting (DFTG 1009, 1309, 1409)	Advanced Pipe Drafting (DFTG 2045, 2345, 2445)	Advanced Technologies in Pipe Design & Drafting (DFTG 2057, 2357, 2457)	Advanced Pipefitting Standards, Specifications & Installations (PFPB 2032, 2332, 2432)	Corrosion Basics (PTRT 1009, 1309, 1409)	Introduction to Pipe Welding (WLDG 1035, 1435, 1535)	Intermediate Pipe Welding (WLDG 2006, 2406, 2506)	Advanced Pipe Welding (WLDG 2053, 2453, 2553)	Advanced Shielded Metal Arc Welding (SMAW) (WLDG 2043, 2443, 2543)	Intro to Shielded Metal Arc Welding (SMAW) (WLDG 1028, 1428, 1528)	Intro to Gas Metal Arc Welding (GMAW) (WLDG 1030, 1430, 1530)	Intro to Gas Tungsten Arc Welding (GTAW) (WLDG 1034, 1434, 1534)	Intro to Welding Metallurgy (WLDG 1037, 1337, 1437)	Orbital Tube Welding (WLDG 2050, 2350, 2450)	Testing, Adjusting & Balancing HVAC Systems (HART 2058, 2358, 2458)	Internal Corrosion Control (METL 2301, 2401)	Introduction to Corrosion (METL 1013, 1313)	Cathodic Protection (METL 2041, 2341, 2441)	Atmospeheric Corrosion Control (METL 2305, 2405)	Plumbing Codes I (PFPB 1323)
Skills																				
Care and Use of Tools & Equipment				x	x	x	x	x	x	x	x	x		x		x		x	x	
Mathematics: Fundamentals		x					x	x							x				x	
Mathematics: Trade Applications		x					x	x	x						x				x	
Physics applied to trade		x						x	x				x			x		x		
Pneumatics/Hydraulics		x													x					
Elementary Drawing															x					
Machine Knowledge		x				x	x	x	x	x	x	x		x	x					
Installation & Maintenance of Piping for Air, Gas, Water and High & Low Pressure Steam: Traps, Strainers & Valves				x											x					
Installation of Additions to and Maintenance of Sanitary System, Water System (Hot & Cold), Sewer System, Heating System Installation and Repair, Wet and Dry Sprinkler System (including alarms)				x																
Installation and Maintenance of Piping and Pneumatic Controls for Heat				x											x					
Safety: Fundamentals					x	x	x	x	x	x	x	x				x	x	x		
Safety: Trade Safety				x	x	x	x	x	x	x	x	x			x	x	x	x		
Safety: OSHA Regulations		x																x		x
Safety: First Aid																				
Fundamentals of Reading & Drawing		x					x	x							x	x		x		
Plan Reading		x		x			x	x												
Elementary Drawing		x													x	x		x		
Plan Drawing		x		x											x	x		x		
Plumbing Theory		x		x																x
Terminology		x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Welding Theory		x		x		x	x		x	x	x	x		x						
Low Pressure Boiler																				
Water Sources																				
Chemistry Applied to Trade					x											x	x	x	x	
Rigging				x																
Pipefitting		x		x				x						x						
Management & Supervision		x																		

Skills	Basic Pipefitting Skills (PFPB 1008, 1308, 1408)	Basic Construction Managament (CNBT 1009, 1309)	Construction Estimating I (CNBT 1046, 1346, 1446)	Mechanical, Plumbing & Electrical Systems in Construction I (CNBT 1002, 1302, 1402)	Mechanical, Plumbing & Electrical Systems in Construction II (CNBT 2040, 2340, 2440)	Advanced HVAC for Plumbers/Pipefitters (PFPB 2030)	Advanced Technolohies & SpecializED Applications for Piping Trades (PFPB 2031)	First Aid (EMSP 1026)	Mechanical Drafting for Plumbing/Pipefitting (PFPB 1035)	Industrial Drafting Applications for Plumbing/Pipefitting (PFPB 2034)	Welding Layout (WLDG 1055)	Mechanics of Plumbing (PFPB 1025)	Basic Plumbing Skills (PFPB 1003)	Pipefitting: Installing of Boilers (PFPB 1041)	Basic Pipefitting: Installation & Rigging (PFPB 1001)	Corrosion Prevention (PTRT 2020)	Plumbing Codes II (PFPB 2057)	Pipefitting for Process Technicians (PFPB 1038)	Workplace Safety (OSHT 1003)
Skills																			
Care and Use of Tools & Equipment	x	x		x									x					x	
Mathematics: Fundamentals	x		x									x	x	x	x			x	
Mathematics: Trade Applications	x		x			x			x	x		x	x	x	x			x	
Physics applied to trade										x		x							
Pneumatics/Hydraulics					x	x	x		x	x		x					x		
Elementary Drawing																			
Machine Knowledge				x	x	x												x	
Installation & Maintenance of Piping for Air, Gas, Water and High & Low Pressure Steam: Traps, Strainers & Valves	x			x	x	x	x						x	x	x		x	x	
Installation of Additions to and Maintenance of Sanitary System, Water System (Hot & Cold), Sewer System, Heating System Installation and Repair, Wet and Dry Sprinkler System (including alarms)				x	x							x	x				x		
Installation and Maintenance of Piping and Pneumatic Controls for Heat					x	x				x		x		x			x		
Safety: Fundamentals	x	x											x	x					
Safety: Trade Safety	x					x	x		x	x			x	x				x	
Safety: OSHA Regulations							x		x	x				x			x		x
Safety: First Aid								x											x
Fundamentals of Reading & Drawing		x	x		x				x	x	x				x				
Plan Reading		x	x		x	x					x				x		x		
Elementary Drawing					x				x	x									
Plan Drawing					x				x	x									
Plumbing Theory				x	x		x		x	x		x	x						
Terminology	x	x	x	x	x							x	x		x	x			x
Welding Theory							x		x	x	x							x	
Low Pressure Boiler																	x		
Water Sources																	x		
Chemistry Applied to Trade												x				x			
Rigging														x	x			x	
Pipefitting							x			x	x			x	x			x	
Management & Supervision		x																	

PLUMBER

	Basic Blueprint Reading for Pipefitters	Basic Blueprint Reading for Plumbers	Basic Pipefitting Skills	Introduction to the Plumbing Trade	Plumbing Maintenance & Repair	Plumbing Codes I	Pipefitting Fabrication & Blueprint Reading	Backflow Prevention	Plumbing & Pipefitting Equipment and Safety	Pipe Fabrication & Installation I	Piping Standards & Materials	Residential Construction Plumbing I	Intermediate Blueprint Reading for Pipefitters	Commercial Construction & Fixture Setting	Pipe Fabrication & Installation II	Residential Construction Plumbing II
	PFPB 1005, 1305, 1405	PFPB 1006, 1306	PFPB 1008, 1308, 1408	PFPB 1013, 1413	PFPB 1021, 1321, 1421	PFPB 1023, 1323	PFPB 1043, 1343, 1443	PFPB 1047, 1247, 1347	PFPB 1050, 1350, 1450	PFPB 2007, 2307, 2407	PFPB 2008, 2308, 2409	PFPB 2009, 2309, 2409	PFPB 2010, 2310	PFPB 2036, 2336, 2436	PFPB 2041, 2341, 2441	PFPB 2041, 2341, 2441
Skills																
Introduction to the Plumbing Profession				X												
Plumbing Safety-OSHA Training				X					X							
Introduction to Plumbing Math			X	X			X								X	
Introduction to Tools			X	X					X							
Intro to Blueprints & Plumbing Drawings	X	X	X	X			X				X		X			
Various Pipes & Fittings			X	X						X	X	X		X	X	X
Fixtures & Faucets				X								X		X		X
Intro to Drain, Waste & Vent (DWV) Systems			X	X	X						X	X		X		
Intro Water Distribution Systems											X	X		X		
Private Water Supply Systems												X				X
Private Waste Disposal Systems												X				X
Intermediate Math			X	X			X								X	
Reading Commerical Drawings	X	X					X				X		X	X		
Installing and Testing DWV Piping					X		X		X	X	X	X		X	X	
Installing Roof, Floor & Area Drains									X					X		X
Types of Valves				X				X		X	X			X		X
Installing and Testing Water Supply Piping							X	X	X	X		X		X		X
Installing Fixtures, Vales and Faucets							X	X	X	X				X		X
Installing Water Heaters									X			X				X
Fuel & Gas Piping/Fuel Gas Systems							X					X		X		X
Intro to Fuel Gas Code						X										
Applied Math			X	X			X								X	X

Types of Venting					X							X		X		
Indirect and Special Waste														X		
Sewage and Sump Pumps														X		
Intro to Water Pipe Sizing			X									X			X	
Backflow & Prevention								X								
Water Pressure Booster & Recirculation Systems					X										X	
Servicing Piping Systems, Fixtures & Appliances					X		X							X		X
Water Pump Theory and Service					X											
International Plumbing Code						X						X		X		
IPC	X	X				X				X	X	X		X	X	X
Client Customer Relations				X	X					X		X		X		
On-the-Job Learning			X	X	X	X	X	X	X	X	X	X	X	X	X	X
Care and Use of Tools, Equipment and Material for Plumbing and Heating			X	X			X	X	X		X			X	X	
Preparation of Tools, Equipment and Material for Plumbing and Heating			X	X			X	X			X	X	X			
Drainage Piping and Fittings			X	X	X	X				X	X	X		X		
Venting					X	X				X		X		X		
Single Fixture Installations, Setting Fixtures			X		X					X		X		X	X	X
Pipecutting, Reaming, Threading & Flanging			X				X	X	X	X		X		X	X	
Install & Maintain Steam and Hot Water Heating Systems														X		X
Hot and Cold Water Distribution Systems	X	X	X							X	X	X	X	X		X
High & Low Pressure Boilers			X				X	X						X	X	
Water Heater Installation												X		X		X
Water Pumps						X								X	X	
Code Review and Plumbing Math Review			X			X	X				X		X		X	
Sizing DWV and Storm Systems			X	X								X		X	X	
Locating Buried Sewer and Water Lines												X				
Water Supply Treatment														X		
Hot Tubs																X
Corrosive-Resistant Waste Piping															X	
Plumbing for Mobile Home Parks												X				X

SHEET METAL

| | Industrial Mathematics (ECM 1004, 1005, 1406, 1416) | Machine Shop Mathematics (MCAR 1543, 1610) | Technical Math (BUSY 1540, 1548) | Technical Algebra (ECM 1541, 1546) | Technical Algebra & Trigonometry (ECM 1543) | Descriptive Geometry (EFTG 2117, 2127, 2417) | Geometric Dimensioning & Tolerancing (EFTG 2535, 2450) | Geometrical Optics (CUT 1147, 1148) | Technical Trigonometry (ECM 1542, 1547) | Technical Calculations (ECM 1403) | Sheet Metal Fabrication I (AMPP 2599, 2599, 2499) | Introduction to Layout & Fabrication (MUSC 1010, 1117) | Intermediate Layout & Fabrication (MUSC 1015, 1403) | Advanced Technologies in Mechanical Design & Drafting (MUSC 2535, 2536, 2538, 2539) | HVAC Duct Fabrication (HWT 1320, 1330, 1450) | Welding Safety, Tools & Equipment (MUSC 1121, 1123) | Construction Management III (CMT 1546, 1546, 1546) | HVAC Ship Practices & Tools (HWT 1310, 1310, 1410) | HVAC Zone Controls (HWT 2320, 2320, 2420) | Testing, Adjusting, & Balancing HVAC Systems (HWT 2299, 2299, 2399) | Basic HVAC for Plumbing/Pipefitting (PPM 1107, 1107) | Basic Electricity for HVAC (HWT 1326, 1426) | Codes, Specifications & Contract Documents (MCR 1542) | Blueprint Reading & Sketching (EFTG 1526, 1526, 1426) | Introduction to Blueprint Reading for Welders (MUSC 1111, 1112, 1412) | Air Conditioning Installation & Startup (HWT 2339, 2339, 2439) | Technical Drafting (EFTG 1526, 1526, 1426) | Technical Illustration & Presentation (EFTG 2112, 2112, 2412) | Basic Construction Safety (CMT 1110, 1110, 1110) | Construction Site Safety & Health (CMT 1107, 1107, 1107) | Leadership (BMET 2509, 2509) | Construction Management I (CMT 2542, 2542, 2542) | Construction Management II (CMT 2544, 2544, 2544) | Introduction to Welding (MUSG 1100, 1100) | Fundamentals of Gas Metal Arc Welding (GMAW) (MUSC 1132, 1132) | Advanced Shielded Metal Arc Welding (SMAW) (MUSC 2541, 2541, 2541) | Advanced Gas Metal Arc Welding (GMAW) (MUSC 2542, 2542, 2542) | Advanced Gas Tungsten Arc Welding (GTAW) (MUSC 2551, 2551, 2551) | Fundamentals of Oxy-Fuel Welding & Cutting (MUSC 1004, 1004, 1004) | Fundamentals of Gas Tungsten Arc Welding (GTAW) (MUSC 1006, 1006, 1006) | Introduction to Welding Using Multiple Processes (MUSC 1007, 1007, 1007) | Welding Safety, Tools & Equipment (MUSC 1121, 1123, 1123) | Orbital Tube Welding (MUSC 2500, 2500, 2400) | Building Codes & Inspections (CMT 1542, 1542, 1542) | Green Building (BMET 2117, 2117, 2117) | OSHA Regulations: Construction Safety (CSHT 1506, 1506, 1406) | Industrial Air Conditioning (HWT 2414, 2414, 2414) | Craning Principles (CSTE 1111, 1111, 1111) | Geometric Tolerancing (EFTG 2539) | Sheet Metal Fabrication II (AMPP 2509) | Occupational Math (ECM 1013) | Advanced Project Management (BMET 2030) | Blueprint Reading for Specific Occupations (EFTG 1033) | Technical Writing II (ETWP 2140) | Workplace Safety (CSHT 1503) | Introduction to Project Management (BMET 2101) | Shielded Metal Arc Welding (MUSC 1003) |
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WELDING

	Introduction to Welding WLDG 1000, 1200	Fundamentals of Gas Metal Arc Welding (GMAW) WLDG 1002, 1202	Shielded Metal Arc Welding (SMAW) WLDG 1003	Fundamentals of Oxy-Fuel Welding & Cutting WLDG 1004, 1204	Fundamentals of Tungsten Metal Arc Welding WLDG 1006, 1206	Introduction to Welding Using Multiple Processes WLDG 1007, 1307, 1407	Introduction to Flux Cored Arc Welding (FCAW) WLDG 1012, 1312, 1412	Introduction to Blueprint Reading for Welders WLDG 1013, 1313, 1413	Introduction to Layout & Fabrication WLDG 1017, 1317, 1417	Welding Fundamentals WLDG 1021, 1421, 1521	Welding Safety, Tools & Equipment WLDG 1022, 1323, 1423	Introduction to Oxy-Fuel Welding & Cutting WLDG 1025, 1425, 1525	Welding Codes & Standards WLDG 1027, 1327, 1427	Introduction to Shielded Metal Arc Welding (SMAW) WLDG 1028, 1328, 1528	Introduction to Gas Metal Arc Welding WLDG 1030, 1430, 1530	Introduction to Gas Tungsten Arc Welding (GTAW) WLDG 1034, 1434, 1534	Introduction to Pipe Welding WLDG 1035, 1435, 1535	Introduction to Welding Metallurgy WLDG 1037, 1337, 1437	Intermediate Layout & Fabrication WLDG 1053, 1353, 1453	Intermediate Shielded Metal Arc Welding (SMAW) WLDG 1057, 1457, 1557	Intermediate Pipe Welding WLDG 2006, 2406, 2506	Intermediate Welding Using Multiple Processes WLDG 2013, 2413, 2513	Advanced Blueprint Interpretation & Cost Analysis WLDG 2331, 2431	Welding Automation WLDG 2032, 2232, 2432	Advanced Layout & Fabrication WLDG 2035, 2235, 2535	Advanced Oxy-Fuel Welding & Cutting WLDG 2039, 2239, 2539	Advanced Shielded Metal Arc Welding (SMAW) WLDG 2043, 2243, 2543	Advanced Gas Metal Arc Welding (GMAW) WLDG 2047, 2247, 2557	Advanced Gas Tungsten Arc Welding (GTAW) WLDG 2051, 2451, 2551	Advanced Flux Cored Arc Welding WLDG 2052, 2352, 2452	Advanced Pipe Welding WLDG 2053, 2453, 2553
Skills																														
Introduction to Construction Math	x	x	x	x	x	x	x		x	x	x	x		x	x	x	x			x	x	x				x	x	x	x	x	x
Introduction to Hand Tools	x	x	x		x				x	x			x						x	x			x		x	x					
Introduction to Power Tools	x			x		x	x		x	x	x	x		x			x									x					
Introduction to Blueprints	x	x	x	x	x	x	x		x	x	x	x		x			x									x					
Basic Rigging	x	x	x		x			x	x	x			x						x			x	x		x	x	x	x	x	x	x
Welding Safety										x	x										x	x			x	x	x	x	x	x	x
Oxyfuel Cutting	x	x	x	x	x	x	x		x	x	x	x		x	x	x	x			x	x	x		x	x	x	x	x	x	x	x
Base Metal Preparation	x	x	x	x	x	x	x		x	x		x					x			x	x	x				x					x
Weld Quality	x	x	x	x	x	x	x		x	x		x	x	x	x	x	x	x		x	x	x		x	x	x	x	x	x	x	x
SMAW-Equipment & Setup	x	x	x	x	x	x	x		x		x	x	x	x	x	x	x			x	x	x		x		x	x	x	x	x	x
SMAW-Electrodes & Selection	x		x			x				x				x			x	x		x	x	x			x		x				x
SMAW-Beads & Fillet Welds	x		x			x				x				x			x			x	x	x			x		x				x
SMAW-Groove Welds with Backing	x		x			x				x				x						x	x	x					x				x
Joint Fit-Up & Alignment			x			x				x				x						x	x	x					x				x
SMAW-Open V-Groove Welds	x	x	x	x	x	x	x		x			x		x			x			x	x	x				x	x				x
SMAW-Open-Root Pipe Welds			x			x								x						x	x	x					x				x
Welding Symbols																	x				x										x
Reading Welding Detail Drawings	x	x	x		x		x	x	x	x			x		x				x	x	x	x	x		x	x	x	x			x
Stainless Steel Groove Welds	x	x	x		x		x	x	x				x		x				x	x	x	x	x		x	x	x	x			x
Air Carbon Arc Cutting & Gouging					x											x						x							x		
Plasma Arc Cutting				x	x	x			x			x				x						x				x				x	
GMAW & FCAW-Equipment & Filler Metals						x			x													x		x				x	x	x	
GMAW & FCAW-Plate		x				x	x		x						x			x				x			x			x		x	
GTAW-Equipment & Filler Metals		x				x	x		x						x							x						x		x	
GTAW-Aluminum Plate					x	x										x		x				x			x				x		

Boilermaker

	Shop Safety and Procedures	Boiler Maintenance	Boiler Operations	Introduction to Burner and Boiler Controls	Boilers-Operations, Installation and Maintenance	Water Distribution	Logistics	Testing and Inspections Systems	Workplace Safety	Pipefitting Advanced Fabrication and Installation	Advanced Hydraulics	Fuel Systems	Basic Fluid Power	Measurement and Process Control Theory	Industrial Mathematics	Precision Tools and Measurement	Commercial/Industrial Blueprint Reading	Introduction to Technical Writing	Applied General Chemistry	Mechnical, Plumbing and Electrical Systems in Construction II	Applied Physics	Introduction to Environmental Science	Basic Waterworks Operation	Pipefitting for Process Technicians	Occupational Safety and Health Act
	DEMR 1001, 1301, 1401	CBFM 1003, 1303	CBFM 1007, 1307, 1407	INTC 1020	SEST 1041, 1441	EPTC 2020	INMT 1036, 1336, 1446	QCTC 1046, 1346	OSHT 1003	PFPB 2033, 2333	HYDR 2459	DEMR 1013, 1313, 1413	ELMT 1005, 1305, 1405	INCR 1342, 1442	TECM 1001, 1301, 1401	MCHN 1020, 1320	CNBT 2010, 2310, 2410	ETWR 1002, 1302	SCIT 1014, 1314, 1414	CNBT 2040, 2340, 2440	SCIT 1318, 1418	EPTC 1011, 1211, 1311	EPTC 1027, 1327	PFPB 1030, 1238, 1338	OSHT 1005, 1305, 1405
Skills																									
Safety Equipment Usage	x	x	x	x	x				x																
Safety Techniques and Practices	x	x	x	x	x				x																
Steam Generation	x		x		x					x															
Preparing Boiler	x		x		x																				
Boiler Lighting Off	x				x																				
Boiler Load Operation	x		x		x					x															
Boiler Shutdown	x		x		x																				
Operating and Maintenance of High Pressure Steam Drain	x	x			x					x															
Maintenance of Fuel Oil System from Supply System	x	x			x						x														
Maintenance of Burner Air Supply System	x	x			x																				
Operation, Inspection & Test	x		x		x			x																	
Operation and Maintenance of Atomizer and Sprayer Plates	x	x	x		x																				
Receiving Fuel Oil from Vendor	x	x			x		x				x														
Operation and Maintenance of Boiler Fuel System	x		x		x						x														
Operation and Maintenance of Feed Water System	x		x		x	x																			
Pump Operations	x				x	x																			
Feedwater Flow Control	x		x		x	x				x			x												
Treatment and Problem Solving of Water and Impurities	x		x		x	x																			
Controller Measuring Elements	x				x																				
Control System Operation	x		x		x							x	x												
Emergency Shutdowns	x		x		x																				
Situations Not Requiring Emergency Shutdown	x			x	x																				

Maintenance of Interlocks, Automatic Devices and Alarms	x	x			x					x															
Operation, Inspection and Maintenance	x		x	x	x			x						x											
Operation, Inspection and Maintenance of Steam Turbines	x		x	x	x	x		x						x						x					
Operation, Inspection, Calibration and Maintenance of Instruments	x	x	x		x			x						x		x				x					
Safety Precautions	x								x																
Practical Applications	x	x	x	x	x	x	x	x	x	x	x	x	x	x											
Prelubricated and Sealed Units	x			x	x			x		x	x			x											
Inspections								x																	
Installations	x			x	x					x															
Practical Arithmetic															x										
Basic Algebra															x										
Plane Geometry															x										
Trigonometry															x										
Blueprint Reading																	x								
Elementary Architectural Drawing																	x								
Drawing and Sketching																	x								
Specification Writing																		x							
Trade Chemistry																			x						
Planning a Heating System																				x					
Physics																					x				
Ecology																						x	x		
Water Treatment						x					x											x	x		
Hot Water Piping Systems			x			x				x	x													x	
Types of Pipes and Fittings										x														x	
Valves, Regulators & Fittings		x			x					x			x	x											
Occupational Safety and Health Act	x								x																x

Concrete Workers

	Basic Concrete Work (Archived)	Concrete 1 (archived)	Concrete Residential	Concrete I	Concrete II	Concrete - Commercial and Industrial	Field Engineering I	Residential & Light Commercial Blueprint Reading	Basic Construction Safety	Contrucction Methods & Materails (Archived)	Construction Technology 1	Commercial/Industrial Blueprint Reading	Constriction Tools and Techniques	Introduction to Carpentry
	MBST 1001	CNBT 1013	CNBT 1313	CNBT 1413	CNBT 1049, 1349	CNBT 1449	CNBT 1015, 1315, 1415	CNBT 1000, 1300, 1400	CNBT 1010, 1110, 1210	CNBT 1011, 1211, 1311, 1411	CNBT 1016, 1316, 1416, 1516	CNBT 2010, 2310, 2410	CNBT 1018, 1318, 1418	CRPT 1029, 1329, 1429
Skills														
Safety and Good Work Habits	X	X	X	X	X	X			X	X	X		X	X
Learning to Set Screeds and Layout Work		X	X	X	X	X	X			X	X	X		X
Learning Proper Mix and Consistency	X	X	X	X						X				X
Pouring and Tamping Concrete					X	X				X				
Using Vibrating Machine		X	X	X	X	X				X	X		X	
Rough Finishing, Hand or Machine; Floating	X	X	X	X	X	X							X	
Floating hand Troweling to Smooth Finish	X	X	X	X	X	X							X	
Patching, Hand Rubbing	X	X	X	X	X	X				X			X	
Marking and Edging					X	X						X	X	
Protecting Newly Poured and Laid Concrete from Weather, Rain, Sun, Wind		X	X	X	X	X				X				
Basic Safety	X	X	X	X	X	X	X		X	X	X		X	X
Introduction to Construction Math	X	X	X	X	X	X	X	X				X		X
Introduction to Hand Tools	X	X	X	X			X		X		X	X	X	X
Introduction to Power Tools	X	X	X	X					X		X		X	X
Introduction to Blueprints	X	X	X	X	X	X	X	X		X	X	X		X

Basic Rigging		x	x	x	x	x			x	x	x		x	x
Introduction to Concrete Construction and Finishing	x				x	x	x	x				x		x
Properties of Concrete	x									x				
Preparing for Placement		x	x	x	x	x			x	x	x			
Placing Concrete		x	x	x	x	x				x	x			
Finishing: Part 1		x	x	x	x	x		x						
Curing and Protecting Concrete					x	x								
Introduction to Troubleshooting	x	x	x	x			x							x
Properties of Concrete: Part Two					x	x								
Estimating Concrete Quantities							x				x	x		x
Forming		x	x	x	x	x				x	x	x		
Site Concrete			x	x	x	x		x		x	x	x		
Architectural Finishes	x	x	x	x	x	x		x		x		x		
Industrial Floors		x	x	x	x	x		x		x		x		
Super Flat Floors					x	x	x			x	x	x		
Surface Treatments	x							x		x	x	x		x
Quality Control	x	x	x	x	x	x	x	x		x	x	x		x
Making Repairs							x			x				x

Diesel	Introduction to Shop Safety and Tools	Shop Safety and Procedures	Basic Electrical Systems	Diesel Engine I	Diesel Engine Testing and Repair I	Fuel Systems	Fundamentals of Brake Systems	Basic Hydraulics	Basic Brake Systems	Power Train I	HVAC Troubleshooting	Small Air Colled Engines	Tractor Trailer Service & Repair	Preventative Maintenance	Steering and Suspension I & II	Automatic Power Shift and Hyrostatic Transmissions I & II	Hydraulics/Fluid Exam Prepa
	DEMR 1000,	DEMR 1001,1301, 1401	DEMR 1105, 1305,1405	DEMR 1006, 1306, 1406	DEMR 1010, 1310, 1410	DEMR 1013, 1313, 1413	DEMR 1015,	DEMR 1016, 1316, 1416	DEMR 1017, 1317, 1417	DEMR 1021, 1321, 1421	DEMR 1023, 1323,1423	DEMR 1025, 1225	DEMR 1027, 1327, 1427	DEMR 1029, 1229, 1329,	DEMR 1030, 1230, 1330, 1240	DEMR 1035, 1335, 1435	DEMR 1039
Skills																	
OSHA Safety/ Shop Safety	X	X															
Basic Engine Repair				X	X												
Diesel Compression I					X												
Fuel and Ignition Systems						X											
Diesel Compression II				X	X												
Valves System				X	X												
Basic Electricity			X														
Heating, Cooling and Air Conditioning											X						
Charging and Starting Systems																	
State Inspection																	
Engine				X	X												
Fuel Systems				X	X	X											
Ignition				X	X												
Diesel Engines Overhaul				X	X												
Cooling Systems										X							
Preventative Maintenance														X			
* = TECM 1X01 TO 1X49 or higher OR MATH 1314 or higher																	
RED FONT = NO CROSSWALK TO APPRENTICESHIP																	

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Elevator Operators

	Industrial Electronics	Introduction to Direct Current Circuits	Electric Motors	Electrical Work Safety Management for Safety Professionals	Industrial Equipment Maintenance	Industrial Equipment Maintenance	Basic Blueprint Reading	Basic Hydraulics	Basic Fluid Power I (Hydraulics)	Hydraulics Fabrication and Repair	Introduction to Shop Safety and Tools	Basic Electrical Systems	Basic Electrical Theory	Industrial Wiring	AC/DC Drives	Assembly and Rigging	Industrial Scaffolding and Rigging	Buidling Maintenance I	Mechanical Maintenance	Electrical Motors Operation and Maintenance
	ELMT 2033, 2233, 2433	IEIR 1x02	IEIR 1x06	IEIR 1040	IEIR 1x43	IEIR 1x14	DFTG 1x22	HYDR 1x05	HYDR 1x09	HYDR 1x50	DEMR 1x00	DEMR 1x05	ELPT 1x11	ELPT 1x57	ELPT 2x31	AERM 2x33	CBFM 1x21	CBFM 1x11	CBFM 2x17	ELTN 1046
Skills																				
Elevator History and Basic Safety											x									
Basic Print Reading							x													
Handling Material and Tools											x									
Rigging and Hoisting																x	x			
Pit Equipment																				
Guide Rails																				
Machine Room Equipment																				
Hoistway Equipment																				
General Maintenance Procedures																		x		
Maintenance of Traction Elevators								x											x	
Maintenance of Hydraulic Elevators					x			x											x	
Maintenance of Escalators and Moving Walks								x											x	
Electrical				x								x	x							
Motor Control and Fault Finding																				x
Hydraulic and Installation									x											
Basic Electronics and Solid State	x																			
Machinery Troubleshooting/Repair	x									x										
Electrical Theory			x			x														
AC & DC Motors, Generators and Motor Control		x				x									x					
Elevator Related Circuits and Basic Circuit Analysis	x																			
Construction Wiring and Equipment														x						

Glazers & Painters

	O+B1:X1sha Regulations Construction Industry	introduction to industrial painting	Basic Interior Finishing	Industrial Scaffolding & Rigging	Interior & Exterior & Refinishing	Surface Preparation	Lead Based Paint Removal	Building Maintence I	Residential & Light Commercial Blueprint Reading	Basic Construction Safety	Commercial/Industrial Blueprint Reading	Construction Technology IV	Exterior Maintence	Exterior Finish Systems	Interior Finish Systems	Lead Inspection	CPR-Adult	CPR - Pediatric	First Aid	Wall Systems	Building Codes & Construction	Diversity in the Workplace	Building Maintence Management	Facilities Management	Craning Principles	Material Handling Equipment	Maintence Welding	Welding Safety Tools & Equipment	Welding codes & Standards	Building Remodeling	Construction Methods & Materials
	OSHT 1005	CBFM 1035	CBFM 1012	CBFM 1021	CBFM 1034	CBFM 1045	EPCT 1045	CBFM 1311	CNBT 1300	CNBT 1001	CBNT 2310	CNBT 2339	CBFM 1315	CRPT 1341	CRPT 1345	EPCT 1021	EMSP 1020	EMSP 1021	EMSP 1026	CRPT 1315	FIRT 1329	HRPO 1008	CBFM 2213	BMGT 1406	CNSE 1311	CNSE 1000	WLDG 1015	WLDG 1326	WLDG 1327	CNBT 1004	CNBT 1311
Skills																															
Trade Orientation		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X
OSHA 10-hour	X	X				X	X	X	X	X																					
CPR/First Aid/AED							X										X	X	X												
Construction Fall Protection	X	X		X	X			X		X			X	X	X					X				X	X			X	X	X	
Safety Data Sheets		X		X	X	X	X	X		X			X	X	X	X				X	X		X	X	X		X	X	X	X	X
Standards and Codes			X		X	X	X	X	X	X	X	X	X	X	X	X				X	X		X	X	X		X	X	X	X	X
Print Reading			X	X	X			X	X		X	X	X	X	X	X				X	X		X	X	X		X	X	X	X	X
Green Awareness			X	X	X	X	X	X		X			X	X	X	X				X	X		X	X	X					X	
Diversity Training																						X	X	X							
Material Recognition		X	X		X	X	X	X	X	X	X	X	X	X	X	X				X	X		X	X		X		X	X	X	X
Basic Metal Framing			X		X			X	X			X	X	X	X					X			X	X				X	X	X	X
Doors and Windows			X		X			X	X		X	X	X	X	X					X				X				X	X	X	X
Sealants		X				X	X	X				X	X	X	X	X				X	X			X						X	
Thermal Barriers		X	X		X	X		X				X	X	X						X	X		X	X				X	X	X	X
Glass Handling Safety								X		X			X	X	X								X	X	X					X	X
Glass Cutting								X					X	X	X						X			X							X
Store Front								X	X		X	X	X	X	X					X	X		X	X		X				X	X
Curtain Wall				X				X	X		X	X	X	X	X					X	X		X	X	X	X		X	X	X	X
Door and Door Frames			X		X			X	X		X	X	X	X	X					X			X	X		X				X	X
Exit and Electrical Security								X	X		X	X	X	X	X					X			X	X						X	X
Integrated Photovoltaic						X																									
Custom and Art Glazing																															
Fabrication Skills			X		X	X		X			X	X	X	X	X					X	X		X	X	X	X		X	X	X	X
Insulation			X					X	X		X		X	X	X	X				X	X		X	X						X	
UBC Rigging and Signaler Qualification Certificate				X																				X	X			X	X		
Transit Level/Laser			X		X			X				X	X	X						X	X		X	X				X	X	X	X
Powered Industrial Truck Operator Qualification				X																						X					
Aerial Lift Qualification				X				X					X	X						X	X		X	X		X		X	X	X	X
Light Gage Welding								X					X	X						X	X		X	X			X	X	X	X	
Structural Welding								X					X	X						X	X		X	X			X	X	X	X	
Supervisory Training																						X	X	X							

Advanced Print Reading			x	x				x	x		x	x	x	x	x	x				x	x		x	x				x	x	x	x
Ergonomics		x	x	x	x	x	x	x		x		x	x	x	x	x				x	x		x	x	x	x	x	x	x	x	x

Heavy Equipment Operators

	Heavy Equipment Operators	Tracks and Undercarriages	Natural Gas Compression	ST in Heavy Equipment Maintenance & Repairer	Introduction to Shop Safety	Basic Driving Skills	Basic Electrical	Diesel Engine I	Diesel Engine Testing Repair	Fuel Systems	Power Train I	Heating, Ventilation, and Air Conditioning	Preventative Maintenance	Power Train Application I	Power Train II	Electronic Controls	Power Train Application	Special Topics in Diesel Engine Maintenance and Repairer	Material Handling Equipment	Job Site Layout & Development	Forklift Operator Certification	Earth Moving Equipment Operation	Professional Truck Driver I	Professional Truck Driver II	Introduction to Welding Using Multiple Processes	Maintenance Welding	Welding Safety, Tools, and Equipment
		HEMR 1x01	HEMR 1x04	HEMR 1x91	DEMR 1x01	DEMR 1x03	DEMR 1405	DEMR 1x06	DEMR 1x10	DEMR 1x13	DEMR 1X21	DEMR 1x23	DEMR 1X29	DEMR 1x42	DEMR 1x47	DEMR 2332	DEMR 2445	DEMR 1x91	CNSE 1x10	CNSE 1x21	CNSE 1x03	CNSE 1x41	CVOP 1x13	CVOP 1x40	WLDG 1x07	WLDG 1x15	WLDG 1x23
Skills																											
Construction Machinery (Bulldozers, Power Shovels, Graders, Scrapers, Pay Rollers)																					x						
Construction Machinery Equipment (Wenches, Arches Angle, Straight Dozer Blades, Cabs, Hydraulic System)			x							x			x	x		x					x						
Running Gear (Track Chains, Track Rollers, Front Idlers, Top Idlers, Pads, Wheels)																					x						
Power Train Assemblies (for Accessories)						x	x			x			x	x		x											
Gas and Diesel Engines				x		x	x	x	x																		
Troubleshooting				x		x	x	x	x	x			x	x		x											
Carburetor Repairing		x	x	x																							
Graders																					x						
Scarpers, self-propelled																					x						
Compaction Equipment																					x						
Tractor-Type Skip Loaders/Hi-Lifts																		x		x	x						
Wheel-Type Tractors, including Forklifts, Lumber Carriers, etc.																		x		x	x						
Grade Stakes																					x						
Trenching Machines																					x						

Bulldozer																					x					
Scrapers, Towed																					x					
Misc. Equipment																		x		x	x					
Asphalt and Concrete Paver																					x					
Special Paving Equipment																					x					
Maintenance - Cutting and Burning, Grease and Oils				x					x	x		x	x	x		x								x	x	x	x
Safety		x	x	x		x			x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
Commercial Drivers License Preparation			x		x					x			x	x		x						x	x				
Hazmat		x	x	x					x			x															
Fuels and Lubricants		x	x	x			x	x	x	x		x	x	x		x											
Health			x	x			x	x	x	x		x	x	x		x								x	x	x	x
Basic Equipment Skills																			x								

Ironworkers

	Industrial Scaffolding and Rigging	Craning Principles	Forklift Operator Certification	Introduction to Welding	Fundamentals of Gas Metal Arc Welding (GMAW)	Shielded Metal Arc Welding	ntroduction to Oxy-Fuel Welding and Cutting	Introduction to Welding Using Multiple Processes	Introduction to Flux Cored Arc Welding (FCAW)	Introduction to Blueprint Reading for Welders	Introduction to Layout and Fabrication	Welding Fundamentals	Welding Safety, Tools, and Equipment	Introduction to Oxy-Fuel We	Welding Codes and Standards	Introduction to Shielded Metal Arc Welding (SMAW)	Introduction to Gas Metal Arc Welding (GMAW)
	CBFM 1021, 1221, 1321, 1421	CNSE 1011, 1311, 1411	CNSE 1003	WLDG 1000, 1200	WLDG 1002, 1202	WLDG 1003	WLDG 1025, 1425, 1407	WLDG 1007, 1307, 1407	WLDG 1012, 1312, 1412	WLDG 1013, 1313, 1413	WLDG 1017, 1317, 1417, 1517	WLDG 1021, 1421, 1521	WLDG 1023, 1323, 1423	WLDG 1025, 1425, 1525	WLDG 1027, 1327, 1427	WLDG 1028, 1428, 1528	WLDG 1030, 1430, 1530
Skills																	
Ornamental	X	X		X		X		X				X	X		X	X	X
Reinforcing		X	X	X		X	X	X				X	X	X	X	X	
Structural	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X
Welding				X	X	X	X	X	X	X	X	X	X	X	X	X	X
Structural Steel	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Safety	X	X	X	X			X	X	X	X	X	X	X	X		X	X
Blueprint Reading										X	X						
Fabrication				X	X	X	X		X	X			X	X	X	X	X
Rebar		X	X	X			X					X	X	X	X	X	
Post Tensioning		X	X				X							X			
Rigging		X	X														
Crane operating		X															
Scaffolding	X																
Forklift			X														

	Introduction to Pipe Welding	Introduction to Welding Metallurgy	Intermediate Arc Welding	Pipe Welding	ADVANCED SMAW	ADVANCED GMAW	ADVANCED FCAW	Commercial and Industrial Blueprint Reading	Commercial and Industrial Blueprint Reading	Commercial/Industrial Blueprint Reading	Architectural Blueprint Reat	Construction Tools and Techniques	Safety and Ergonomics	OSHA Regulations - Construction Industry	Construction Site Safety and Health	Material Handling	OSHA Regulations - General Industry	Structural Steel Detailing
	WLDG 1035, 1435, 1535	WLDG 1037, 1337, 1437	WLDG 1057, 1457, 1557	WLDG 2053, 2453, 2553	WLDG 2043, 2443, 2543	WLDG 2047, 2447, 2557	WLDG 2052, 2352, 2452	CNBT 1206	CNBT 1007, 1207, 1307, 1407	CNBT 2010, 2310, 2410	DFTG 1015, 1215, 1315	CNBT 2018, 2318, 2418	ENTC 1047, 1347, 1447, 1547	OSHT 1005, 1305, 1405, 1505	OSHT 1007, 1207, 1307	OSHT 1016, 1316, 1416	OSHT 2001, 2401, 2501	ARCE 1015, 1315, 1415
		X	X		X	X		X	X	X	X	X	X	X	X	X		
		X	X		X			X	X	X	X	X	X	X	X	X		
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
	X		X	X	X	X	X				X	X	X	X	X	X	X	
								X	X	X	X							X
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
		X	X		X			X	X	X	X	X	X	X	X	X		
								X	X	X	X	X	X	X	X	X		
												X	X	X	X			
														X	X			
												X	X	X	X		X	
													X	X	X		X	