

Appendix A

INTERNATIONAL UNION OF PAINTERS AND ALLIED TRADES FINISHING TRADES INSTITUTE (IUPAT/FTI)

Programs of Study

Core Curriculum

Program Competencies

IUPAT/FTI Core Curriculum Program of Study

The Core Curriculum program of the IUPAT/Finishing Trades Institute is designed to provide a foundation on which apprentices in multiple crafts will be exposed to a uniform body of theoretical knowledge and practical skills needed to be a successful crafts person in the finishing trades.

While participating in the core curriculum program of study, apprentices will be exposed to On-the-Job Learning (OJL) and Related Instruction (RI) in the following disciplines:

- 1.0 Introduction to the Union and Construction Trades
- 2.0 Health and Safety in the Construction Trades
- 3.0 Leadership and Professional Development

Apprentices will be assessed on their acquisition of knowledge, skills and abilities in the core curriculum through hands-on and written tests as well as On-the-Job Learning (OJL) performance measures.

Additionally, the apprentices will integrate their Core knowledge, skills and abilities into the pursuit of specific occupational training throughout the term of their apprenticeship. This program specific training is designed to build the technical and professional skills needed by the apprentice to successfully perform his/her occupation.

The occupations represented in the Finishing Trades Apprenticeship Program are:

- 5.0 Drywall Finisher
- 6.0 Floor Coverer
- 7.0 Glazier
- 8.0 Hydro Blaster/Vacuum Technician
- 9.0 Painter-Decorator

Core Curriculum Program Competencies

Apprentices successfully completing an apprenticeship program will be proficient in the following competencies identified in the Core Curriculum:

1.0 Introduction to the Union and Finishing Trades

- Analyze the IUPAT's role in the labor movement from 1887 to the Present.
- Identify the organizational responsibilities of the IUPAT to its members.
- Demonstrate the individual's responsibilities as an IUPAT member.
- Recognize the structure of the IUPAT at the International, District Council, and Local Union levels.
- Display good character and ethical behavior in all matters personal and professional.
- Demonstrate effective skills and knowledge using computers and related technology and applications.
- Utilize trade-related tools and equipment.
- Interpret drawings related to the finishing trades.
- Apply trade math calculations on the job.
- Demonstrate sustainable/green building design awareness on all construction sites and in all trade practices.

2.0 Health and Safety

- Recognize and apply the fundamentals of worker and jobsite safety (OSHA) on the construction site.
- Perform the proper application of First Aid, CPR, and AED on the job.
- Display healthy ergonomic practices in the workplace and on the construction site.
- Demonstrate awareness and lead-safe work practices on the jobsite.

3.0 Leadership and Professional Development

- Clearly and appropriately express ideas and other information through good oral, listening and writing skills to all levels of personnel.
- Demonstrate creativity, integrity and other influential qualities and characteristics necessary to successfully lead as a foreman, project manager or jobsite supervisor.
- Execute planning and organizational skills necessary to successfully complete a job on time and on budget.
- Recognize and apply emerging technologies in the occupation in order to elevate the industry.

Suggested Program of Study for the Core Curriculum Competencies

The IUPAT/FTI Program of Study for the Core Competencies OJL and Related Instruction is outlined below. Under this hybrid approach an apprentice must participate in the indicated minimum number of hours of OJL for each category of the program. The Program Sponsor is responsible for determining the number of RTI hours that an apprentice must participate in based on the FTI guidance, local needs, and the mandated minimum of 144 hours per year (29 CFR 29.5(b)(4)).

CATEGORY #	CATEGORY NAME	OJL HOURS	RI HOURS
1.1	History of IUPAT		4
1.2	Survival of the Fittest	16	2
1.3	Green Building Awareness		4
1.4	Sexual Harassment		2
1.5	Math for the Construction Trades		12
1.6	Basic Computing		4
1.7	Architectural Drawings/Blueprint Reading		16
2.1	Introduction to Health and Safety	16	10
2.2	First Aid/CPR/AED		8
2.3	Ergonomics		4
2.4	Respiratory Protection		4
2.5	Lead Abatement Awareness for the Lead Worker		8
2.6	Hand and Power Tool Safety Awareness		6
3.1	Communication Skills		4
3.2	Foreman Training		2
3.3	Project Management		4
3.4	Supervisor Training Program (STP)		2
		32	96

Core Curriculum Course Competencies

This table identifies the Core curriculum course competencies which the apprentices will successfully complete during their apprenticeship.

Module 1.0 – Introduction to the Union and Construction Trades

1.0	INTRODUCTION TO THE UNION AND CONSTRUCTION TRADES	
1.1	HISTORY OF IUPAT (LABOR HISTORY)	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 4 hours
	<ul style="list-style-type: none"> This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> Identify the historical reasons for unionization. Describe the strengths and weaknesses of the labor movement in the U.S. Describe the union structure and its activities. Explain how unions promote the trade and serve its members Understand the union’s impact on economic issues, corporation, productivity, and distribution of wealth. Identify and explain the most significant labor laws of the 1900s. Analyze the impact the labor movement has had on social and political reform. Evaluate the IUPAT’s role in the labor movement from 1887 to the Present.
1.2	SURVIVAL OF THE FITTEST (SOF)	
	On-the-Job Learning (OJL) – 16 hours	Related Instruction (RI) – 2 hours
	<ul style="list-style-type: none"> Demonstrate the characteristics of a craft professional. Participate in union-related activities. 	<ul style="list-style-type: none"> Investigate the current state of the union’s market share. Discuss the personal rewards and consequences associated with the union’s market share. Describe successful strategies for unions to regain a market share in the construction industry. Identify and describe what the union provides on an ongoing basis to its members and affiliates. Identify the roles and responsibilities of the end users, contractors, union, and rank and file. Articulate the value that the union provides its members and affiliates. Describe the impact the IUPAT’s Top Workplace Performance (TWP) program has on shaping attitudes and performance. Discuss the generational changes in rank and file attitudes and behaviors.
1.3	GREEN BUILDING AWARENESS	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 4 hours
	<ul style="list-style-type: none"> This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> Describe sustainability and the social, environmental, and economic impact. Identify the benefits of sustainability. Explain the purpose of sustainability in commercial and residential buildings. Identify professional ‘green’ organizations. Identify elements of sustainability. Explain the importance of green practices.

		<ul style="list-style-type: none"> • Define green bid specifications. • Identify and interpret a green specification in a project manual. • Source and cost out green products. • Create a bid incorporating green products and practices. • Describe the elements involved with sustainable sites. • Describe water efficiency practices. • Determine energy and atmospheric requirements. • Identify and describe effective materials and resources. • Discuss indoor environmental quality standards. • Discuss the 'green' innovation and design process. • Identify and discuss the LEED-NC Process.
1.4	SEXUAL HARASSMENT	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 2 hours
	<ul style="list-style-type: none"> • This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> • Define sexual harassment. • Identify the law sexual harassment violates. • Identify characteristics of quid pro quo sexual harassment. • Identify characteristics of hostile environment sexual harassment. • Cite factors that contribute to the determination of whether behavior is sexual harassment. • Explain legal and other consequences of sexual harassment. • Identify effects of sexual harassment. • Identify costs associated with sexual harassment. • Discuss employer liability in harassment cases. • Identify United States' Supreme Court Landmark Cases.
1.5	MATH FOR CONSTRUCTION TRADES	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 12 hours
	<ul style="list-style-type: none"> • This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> • Add, subtract, multiply, and divide whole numbers, with and without a calculator. • Use a standard ruler, a metric ruler, and a measuring tape to measure. • Add, subtract, multiply, and divide fractions. • Add, subtract, multiply, and divide decimals, with and without a calculator. • Convert decimals to percentages and percentages to decimals. • Convert fractions to decimals and decimals to fractions. • Explain what the metric system is and how it is important in the construction trade. • Recognize and use metric units of length, weight, volume, and temperature. • Recognize some of the basic shapes used in the construction industry and apply basic geometry to measure them.
1.6	BASIC COMPUTING	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 4 hours

	<ul style="list-style-type: none"> This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> Describe the components of a computer system. Define microcomputer hardware in terms of its functions: input, output, processing, and storage. Describe how peripheral devices are connected to a microcomputer. Identify types of software and their functions and describe the difference between system software and application software. Navigate and use the Windows XP environment to open and use applications, manage documents, and identify and maintain resources. Access and navigate the World Wide Web to find information. Create, format, and edit documents using Microsoft® Word. Create, revise, and enhance business presentations using Microsoft® PowerPoint. Create, revise, and enhance spreadsheets using Microsoft® Excel.
1.7	ARCHITECTURAL DRAWINGS/BLUEPRINT READING	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 16 hours
	<ul style="list-style-type: none"> Locate trade information using blueprints Answer basic construction questions related to the layout and installation of materials at the jobsite. 	<ul style="list-style-type: none"> Define blueprint and blueprint reading. Define plans and specifications. Describe how plans and specifications are prepared. Describe the purpose and importance of a set of plans. Identify and define various parts of a set of plans. Identify the various views of a drawing that are included in a set of plans and their relationship to each other. Identify and define material symbols, abbreviations, and lines used in drawings. Define the meaning of scale. Use fractional rule to calculate measurements. Explain how an architect's scale is used to measure lines. Use the architect's scale to determine the actual length of a scaled line. Recognize, locate, and determine missing dimensions. Describe proper handling procedures for plans and drawings.

Module 2.0 – Health and Safety

2.0	HEALTH AND SAFETY	
2.1	INTRODUCTION TO HEALTH AND SAFETY	
	On-the-Job Learning (OJL) – 16 hours	Related Instruction (RI) – 10 hours
	<ul style="list-style-type: none"> • Inspect PPE to determine if it is safe to use (PPE should include safety goggles, hard hat, gloves, safety harness, and safety shoes). • Properly don and doff PPE (safety goggles, hard hat, and personal fall protection). • Demonstrate safe lifting procedures. • Set up an extension ladder properly. • Demonstrate three-point contact on a ladder. 	<ul style="list-style-type: none"> • Explain the idea of a safety culture and its importance in the construction crafts. • Identify causes of accidents and the impact of accident costs. • Explain the role of OSHA in job-site safety. • Locate OSHA Standards references applicable to specific hazardous conditions and practices. • Recognize the aspects of 1926 Subpart C (General Safety and Health Provisions). • State the purpose of the OSHA Act and list the functions of OSHA. • List the OSHA inspection priorities and describe the inspection process. • Describe the rights and responsibilities of employers and employees under the OSHA Act. • Recognize hazard recognition and risk assessment techniques. • Explain fall protection, ladder, stair, and scaffold procedures and requirements. • Identify struck-by hazards and demonstrate safe working procedures and requirements. • Identify caught-in-between hazards and demonstrate safe working procedures and requirements. • Define safe work procedures to use around electrical hazards. • Demonstrate the use and care of appropriate personal protective equipment (PPE). • Explain the importance of hazard communications (Haz Com) and Material Safety Data Sheets (MSDSs). • Identify other construction hazards on your job site, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires.
2.2	FIRST AID/CPR/AED	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 8 hours
	<ul style="list-style-type: none"> • This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> • Demonstrate how to minimize the risk of disease transmission when giving care. • Demonstrate how to check an unconscious person for life-threatening and non-life threatening conditions. • Demonstrate how to give cardiopulmonary resuscitation (CPR) to a person.

		<ul style="list-style-type: none"> • Demonstrate how to care for a person who is not breathing and/or choking. • Describe when and how to use an AED.
2.3	ERGONOMICS	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 4 hours
	<ul style="list-style-type: none"> • This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> • Describe ergonomics and its importance in the workplace. • Describe the benefits of implementing an ergonomic program. • Identify and describe ergonomic related injuries and related musculoskeletal disorders that can occur in an office setting. • Identify and describe ergonomic related injuries and related musculoskeletal disorders that can occur in a construction workplace. • Recognize and describe risk factors that can cause musculoskeletal disorders or related injuries. • Describe healthy ergonomics in an office setting. • Describe healthy ergonomics in a construction workplace. • Demonstrate proper stretching techniques. • Identify employee and employer rights and responsibilities.
2.4	RESPIRATORY PROTECTION	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 4 hours
	<ul style="list-style-type: none"> • This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> • Describe how the respiratory system works. • Identify the different types of respirators and their purposes. • Demonstrate the proper fit, inspection, cleaning, disinfection, and storage of respirators. • Summarize how the human respiratory system works. • Identify respiratory hazards and describe how they affect the respiratory system. • Identify work activities that can create airborne hazards. • Demonstrate how to perform proper negative and positive fit-checks. • Demonstrate proper inspection of respirators. • Demonstrate safe cleaning, disinfection, and storage procedures for respirators.
2.5	LEAD ABATEMENT AWARENESS (WORKER)	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 8 hours
	<ul style="list-style-type: none"> • This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> • Explain his/her roles and responsibilities as a Lead Abatement worker. • Recall and describe basics facts in the history of lead and lead abatement. • Identify and describe the health effects of lead exposure and protection against lead exposure and poisoning. • Describe and demonstrate safe work practices when working with or around lead.

		<ul style="list-style-type: none"> • Describe general work safety and health hazards. • Identify and describe the federal, state and local regulations for lead workers. • Explain and demonstrate the pre-abatement set-up and containment procedures for residential buildings. • Recognize and describe residential lead-based paint hazards and control factors. • Describe and explain interior dust abatement procedures, clean-up and final clearance inspections. • Describe and explain the procedures for soil and exterior dust abatement with waste disposal. • Explain and demonstrate the pre-abatement set-up and containment procedures for industrial buildings. • Recognize and describe industrial lead-based paint hazards and control factors. • Describe and demonstrate lead safe work practices in compliance with the EPA Renovation, Repair, and Painting (RRP) Rule, and HUD's Lead Safe Housing Rule.
2.6	HAND & POWER TOOL SAFETY AWARENESS	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 6 hours
	<ul style="list-style-type: none"> • This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> • Recognize and identify some of the basic hand tools and their proper uses in the construction trade. • Visually inspect hand tools to determine if they are safe to use. • Safely use hand tools. • Identify power tools commonly used in the construction trades. • Demonstrate and describe all general safety rules for power tools and follow them. • Explain the importance of using guards during the operation of power tools. • Explain the importance of using a properly rated extension cord. • Demonstrate and describe how to properly <i>ground</i> a power tool. • Explain how to maintain power tools properly.

Module 3.0 – Leadership and Professional Development

3.0	LEADERSHIP AND PROFESSIONAL DEVELOPMENT	
3.1	COMMUNICATION SKILLS	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 4 hours
	<ul style="list-style-type: none"> This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> Interpret information and instructions presented in both verbal and written form. Communicate effectively in on-the-job situations using verbal and written skills. Communicate effectively on the job using electronic communication devices.
3.2	FOREMAN TRAINING	
	On-the-Job Learning (OJL)	Related Instruction (R – 2 hours)
	<ul style="list-style-type: none"> This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> Describe the role of the foreman. State the key role of the foreman in maintaining safety rules and regulations. Describe how to establish and maintain good relationships with co-workers, supervisors and other trades. Describe productive motivational techniques. Explain the importance of properly performing personnel functions in accordance with the union agreement and company policies. Explain the importance of developing and using effective communications skills. Describe the proper planning and organizational skills needed to successfully complete a job. Describe the “leadership” qualities needed to be an effective foreman.
3.3	PROJECT MANAGEMENT	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 4 hours
	<ul style="list-style-type: none"> This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> Achieve predicted and desired results in the execution of projects through implementation of consistent methodologies. Advance the skill level and knowledge of IUPAT Project Managers. Emphasize the depth and breadth of roles and responsibilities that a Project Manager may be relied upon to manage, to contribute to, or to perform.
3.4	SUPERVISOR TRAINING PROGRAM (STP)	
	On-the-Job Learning (OJL)	Related Instruction (RI) – 2 hours
	<ul style="list-style-type: none"> This is a classroom-based module, there is no OJL assessment. 	<ul style="list-style-type: none"> Define the role of the supervisor. Define the scope and importance of verbal communication. Refine written communication skills. Describe various job site personnel issues. Identify the supervisor’s role in safety. Manage and estimate the cost of tools and materials. Describe the importance of leadership in effective supervision.

IUPAT/FTI

Drywall Finisher (Taper)

Program Competencies

O*NET-SOC CODE: 47-2082.00

RAPIDS CODE: 0561HY

WORK PROCESS SCHEDULE
RELATED INSTRUCTION OUTLINE
Drywall Finisher (Taper)
O*NET-SOC CODE: 47-2082.00 RAPIDS CODE: 0561HY

IUPAT/FTI Drywall Finisher Course Competencies

The Program level curriculum builds upon the foundation of the core curriculum skills, knowledge, and abilities. At the program level, occupation-specific standardized curriculum is designed by an ad-hoc committee comprised of the FTI Curriculum Department, IUPAT/FTI subject matter experts, employers, manufacturers, and associations.

Apprentices will be assessed on their acquisition of knowledge, skills and abilities in the core curriculum through hands-on and written tests as well as on-the-job learning (OJL) performance measures.

Additionally, the apprentices will integrate their core knowledge, skills and abilities into the pursuit of specific occupation training throughout the term of their apprenticeship. This program specific training is designed to build the technical and professional skills needed by the apprentice to successfully perform his/her trade profession.

Drywall Finisher Apprenticeship Program

The Drywall Finisher Apprenticeship Program is co-sponsored by the IUPAT/FTI to meet the ever-changing needs of the industry and the affiliates it serves. The apprenticeship program ensures that apprentices will learn the theoretical knowledge and the practical skills necessary to be a successful Drywall Finisher. During this program of study, apprentices will successfully complete the IUPAT/FTI core curriculum and integrate it into the Drywall Finisher occupation specific training. Apprentices successfully completing this program apply their skills and abilities as Drywall Finisher.

Description of Occupation

Drywall Finisher - In today's workplace, drywall finishers are called upon to complete a variety of tasks and to work in a variety of situations. As new products are developed and new techniques emerge, the apprentices must adapt their skills and develop their knowledge of tools, materials and techniques to complete more challenging tasks within shorter time frames. A Drywall apprentice may work as either an Installer or a Taper or both. Installers may also be called Applicators as their job is to fasten drywall panels to the inside framework of residential houses and other buildings. Tapers, or Finishers, prepare the panels for painting by taping and finishing the joints and imperfections in the drywall surface. A Drywall Decorator will provide a decorative finish to the installed and prepared drywall panels.

Drywall consists of a thin layer of gypsum between two layers of heavy paper. It is both faster and cheaper to install than plaster and is, therefore, widely used today in most buildings on both ceilings and walls.

As a Drywall apprentice, you can expect to do the following jobs:

- Measure, cut, and install materials
- Tape joints and touch up nail holes, scrapes, and other imperfections
- Install corner guards, conceal openings around pipes
- Perform mathematical calculations and read blueprints
- Estimate the cost of installing and finishing drywall
- Provide decorative wall coverings to finished drywall panels

A Drywall Finisher must measure, cut and fit drywall panels around mechanical structures. Once the required fittings are made, the drywall panels are attached to the wood or metal framework using glue, nails or screws. One or more Drywall Finisher apprentices will work together to lift the heavy and cumbersome drywall panels into position to secure them to the framework. Oftentimes, a Drywall Finisher will use a lifting device when placing drywall panels on a ceiling. Drywall panels come in standard sizes such as 4 feet by 8 feet, or 12 feet.

Once the drywall has been securely installed, Tapers fill the joints between panels with a joint compound. Using the wide, flat edge of a hand held trowel, Tapers spread the compound into and along each side of all joints and angles with brush-like strokes. Immediately after spreading the compound, a paper tape is pressed into the wet compound to reinforce the drywall and to smooth away excess compound material. The same compound is also used to cover nail and screw depressions in the panel caused by the installation of mechanical structures.

On large projects, Tapers may use automatic taping tools that apply the joint compound and tape in one step. Of utmost importance in drywall finishing is drying time since drywall compounds require water or vinyl binders that require time for application and cure time to dry. The choice of compounds will affect drying time and finished effect. A *hot mud* compound can reduce the drying time to between 5 and 90 minutes, but the chemicals it contains could cause undesired effects on the finished wall or ceiling.

Tapers apply second and third coats of the compound, sanding the treated areas where needed after each coat to create a smooth, clean surface on which paint or other wall coverings can be applied. The process for finishing drywall has evolved over many decades and is an overlapping process in which each step or application has an effect on the next step.

When the job requires it, Tapers will apply textured surfaces to walls and ceilings using various finishing techniques and drywall tools such as trowels, brushes, or spray guns. Drywall Finishers and Decorators sometimes work with materials that are hazardous or toxic, such as when they are required to remove lead-based drywalls. In the most dangerous situations, Drywall Finishers work in a sealed self-contained suit to prevent inhalation of or contact with hazardous materials.

Additional Information/Contact

For more information about IUPAT apprenticeships or work opportunities, contact a Local of the International Union of Painters and Allied Trades, a local Joint Union-Management Apprenticeship Agency, or the nearest office of the State Employment Service or State Apprenticeship Agency.

For general information about the work and training for IUPAT, contact:



International Union of Painters and Allied Trades (IUPAT)
7234 Parkway Drive
Hanover, MD 21076
Internet: <http://www.iupat.org>



Finishing Trades Institute (FTI)
7230 Parkway Drive
Hanover, MD 21076
Internet: <http://www.finishingtradesinstitute.org/>



Labor Management Cooperative Initiative (LMCI)
7234 Parkway Drive
Hanover, MD 21076
Internet: <http://www.lmcionline.org/>



Finishing Contractors Association (FCA)
8120 Woodmont Avenue, Suite 520
Bethesda, Maryland 20814
Internet: <http://www.finishingcontractors.org>

Program Level Competencies

With reference to each of the respective areas of the Drywall Finishing occupation, apprentices successfully completing this program will be able to:

Drywall Finishing Trade

- Explore trade options as they pertain to the Drywall Finishing industry.
- Examine principles of Drywall installation and finishing.
- Identify trade-related materials and applications.
- Utilize trade-related tools and equipment.
- Interpret drawings related to the Drywall Finishing occupation.
- Apply trade math calculations.
- Apply the standards of quality control and quality assurance in the Drywall Finishing industry.
- Exemplify the qualities and characteristics necessary to be a leader in the Drywall Finishing industry.

Suggested Program of Study for the Drywall Finisher Curriculum

The IUPAT/FTI Program of Study for the Drywall Finisher OJL and Related Instruction is outlined below. Under this hybrid approach, an apprentice must participate in the indicated minimum number of hours of OJL for each category of the program. The Program Sponsor is responsible for determining the number of RI hours that an apprentice must participate in based on the FTI guidance, local needs, and the mandated minimum of 144 hours per year (29 CFR 29.5(b)(4)).

CATEGORY #	CATEGORY NAME	OJL HOURS	RI HOURS
1.1-3.4	Core Curriculum	32	96
5.1	Health and Safety Awareness for the Drywall Finisher	100 - 200	40
5.2	Introduction to the Drywall Trade	20 - 60	40
5.3	Materials of the Drywall Trade	40 - 100	40
5.4	Tools of the Drywall Trade	40 - 100	40
5.5	Filling, Taping and Sanding Applications	1450 - 2450	100
5.6	Automatic Taping Tools of the Drywall Trade	400 – 750	60
5.7	Advanced Drywall Applications and Systems	400 - 750	60
		2482 - 4442	476

WORK PROCESS SCHEDULE
 RELATED INSTRUCTION OUTLINE
 Drywall Finisher (Taper)
 O*NET-SOC CODE: 47-2082.00 RAPIDS CODE: 0561HY

This table identifies the course competencies that the Drywall Finisher apprentice will successfully complete.

Module 5.0 – Drywall Finisher

5.1	HEALTH AND SAFETY AWARENESS	
	On-the-Job Learning (OJL) – 100 - 200 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Don (put on), doff (remove), inspect, and maintain the proper PPE that should be worn during drywall finishing including, but not limited to: <ul style="list-style-type: none"> • Head • Face • Eyes • Ears • Hands • Body • Feet • Respiratory • Perform a job analysis for safe working conditions: <ul style="list-style-type: none"> • Attend pre-job safety meetings • Adhere to site specific safety rules and federal regulations • Observe Vessel Entry/Confined Space regulations • Read and interpret MSDS • Establish and maintain a safe working perimeter • Safely demonstrate the proper use and maintenance of drywall tools and equipment. • Maintain clean work areas (housekeeping). • Store, handle, and transport tools, equipment and materials properly. • Identify the locations of First Aid and Fire Equipment. • Demonstrate safe work practices for erecting and dismantling scaffolds, including: pre-planning, inspecting scaffold components, load capacity, platform construction, access requirements, and fall protection. 	<ul style="list-style-type: none"> • Recognize the important areas of OSHA in general terms. • Identify the Safety Regulations as they apply to safe work practices in the drywall trade with emphasis on: <ul style="list-style-type: none"> • Identification of safety hazards (unsafe conditions) • Proper handling of materials, including hazardous • Maintenance and safe operation of tools • PPE • Describe the precautions that must be followed when using flammable liquids and adhesives. • Explain what a Material Safety Data Sheet (MSDS) is, its purpose and limitation. • Describe the role of employer, supplier, and worker in the education of workers. • Outline emergency procedures and how to obtain assistance for injured workers. • Describe the proper technique (ergonomics) for lifting and transporting drywall materials. • Identify safety requirements for erecting and dismantling scaffolds, including: pre-planning, inspecting scaffold components, calculating load capacity, platform construction, access requirements, and fall protection. • Identify the different types of aerial lifts and their related safety rules and precautions. • Describe potential fall hazards in the workplace. • Describe the different types of ladders and the conditions under which they are used. • Given illustrations or verbal clues, distinguish between a proper and improper workplace set-up with regard to hazards, safety equipment and stilt selection.

	<ul style="list-style-type: none"> • Demonstrate a pre-inspection and the safe operation of an aerial lift. • Describe and demonstrate the proper use of various types of personal fall protection equipment. • Describe and demonstrate the steps of ladder safety, including: selection, inspection, set-up, safe techniques and proper maintenance and storage. • Demonstrate and describe the procedures for personally fitting and adjusting, and mounting and dismounting stilts. 	
5.2	INTRODUCTION TO THE DRYWALL TRADE	
	On-the-Job Learning (OJL) – 20 - 60 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Demonstrate the characteristics of a professional Drywall Finisher, including: <ul style="list-style-type: none"> • Exhibit suitable appearance and personal hygiene. • Exhibit proper attitude and behavior on the job site, including private residences and other occupied buildings. • Deal with difficult customers in a professional and courteous manner. • Interpret written and verbal instructions. • Recognize the importance of cooperation and interaction with related trades on a job site. • Demonstrate the ability to follow specific work place protocol and procedures. 	<ul style="list-style-type: none"> • Identify and explain the basic terminology used in the drywall trade. • Describe the reasons why drywall finishing succeeded over conventional plastering. • Describe the working conditions of the drywall trade. • Identify the career options and advancement opportunities in the drywall trade. • Describe custody, care, and maintenance of tools and equipment.
5.3	MATERIALS OF THE DRYWALL TRADE	
	On-the-Job Learning (OJL) – 40 - 100 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Differentiate between the lengths, thickness, and widths of drywall panels, including: <ul style="list-style-type: none"> • Lengths (6, 8, 9, 10, 12, 14, and 16 feet) • Thickness (1/4, 5/16, 3/8, 1/2, 5/8, 3/4, and 1 inch) • Widths (24, 48, 54 inches) • Differentiate between various types of fillers. • Determine that proper lighting is present for all surfaces. • Inspect and prepare surfaces and recognize when pre-filling is required. • Ensure that adequate ventilation and temperature is maintained for optimum performance. • Properly handle, transport, and store drywall materials. 	<ul style="list-style-type: none"> • Identify the size, types, and application of drywall panels. • Identify various types of drywall beads and trims used in the drywall trade. • Identify various types of fasteners and adhesives used in the drywall trade (nails and screws). • Identify different types of substrates. • Identify different fireproof/firestop materials used in the drywall trade. • Identify types and applications of various drywall boards, including: <ul style="list-style-type: none"> • Standard • Fire Resistant • Foil Back • Water Resistant

	<ul style="list-style-type: none"> • Determine the type of compound to use based on the substrate. • Determine when it is necessary to use shims in the drywall installation process. • Safely use the various types of drywall tools. • Locate and prepare mixing area. 	<ul style="list-style-type: none"> • Exterior Ceiling Panels • Interior Ceiling Panels • Veneer-based Panels • List the advantages and limitations of drywall construction. • Explain the various kinds of beads including: <ul style="list-style-type: none"> • Metal • Paper Faced Metal • Plastic • Identify different types of framing materials. • Identify the various types of drywall compound and the purpose of using compounds. • Identify the different types of drywall tape (paper and fiberglass).
5.4	TOOLS OF THE DRYWALL TRADE	
	On-the-Job Learning (OJL) – 40 - 100 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Select and use the proper drywall hand tool for specific tasks. • Display the proper handling and balancing of drywall hand tools. • Modify hand taping tool handles and blades and the process for preparing the tools for proper use. • Explain and demonstrate proper inspection and maintenance procedures for keeping hand taping tools in good and clean condition. • Display the appropriate PPE when using hand taping tools. 	<ul style="list-style-type: none"> • Identify the tools of the drywall trade, including but not limited to: <ul style="list-style-type: none"> • Hawk • Trowels (straight, curved, specialty) • Mud, Pan or Tray • Taping Knives and Broad Knives • Putty Knives or Elastic Knives • Corner Tools • Mud Pan Holders and Tape Holders • Hammers • Phillips Screwdrivers • Utility Knives • Aviation Style Snips or Tin Snips • Sanding Tools • Pole Sander • Mud Masher or Potato Masher • Small Tools • Slicker and Straight Edges • Texturing Tools • Measuring Tape or Tape Rule • Cleaning Tools • Tool Bag and Tool Boxes • 24" Level • Combination Square • Pocket Plane or Drywall Rasp

		<ul style="list-style-type: none"> • Mitre Box • Chalk Line and Plumb • Winder with Braided Nylon (dry line) • Pliers, Wrench, Combination Screwdriver • Drywall Saw • Screw Gun • Drill • Dimpler Attachment • Utility Wet/Dry Vacuum Cleaner • Wallboard Hammer
5.5	FILLING, TAPING AND SANDING APPLICATIONS	
	On-the-Job Learning (OJL) – 1450 - 2450 hours	Related Instruction (RI) – 100 hours
	<ul style="list-style-type: none"> • Demonstrate the different uses for the various filling compounds. • Select and mix the proper filling compounds. • Demonstrate the filling mixing procedures, including pre-mix, powdered, and fast-set fillers. • Demonstrate the three main taping methods, including: <ul style="list-style-type: none"> • Hand Taping • Mechanical • Banjo • Differentiate between paper and fiberglass tape. • Apply fillers using the proper tools in the three main taping methods. • Demonstrate the wiping procedures and sequence for dry taping and wet taping. • Demonstrate the proper procedure, and sequence for wiping non-90° angles. • Follow proper mixing procedures for filling compound. • Demonstrate how to properly apply fireproofing/firestop materials (firetape, fire caulking, and firestop). • Correct problems that can arise while wiping angle tapes. • Repair and load flat finishing boxes. • Demonstrate the procedure for filling the following: <ul style="list-style-type: none"> • flat joints using flat finishing boxes • butt joints using flat finishing boxes • ceiling joints using flat finishing boxes 	<ul style="list-style-type: none"> • Recognize the general characteristics of fillers. • Identify the correct filler and consistency for the task. • Describe the characteristics, elements, and formulations of filling compounds. • Explain drying times and the relation to temperature, humidity, and ventilation in the finishing process. • Describe the differences between the various fillers. • Identify and describe problems related to moisture and drying. • Identify and describe the three main taping techniques, including: <ul style="list-style-type: none"> • Hand Taping • Mechanical • Banjo • Describe the characteristics of paper tape and fiberglass tape. • Describe the advantages and limitations of paper tape and fiberglass tape. • Describe the hand taping and wiping procedures. • Describe in the proper sequence the dry and wet taping procedures. • Identify the problems that can arise while wiping angle tapes. • Identify the tools and equipment used for wiping tapes, including: <ul style="list-style-type: none"> • Rollers • Angle Finishers • Putty and Elastic Knives • Describe the functions and operations of flat finishing boxes, fastener spotters, and angle finishing boxes. • Explain the use of and reasons for flat finishing boxes.

	<ul style="list-style-type: none"> • Demonstrate the procedure for filling fasteners using fastener spotters. • Perform the procedure for filling vertical and horizontal angles using angle finishing boxes. • Demonstrate the procedure for filling the following: <ul style="list-style-type: none"> • Bottoms • Three-ways • Non-90° angles • Demonstrate the correct holding position for trowels and knives. • Demonstrate the types and functions of filler coats, including: <ul style="list-style-type: none"> • First Coat • Second Coat • Third Coat • Skim (level 5) • Demonstrate the application of the five (5) levels of drywall finishes. • Distinguish a finish level by observation; identify the steps needed to take it to the next level of finish. • Demonstrate the procedure for wiping angles with a former finish. • Demonstrate how to wipe horizontal, vertical, and three-way angles. • Demonstrate how to clean and maintain wiping equipment. • Demonstrate dry hand sanding and touch up. • Handle and use a pole sander. • Demonstrate dustless sanding. • Select and use the appropriate tools to install beads and trims. • Demonstrate application procedures for measuring and cutting beads and trims. • Demonstrate application of fillers/compounds. 	<ul style="list-style-type: none"> • Describe the use of angle finishing boxes. • Identify the correct filler and consistency for the task. • Describe the application of second coat. • Describe the application of third coat (skim coat). • Describe the application of level five (5) finish and round surfaces. • Identify the correct filler and application for spotting screws/nails. • Identify various types of sandpaper and applications. • Identify and describe the different types of beads and trim. • Describe the proper installation of beads and trims. • Identify the correct filler needed for coating.
5.6	AUTOMATIC TAPING TOOLS OF THE DRYWALL TRADE	
	On-the-Job Learning (OJL) – 400 - 750 hours	Related Instruction (RI) – 60 hours
	<ul style="list-style-type: none"> • Demonstrate the automatic taping tool sequence. • Demonstrate the procedures for loading tape in the automatic taping tool. • Demonstrate the operation of the loading pump. • Display the proper holding techniques for proper operation and 	<ul style="list-style-type: none"> • Identify the various types of automatic taping tools. • Explain the operation of the automatic taping tools. • Discuss the importance of using a teamwork approach to automatic tool taping. • Explain inspection and maintenance procedures for keeping tools in

	<p>to minimize stress or injuries while using automatic taping tools when taping, including:</p> <ul style="list-style-type: none"> • Lower butt joints • Wall flats • Ceiling flats and butt joints • Vertical angles • Horizontal angles <ul style="list-style-type: none"> • Demonstrate proper inspection and maintenance procedures for keeping automatic taping tools in proper working condition by replacing the cutting blade, cable, and tape and feed needle. • Demonstrate the appropriate cleaning procedures for all automatic taping tools. 	<p>good and clean condition.</p> <ul style="list-style-type: none"> • Identify common problems and their solutions associated with using automatic taping tools.
5.7	ADVANCED DRYWALL APPLICATIONS AND SYSTEMS	
	<p>On-the-Job Learning (OJL) – 400 - 750 hours</p> <ul style="list-style-type: none"> • Demonstrate the methods for making repairs to common defects. • Demonstrate proper mixing procedures and consistency of filling compounds and fast-set fillers. • Recognize common defects in drywall finishing. • Perform the procedures for repairing the following wallboard defects, including: <ul style="list-style-type: none"> • Hollow Areas • Ridged Joints • Nail Pops, Loose Filler, and Gouges • Cracks • Water and Fire Damage • Plaster and Stains • Textures • Demonstrate the proper procedures for repairing beads and trim. • Select appropriate tools, equipment, and materials for texturing. • Prepare the surface prior to applying texture. • Recognize areas that need to be painted prior to applying texture. • Apply the various types of hand texture on a surface. • Demonstrate the proper use of the various types of texturing 	<p>Related Instruction (RI) – 60 hours</p> <ul style="list-style-type: none"> • Identify the methods for making repairs in common defects. • Describe the methods for repairing gouges and patching holes. • Describe the reason and method for keying painted surfaces. • Identify and describe the different types of texture (soft, hard, self-priming). • Identify protective covering such as polyethylene sheeting, stapled or taped and masked machine. • Describe general texture spraying techniques. • Describe different types of texture such as knockdown, splatter, skip troweling, Spanish style, brick and stone imitations, and orange peel. • Identify the different types of texturing machines. • Describe the cleaning procedures for texturing machines. • Describe techniques of repairing damaged texture. • Describe various types of hand texturing such as one-coat stipple patterns. • Explain the basics of Exterior Insulated and Finish Systems (EIFS) theory. • Identify properly installed and acceptable substrate materials, conditions, and preparation. • Identify the proper tools required for applying EIFS. • Describe proper means of adhesive application and attachment. • Describe the application of different mesh types and how they affect impact resistance.

<p>machines.</p> <ul style="list-style-type: none"> • Use power compressors, selecting correct orifices and pressures. • Repair damaged texture. • Clean and maintain texturing tools and machines. • Select appropriate tools, equipment, and materials for Exterior Insulated and Finish Systems (EIFS). • Recognize and use the proper tools for: <ul style="list-style-type: none"> • Adhesive Application • Expanded polystyrene (EPS) Cutting and Rasping • Base Coat Application • Finish Applications • Assess and prepare the substrate. • Report any surface deficiencies. • Apply membranes and barriers. • Recognize EPS board, proper mesh embedment, and base coat application. • Install rigid insulation board. • Demonstrate the proper methods of EPS board installation. • Apply base coats and reinforcing mesh. • Apply finish coats. • Locate areas requiring expansion or control joints. • Demonstrate the application of Exterior EIFS accents and aesthetic reveals. • Execute proper mesh embedment and base coat application. • Evaluate and determine a successful finish application based on EIFS manufacturer's requirements. 	<ul style="list-style-type: none"> • Describe the procedures for installing building systems that integrate a resinous cladding with a continuous layer of insulation on the exterior of a building or structure.
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IUPAT/FTI

Floor Coverer (Floor Layer)

Program Competencies

O*NET-SOC CODE: 47-2042.00

RAPIDS CODE: 0199HY

WORK PROCESS SCHEDULE
RELATED INSTRUCTION OUTLINE
Floor Coverer (Floor Layer)
O*NET-SOC CODE: 47-2042.00 RAPIDS CODE: 0199HY

IUPAT/FTI Floor Coverer Course Competencies

The Program level curriculum builds upon the foundation of the core curriculum skills, knowledge, and abilities. At the program level, occupation-specific standardized curriculum is designed by an ad-hoc committee comprised of the FTI Curriculum Department, IUPAT/FTI subject matter experts, employers, manufacturers, and associations.

Apprentices will be assessed on their acquisition of knowledge, skills and abilities in the core curriculum through hands-on and written tests as well as the OJL performance measures.

Additionally, the apprentices will integrate their core knowledge, skills and abilities into the pursuit of specific craft training throughout the term of their apprenticeship. This program specific training is designed to build the technical and professional skills needed by the apprentice to successfully perform his/her trade profession.

Floor Coverer Apprenticeship Program

The Floor Coverer Apprenticeship Program is co-sponsored by the IUPAT/FTI to meet the ever-changing needs of the industry and the affiliates it serves. The apprenticeship program ensures that apprentices will learn the theoretical knowledge and the practical skills necessary to be a successful Floor Coverer. During this program of study, apprentices will successfully complete the IUPAT/FTI core curriculum and integrate it into the Floor Coverer craft specific training. Apprentices successfully completing this program apply their skills and abilities as Floor Coverer.

Description of Occupation

Floor Coverers generally work indoors and provide a basic flooring function. Floor Coverers add decorative qualities to their finished work that enhances the appeal of the building. Work is typically done in homes, offices, hospitals, stores, restaurants, and in many other structures. Floor Coverers (carpet installers, floor installers and floor layers, and floor sanders and finishers) will each learn the tools of their specific flooring trade. Workers in the floor covering trade must be able to work with plans and/or blueprints and apply math skills to measure, purchase, and install the materials for the best possible finished floor. Workers in this trade must also be able to inspect floor surfaces for imperfections and know how to correct the flaw prior to beginning the job. Safe work habits are also emphasized in this trade.

Training/Skill Set

The Flooring industry uses Apprenticeship Training as its greatest opportunity to expand the workforce. People with limited or no experience in the flooring industry can use the available apprenticeship program as a catalyst to becoming a qualified journeyworker in the trade.

The flooring curriculum and training will provide the skills, knowledge, and abilities needed to meet the needs of the industry and to ensure that each worker is equipped to use the technology, materials, and applicable methods of installation as well as adhering to all quality and safety standards on the job.

Floor Coverers learning their trade through an apprenticeship program will receive relevant classroom training as well as OJL and experience. The OJL may include tasks such as preparing surfaces to receive flooring, installing stripping and padding, stretching newly installed carpet, and using tools of the trade. They will progress to learning how to cut and install the various floor coverings.

Skills needed to become carpet and floor finishers include manual dexterity, eye-hand coordination, physical fitness, and a good sense of balance and color. The ability to solve arithmetic problems quickly and accurately is also needed. As a supervisor, salesperson or estimator, carpet and floor finishers should be able to identify and estimate the quantity of materials needed to complete a job, accurately estimate how long a job will take to complete, and compute the cost of the job.

Emphasized early in the apprentice's career is adherence to and knowledge of OSHA standards for personal safety; safety on the job site; and proper handling of tools, materials and equipment. Additionally, the apprentice will discuss safe work practices when working with flooring materials and various obstacles that may be encountered on the job, such as moving and lifting heavy objects.

Working Environment

Floor Coverers generally work indoors and have regular daytime hours. When the job has them working in an office or occupied store, then they may be required to work evenings and weekends to avoid disruption of the business to its customers and/or employees.

Although the work is labor intensive, the conditions under which Floor Coverers typically work are favorable since most construction has been completed and the work area is relatively clean and uncluttered.

Additional Information/Contact

For more information about IUPAT apprenticeships or work opportunities, contact a Local of the International Union of Painters and Allied Trades, a local Joint Union-Management Apprenticeship Agency, or the nearest office of the State Employment Service or State Apprenticeship Agency.

For general information about the work and training for IUPAT, contact:



International Union of Painters and Allied Trades (IUPAT)
7234 Parkway Drive
Hanover, MD 21076
Internet: <http://www.iupat.org>



Finishing Trades Institute (FTI)
7230 Parkway Drive
Hanover, MD 21076
Internet: <http://www.finishingtradesinstitute.org/>



Labor Management Cooperative Initiative (LMCI)
7234 Parkway Drive
Hanover, MD 21076
Internet: <http://www.lmcionline.org/>



Finishing Contractors Association (FCA)
8120 Woodmont Avenue, Suite 520
Bethesda, Maryland 20814
Internet: <http://www.finishingcontractors.org>

Program Level Competencies

With reference to each of the respective areas of the Floor Covering occupation, apprentices successfully completing this program will be able to:

Floor Coverer

- Explore trade options as they pertain to the floor covering industry.
- Identify trade-related materials and applications.
- Distinguish between the various floor covering installation materials and applications.
- Install, repair and replace floor covering materials.
- Utilize trade-related tools and equipment.
- Interpret drawings related to the floor covering trade.
- Apply math calculations related to the floor covering trade.
- Demonstrate the proper measurement, preparation, and installation methods of the floor covering industry.
- Apply the standards of quality control and quality assurance in the floor covering industry.
- Exemplify the qualities and characteristics necessary to be a leader in the floor covering industry.

Suggested Program of Study for the Floor Coverer Curriculum

The IUPAT/FTI Program of Study for the Floor Coverer OJL and Related Instruction is outlined below. Under this hybrid approach, an apprentice must participate in the indicated minimum number of hours of OJL for each category of the program. The Program Sponsor is responsible for determining the number of RI hours that an apprentice must participate in based on the FTI guidance, local needs, and the mandated minimum of 144 hours per year (29 CFR 29.5(b)(4)).

CATEGORY #	CATEGORY NAME	OJL¹ HOURS	RTI² HOURS
1.1-3.4	Core Curriculum	32	96
6.1	Health and Safety Awareness for the Floor Coverer	100 - 200	40
6.2	Introduction to the Floor covering Trade	200 - 300	40
6.3	Floor Preparation	800 - 1000	40
6.4	Materials and Tools of the Floor covering Trade	200 - 500	40
6.5	Installation Methods for Resilient Floor covering	1000 - 1400	80
6.6	Installation Methods for Laminate and Hardwood Flooring	800 - 1200	60
6.7	Installation Methods of Carpet and Synthetic Turf	1000 - 1400	80
		4132 - 6032	476

¹ Refers to a Minimum – Maximum range of OJL hours that an apprentice must participate in during the specific apprenticeship program. An apprentice can take hands-on assessments in order to be awarded credit for these hours as determined by the District Council.

² Refers to the IUPAT/FTI suggested number of RI hours an apprentice should participate in during the specific apprenticeship program. However, the number of RI hours that an apprentice must participate in is determined by the District Council but must be at a minimum of 144 hours per year.

WORK PROCESS SCHEDULE
 RELATED INSTRUCTION OUTLINE
 Floor Coverer (Floor Layer)
 O*NET-SOC CODE: 47-2042.00 RAPIDS CODE: 0199HY

This table identifies the course competencies that the Floor Coverer apprentice will successfully complete.

Module 6.0 – Floor Coverer

6.1	HEALTH AND SAFETY AWARENESS	
	On-the-Job Learning (OJL) – 100 - 200 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Don (put on), doff (remove), inspect, and maintain the proper PPE that should be worn during floor covering including, but not limited to: <ul style="list-style-type: none"> • Head • Face • Eyes • Ears • Hands • Body • Feet • Respiratory • Perform a job analysis for safe working conditions: <ul style="list-style-type: none"> • Attend pre-job safety meetings • Adhere to site specific safety rules and federal regulations • Observe Vessel Entry/Confined Space regulations • Read and interpret MSDS • Establish and maintain a safe working perimeter • Safely demonstrate the proper use and maintenance of floor covering tools including, but not limited to: <ul style="list-style-type: none"> • Basic Tools • Fastening Tools • Scribes • Cutting Tools • Hand Saws • Straight Edges • Trowel • Spreaders 	<ul style="list-style-type: none"> • Recognize the important areas of OSHA in general terms. • Identify the Safety Regulations as they apply to safe work practices in the floor covering trade with emphasis on: <ul style="list-style-type: none"> • Identification of safety hazards (unsafe conditions) • Proper handling of materials, including hazardous • Maintenance and safe operation of tools • PPE • Describe the precautions that must be followed when using flammable liquids and adhesives. • Explain what a Material Safety Data Sheet (MSDS) is, its purpose and limitation. • Describe the role of employer, supplier, and worker in the education of workers. • Outline emergency procedures and how to obtain assistance for injured workers. • Describe the proper technique (ergonomics) for lifting and transporting floor covering materials.

	<ul style="list-style-type: none"> • Power Tools • Maintain clean work areas (housekeeping). • Store, handle, and transport tools, equipment and materials properly (including forklift operation). • Identify the locations of First Aid and Fire Equipment. 	
6.2	INTRODUCTION TO THE FLOOR COVERING TRADE	
	On-the-Job Learning (OJL) – 200 - 300 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Demonstrate the characteristics of a professional Floor Coverer, including: <ul style="list-style-type: none"> • Exhibit suitable appearance and personal hygiene. • Exhibit proper attitude and behavior on the job site, including private residences and other occupied buildings. • Deal with difficult customers in a professional and courteous manner. • Interpret written and verbal instructions. • Recognize the importance of cooperation and interaction with related trades on a job site. 	<ul style="list-style-type: none"> • Identify and explain the basic terminology used in the floor covering trade. • Identify the historical events of the modern floor covering trade. • Describe the working conditions of the floor covering trade. • Identify the career options and advancement opportunities in the floor covering trade. • Differentiate between the various materials used in the floor covering trade, including resilient, carpet, laminate, hardwood, moldings, adhesives, and underlay. • Describe custody, care, and maintenance, of tools and equipment.
6.3	FLOOR PREPARATION	
	On-the-Job Learning (OJL) – 800 - 1000 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Recognize the different types of substrates in the floor installation process. • Conduct a moisture test on a given substrate. • Prepare substrate depending on grade level and type of flooring materials to be installed. • Identify substrate defects and describe how to resolve them. • Demonstrate the methods of cleaning, priming, patching, and leveling substrates. • Inspect substrates and recognize conditions that will impact final flooring product installation. • Demonstrate proper sanding, scraping, sweeping, and filling procedures to receive any type of flooring. • Observe manufacturer's HVAC recommendation for installation area. 	<ul style="list-style-type: none"> • Identify the different types of substrates. • Define grade level and explain its importance in floor covering. • Identify the types of moisture issues on various substrates and explain why moisture tests are made on substrates. • Determine how to prepare new concrete floors before installing floor coverings. • Define curing and parting compounds and explain their uses. • Determine the use of a primer in the floor covering installation process. • Identify the minimum clearance for ventilated suspended concrete floors. • Identify the minimum drying time for new concrete. • Explain the importance of underlayment's in floor covering installation process. • List and identify the types of board underlayments (hardboard, plywood, and particle board). • Explain the issues with installing new floor covering over existing floor covering. • Describe the methods to re-do an existing coved floor.

		<ul style="list-style-type: none"> • Determine the coarseness used for sanding strip wood floors. • Describe the hazards of removing existing floors.
6.4	MATERIALS AND TOOLS OF THE FLOOR COVERING TRADE	
	On-the-Job Learning (OJL) – 200 - 500 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Recognize the problems a Floor Coverer may encounter with the different types of floors used in the floor covering industry, including: <ul style="list-style-type: none"> • On Grade or Below Grade Concrete Floors • Suspended Concrete Floors • Magnesite Floors • Floors with Asphaltic Underlayment or Lightweight Aggregate • Wood Floors • Nonporous Surfaces • Differentiate between the different types of resilient floor coverings. • Recognize the advantages of resilient floor coverings. • Differentiate between the different types hardwood floors. • Determine the appropriate type of trim to use when resilient floor coverings are a different thickness. • Properly install the appropriate trim product. • Demonstrate the proper procedure(s) for applying the appropriate adhesive, primers, and sealers. • Provide adequate ventilation when using adhesives, primers, and sealers. • Perform the proper procedure for installing the appropriate underlayment for a given floor installation. • Demonstrate the appropriate techniques for installing a floor system over concrete. • Safely use the various types of basic hand tools, special hand tools, cutting tools, miscellaneous tools, and power tools. 	<ul style="list-style-type: none"> • Identify and describe the characteristics of the different types of resilient floor covering, including: <ul style="list-style-type: none"> • Linoleum • Homogenous PVC Sheet Vinyl • Inlaid Sheet Vinyl • Rotovinyl • Cushioned Sheet Vinyl • Resilient Tile (soft tile) • Asphalt Tile • Vinyl Composition Tile (VCT) • Cork Tile • Rubber Tile • Identify the different types of safety flooring and where it is appropriate to install them. • Identify the three distinct layers in all laminate flooring (surface, core, backing). • Identify the different types of hardwood floors, including: <ul style="list-style-type: none"> • Solid • Engineered • Parquet • Floating • Longstrip • Exotic • Hand scraped • Name the three classifications of Electrostatic Discharge (ESD) control flooring. • Identify the different types of carpet including backings, surface fibers, and their properties (wool, nylon, acrylics, polypropylene, polyester, recycled, synthetic turf). • Identify and describe the various types of trim products used in the floor

		<p>covering industry, including:</p> <ul style="list-style-type: none"> • Cap Moldings • Cove rim (cove metal trim) • Transitional Metal • Finish Metal • Cove Base Fittings • Binder Bar • Stair Noising <ul style="list-style-type: none"> • Identify the various types of adhesives used in the floor covering industry, including: <ul style="list-style-type: none"> • Water-Soluble Paste • Asphalt-based Adhesives • Epoxy Cements • Adhesives for Sheet Vinyl (multipurpose adhesives, acrylic latex adhesives, and perimeter floor adhesives) • Adhesives for Vinyl Composition Tile (thin spread, contact cement, cove base cement, pressure sensitive cement) • Eco-friendly • Explain the significance of Primers and Sealers when applying adhesives. • Identify and describe the different types of underlayments and their properties that are commonly used in the floor covering industry, including: <ul style="list-style-type: none"> • Plywood • Hardboard • Lining Felt • Composition Felt • Concrete • Identify and describe the basic hand tools used in the floor covering industry, including: <ul style="list-style-type: none"> • (adjustable wrenches, awls, broad knives, chalk lines, chisels, duster brushes, files, hammers, knives, nail sets, pliers, push brooms, saws, screwdrivers, steel squares, tapes, tin snips/aviation shears, trowels, etc.) • Identify and describe the special hand tools used in the floor covering industry, including: <ul style="list-style-type: none"> • Fastening Tools (spot nailers, power nailers, hammer staples, brad pusher, special hammers, electric tacker, etc.) • Scribes (divider type scribe, under scribe, hinged scribe, bar
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		<p>scriber, outside corner scriber, pin vise, etc.)</p> <ul style="list-style-type: none"> • Cutting Tools (linoleum knife, hook knife, rubber cove base cutter, tile cutter, metal miters, miter boxes, etc.) • Miscellaneous Special Tools (straightedges, base shoe lifters, scrapers, rollers, trowels & spreaders, torches & heat guns, moving equipment, tile scooter, knee kicker, power stretcher, etc.) • Identify and describe the power tools used in the floor covering industry, including: <ul style="list-style-type: none"> • sander, strippers, buffers, drills, circular saws, vacuum cleaners, air compressors, hot metal glue guns, wood routers, special routers, soldering guns, hot air welders, heat blow guns, air sled, hot melt seaming iron, etc.
6.5 INSTALLATION METHODS FOR RESILIENT FLOOR COVERING		
	On-the-Job Learning (OJL) – 1000 - 1400 hours	Related Instruction (RI) – 80 hours
	<ul style="list-style-type: none"> • Demonstrate the measuring procedures to determine the required amount of materials needed for installation of all types of resilient flooring. • Demonstrate the layout and installation procedures to properly install manufacturer’s material. • Demonstrate installation techniques for various types of resilient flooring including but not limited to safety flooring, rotovinyl, linoleum, rubber, cork, VCT, PVC, sheet vinyl, and vinyl conductive. • Select and safely use the appropriate tools to install resilient floor coverings. • Demonstrate knowledge of adhesive and substrate compatibility. • Demonstrate knowledge of proper trowel notch sizes as recommended by product manufacturers. • Demonstrate knowledge of proper cutting, fitting and seaming for various resilient flooring methods including pattern scribing (self-coving). • Demonstrate knowledge of proper installation and fitting of top-set cove base. • Demonstrate knowledge of proper job completion skills. • Observe manufacturer’s HVAC recommendations for installation area. • Demonstrate heat welding techniques and skills. 	<ul style="list-style-type: none"> • Identify and describe the characteristics of the different types of resilient floor covering, including: <ul style="list-style-type: none"> • Linoleum • Homogenous PVC Sheet Vinyl • Inlaid Sheet Vinyl • Rotovinyl • Cushioned Sheet Vinyl • Resilient Tile (soft tile) • Asphalt Tile • Vinyl Composition Tile (VCT) • Cork Tile • Rubber Tile • Explain the advantages and limitations of using resilient floor coverings. • Identify the appropriate tools to use to install resilient floor coverings.

	<ul style="list-style-type: none"> • Demonstrate techniques and skills for proper repair and replacement procedures. • Demonstrate knowledge of proper job completion skills. • Successfully complete the requirements for industry recognized manufacturer training and certifications, such as Forbo, Armstrong, Ardex Henry, Shaw, Mohawk, Tarkett, Nora Rubber, etc. 	
6.6	INSTALLATION METHODS FOR LAMINATE AND HARDWOOD FLOORING	
	On-the-Job Learning (OJL) – 800 - 1200 hours	Related Instruction (RI) – 60 hours
	<ul style="list-style-type: none"> • Demonstrate the measuring procedures to determine the required amount of materials needed for installation. • Demonstrate the layout and installation procedures to properly install manufacturer's materials. • Demonstrate installation techniques for various types of laminated and hardwood flooring. • Select and safely use the appropriate tools to install laminated and hardwood floor coverings. • Demonstrate knowledge of adhesive and substrate compatibility including underlayment for floating floors. • Demonstrate knowledge of proper trowel notch sizes as recommended by product manufacturers. • Demonstrate knowledge of proper cutting and fitting for various hardwoods and laminate flooring. • Demonstrate knowledge of proper installation and fitting of trim and wood base. • Observe manufacturer's HVAC recommendations for installation area. • Demonstrate techniques and skills for proper repair and replacement procedures. • Demonstrate knowledge of proper job completion skills. • Successfully complete the requirements for industry recognized manufacturer training and certifications (Forbo, Armstrong, Ardex Henry, Shaw, Mohawk, Tarkett, Nora Rubber, etc). 	<ul style="list-style-type: none"> • Identify the three distinct layers in all laminate flooring, including: <ul style="list-style-type: none"> • Surface • Core • Backing • Identify the different types of hardwood floors, including: <ul style="list-style-type: none"> • Solid • Engineered • Parquet • Floating • Longstrip • Exotic • Hand scraped • Name the three classifications of Electrostatic Discharge (ESD) control flooring. • Explain the advantages and limitations of using laminate and hardwood floor coverings. • Identify the appropriate tools to install laminate and hardwood flooring.
6.7	INSTALLATION METHODS FOR CARPET AND SYNTHETIC TURF	
	On-the-Job Learning (OJL) – 1000 - 1400 hours	Related Instruction (RI) – 80 hours
	<ul style="list-style-type: none"> • Demonstrate the measuring procedures to determine the required amount of materials needed for installation. • Demonstrate the layout and installation procedures to properly 	<ul style="list-style-type: none"> • Identify the different types of carpet including backings, surface fibers, and their properties (wool, nylon, acrylics, polypropylene, polyester, recycled, synthetic turf).

<ul style="list-style-type: none"> • install manufacturer's material on all surfaces including stairs. • Demonstrate the installation techniques for various types of indoor and outdoor carpet and synthetic turf. • Select and safely use the appropriate tools on carpet and synthetic turf. • Demonstrate knowledge of adhesive and substrate compatibility for glue down carpet, padding for conventional carpet and turf substrates. • Demonstrate knowledge of proper trowel notch sizes as recommended by product manufacturers. • Demonstrate knowledge of proper cutting and fitting for various types of carpet and turf flooring. • Demonstrate knowledge of proper installation and fitting of trim. • Properly handle and store carpet in manner that prevents damage and distortion. • Consult the manufacturer for specific installation requirements and warranty conditions as they pertain to pile direction and pattern matching. • Refer to carpet manufacturer guidelines prior to installation. • Observe manufacturer's recommendations for seaming carpet edges. • Follow manufacturer's recommendations for double-glue-down, stretch, modular and pre-applied adhesive systems peel and stick installation. • Demonstrate knowledge and skills in pattern alignment and installation proficiencies. • Demonstrate knowledge of proper job completion skills. • Demonstrate techniques and skills for proper repair and replacement procedures. • Successfully complete the requirements for industry recognized manufacturer training and certifications (Forbo, Armstrong, Ardex Henry, Shaw, Mohawk, Tarkett, Nora Rubber, etc). 	<ul style="list-style-type: none"> • Identify the factors which contributed to the growth of the carpet industry. • Identify the impact the invention of tufted carpet had on the industry. • Identify which unit of measurement the total weight of carpet is measured in. • Explain the advantages and limitations of using carpet and synthetic turf. • Identify the appropriate tools to install carpet and synthetic turf.
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IUPAT/FTI

Glazier

Program Competencies

O*NET-SOC CODE: 47-2121.00

RAPIDS CODE: 0221HY

WORK PROCESS SCHEDULE
RELATED INSTRUCTION OUTLINE
Glazier

O*NET-SOC CODE: 47-2121.00 RAPIDS CODE: 0221HY

IUPAT/FTI Glazier Course Competencies

The Program level curriculum builds upon the foundation of the core curriculum skills, knowledge, and abilities. At the program level, occupation-specific standardized curriculum is designed by an ad-hoc committee comprised of the FTI Curriculum Department, IUPAT/FTI subject matter experts, employers, manufacturers, and associations.

Apprentices will be assessed on their acquisition of knowledge, skills and abilities in the core curriculum through hands-on and written tests as well as the OJL performance measures.

Additionally, the apprentices will integrate their core knowledge, skills and abilities into the pursuit of specific craft training throughout the term of their apprenticeship. This program specific training is designed to build the technical and professional skills needed by the apprentice to successfully perform his/her trade profession.

Glazier Apprenticeship Program

The Glazier Apprenticeship Program is co-sponsored by the IUPAT/FTI to meet the ever-changing needs of the industry and the affiliates it serves. The apprenticeship program ensures that apprentices will learn the theoretical knowledge and the practical skills necessary to be a successful Glazier. During this program of study, apprentices will successfully complete the IUPAT/FTI core curriculum and integrate it into the Glazier occupation specific training. Apprentices successfully completing this program apply their skills and abilities as a Glazier.

Description of Occupation

An Architectural Glass and Metal technician, called a Glazier, is responsible for selecting, cutting, installing, replacing, and removing all types of glass. Work in the glazing field includes both residential and commercial projects. Residential projects may include replacing a home's window glass to improve energy efficiency; using various techniques and materials to incorporate good weatherization strategies; installing glass mirrors, shower doors, and bathtub enclosures; and fitting glass for tabletops and display cases. Commercial interior glazing projects include installing items such as heavy, decorative room dividers or security windows. Other glazing projects may involve replacing storefront windows for establishments such as supermarkets, auto dealerships, or banks. In the construction of large commercial buildings, glaziers build metal framework extrusions and install glass panels or curtain walls.

Glass serves many uses in modern life. Insulated and specially treated glass keeps in warmed or cooled air and provides good condensation and sound control qualities, while tempered and laminated glass makes doors and windows more secure. In large commercial buildings, glass panels give office buildings a distinctive look while reducing the need for artificial lighting. The creative use of large windows, glass doors, skylights, and sunroom additions makes homes bright, airy, and inviting.

Glaziers are continuously promoting the application of green technology with the use of solar performance and sustainability in the glazing trade. The glazing trade is specifically focused on energy efficient retrofitting projects as well as the design and installation of energy efficient weatherization materials and solar technology in both residential and commercial applications.

Care must be exercised in the removal and installation of all types of glass for building fixtures and other uses. Oftentimes, the glass is precut and mounted in frames at a factory or a contractor's shop. It arrives at the jobsite ready for glaziers to position and secure it in place. Cranes and hoists with suction cups may be used to lift large, heavy pieces of glass. The work may have to be prepared either inside or outside a building, and scaffolding may be used in installations. Safe work habits are important in this occupation.

With advancements in building technology, welding skills and proper techniques are necessary to safely fasten the window system to the substrate. In order to prepare the glazier to properly perform welding techniques the glazier may be trained to the standards set forth by the American Welding Society (AWS.)

Training/Skill Set

Skills needed to become a Glazier include manual dexterity, eye-hand coordination, physical fitness, and a good sense of balance. The ability to solve arithmetic problems quickly and accurately also is required. A good work history or military service is viewed favorably by employers.

The Glazier's curriculum and training will provide the skills, knowledge, and abilities needed to meet the needs of the industry and to ensure that each worker is equipped to use the technology, materials, and applicable methods of glazing as well as adhering to all quality and safety standards on the job. Glaziers

use hand tools such as glasscutters, suction cups, and glazing knives, as well as power tools such as saws, drills, cutters, and grinders. An increasing number of Glaziers use computers in the shop or at the job site to improve their layout work and reduce the amount of glass that is wasted.

Due to improvements in the thermo capacity of modern glass, as well as increased demand for more natural light, the industry has seen an increase in the use of larger and heavier glass panels. The increased trend toward using factory glazed units means that the Glazier must increase his/her knowledge and abilities to use hoisting and rigging equipment.

Also, due to an increase in environmental concerns, there is a tendency for new structures to meet Leadership in Energy and Environmental Design (LEED) guidelines. The Glazier needs to have knowledge of high performance glazing products, solar trends, and building envelope integrity.

Glaziers learn through OJL and by working as an apprentice alongside an experienced journeyworker. This is accomplished through a combination of related instruction as delineated in these Standards.

Working Environment

Employment in the glazing trade is less seasonal than in most of the construction occupations. Such activities as replacing broken glass, making shower doors, and cutting glass for store cabinets and fixtures provide work through the year. Employment in retail outlets also tends to be stable.

Glaziers often work outdoors, sometimes in inclement weather. Their work can, at times, result in injuries as they work with sharp tools and may need to remove broken glass. They must be prepared to lift heavy glass panels and work on scaffolding, swing stages, mast climbers, and self – propelled platforms such as scissor and boom lifts; sometimes at great heights. Glaziers do a considerable amount of bending, kneeling, lifting, and standing during the installation process.

Glaziers generally work on one of several types of projects. Residential glazing involves work such as replacing glass in home windows; installing glass mirrors, shower doors, and bathtub enclosures; fitting glass for tabletops and display cases as well as energy efficient retrofits.

Commercial interior projects may require Glaziers to install items such as heavy, often etched, decorative room dividers or security windows. Glazing projects may also involve replacement of storefront windows for establishments such as supermarkets, auto dealerships, or banks. In the construction of large commercial buildings, Glaziers build metal framework extrusions and install glass panels or curtain walls. Glazing projects are focusing more and more on weatherization practices and the retrofitting and installation of new energy efficient and energy producing glazing systems.

Emphasized early in the apprentice's career is adherence to and knowledge of OSHA standards for personal safety; safety on the job site; and proper handling of tools, materials and equipment. Additionally, the apprentice will discuss safe work practices when working with glazing materials and various obstacles that may be encountered on the job, such as moving and lifting heavy or odd shaped glass and metal objects.

Additional Information/Contact

For more information about IUPAT apprenticeships or work opportunities, contact a Local of the International Union of Painters and Allied Trades, a local Joint Union-Management Apprenticeship Agency, or the nearest office of the State Employment Service or State Apprenticeship Agency.

For general information about the work and training for IUPAT, contact:



International Union of Painters and Allied Trades (IUPAT)
7234 Parkway Drive
Hanover, MD 21076
Internet: <http://www.iupat.org>



Finishing Trades Institute (FTI)
7230 Parkway Drive
Hanover, MD 21076
Internet: <http://www.finishingtradesinstitute.org/>



Labor Management Cooperative Initiative (LMCI)
7234 Parkway Drive
Hanover, MD 21076
Internet: <http://www.lmcionline.org/>



Finishing Contractors Association (FCA)
8120 Woodmont Avenue, Suite 520
Bethesda, Maryland 20814
Internet: <http://www.finishingcontractors.org>

Program Level Competencies

With reference to each of the respective areas of the Glazing trade, apprentices successfully completing this program will be able to:

Glazier

- Explore trade options as they pertain to the glazing industry.
- Examine principles of glass.
- Identify trade-related materials and applications.
- Utilize trade-related tools and equipment.
- Interpret drawings related to the glazing trade.
- Apply trade math calculations.
- Apply building controls and layout techniques.
- Demonstrate the proper fabrication, assembly, and installation methods of the glazing industry.
- Apply the standards of quality control and quality assurance in the glazing industry.
- Apply green technology as appropriate in the glazing trade.

Suggested Program of Study for the Glazier Curriculum

The IUPAT/FTI Program of Study for the Glazier OJL and RI is outlined below. Under this hybrid approach, an apprentice must participate in the indicated minimum number of hours of OJL for each category of the program. The Program Sponsor is responsible for determining the number of RI hours that an apprentice must participate in based on the FTI guidance, local needs, and the suggested minimum of 144 hours per year (29 CFR 29.5(b)(4)).

CATEGORY #	CATEGORY NAME	OJL ¹ HOURS	RTI ² HOURS
1.1-3.4	Core Curriculum	32	96
7.1	Health and Safety for the Glazing Trade	200-400	24
7.2	Introduction to the Glazing Trade	400-640	40
7.3	Sealants	80-120	40
7.4	Architectural Drawings	200-400	40
7.5	Glazing Systems, Installation and Layout	800-1200	100
7.6	Replacement Work, Retro-Fit and Weatherization	200-400	20
7.7	Skylights and Sloped Glazing	200-400	20
7.8	Energy Glazing Systems	200-400	20
7.9	Welding Applications	200-400	80
		2512-4192	480

¹ Refers to a Minimum – Maximum range of OJL hours that an apprentice must participate in during the specific apprenticeship program. An apprentice can take hands-on assessments in order to be awarded credit for these hours as determined by the District Council.

² Refers to the IUPAT/FTI suggested number of RI hours an apprentice should participate in during the specific apprenticeship program. However, the number of RI hours that an apprentice must participate in is determined by the District Council but must be a minimum of 144 hours per year..

WORK PROCESS SCHEDULE
RELATED INSTRUCTION OUTLINE
Glazier

O*NET-SOC CODE: 47-2121.00 RAPIDS CODE: 0221HY

This table identifies the course competencies that the Glazier apprentice will successfully complete.

Module 7.0 – Glazier

7.1	HEALTH AND SAFETY AWARENESS FOR THE GLAZIER	
	ON-THE-JOB LEARNING (OJL) – 200 - 400 hours	RELATED INSTRUCTION (RI) – 24 hours
	<ul style="list-style-type: none"> • Don (put on), doff (remove), inspect, and maintain the proper PPE that should be worn during glazing including, but not limited to: <ul style="list-style-type: none"> • Head • Face • Eyes • Ears • Hands • Body • Feet • Respiratory • Perform a job analysis for safe working conditions, including: <ul style="list-style-type: none"> • Attend pre-job safety meetings. • Adhere to site specific safety rules and federal regulations. • Observe Vessel Entry/Confined Space regulations. • Read and interpret MSDS. • Establish and maintain a safe working perimeter. • Maintain clean work areas (housekeeping). • Demonstrate proper and safe handling of materials and glass. • Identify the locations of First Aid and Fire Equipment. • Demonstrate basic safety awareness practices. • Demonstrate the process by which to erect and dismantle a scaffolding system. • Don and doff a personal fall arrest body harness and lanyard system. • Recognize dangerous situations that pertain to damaged 	<ul style="list-style-type: none"> • Recognize the important areas of OSHA in general terms. • Describe the role of employer, supplier, and worker in the education of safety for workers. • Identify site and job specific hazards and policies of OSHA 29CFR1926 and 29CFR1910 regulations, including: <ul style="list-style-type: none"> • Swing Stage Safety • Scaffold Erector and Dismantler • Shop Safety • Crane Safety and Hand Signals • Rigging and Hoisting • Identify the Safety Regulations as they apply to safe work practices in the glazing trade with emphasis on the importance of : <ul style="list-style-type: none"> • Identifying safety hazards (unsafe conditions) • Handling of materials, including hazardous materials • Maintenance and safe operation of tools • Selecting and using PPE • Explain the use of Material Safety Data Sheets (MSDS) for following precautions when using chemicals in the glazing trade. • Describe the precautions that must be followed when using sealants and other chemicals. • Describe the process for handling, cleaning, and storing anodized or painted aluminum finishes. • Recognize and explain the set-up and dismantling of a scaffolding system. • Recognize welder safety and working conditions and apply acceptable safety preventive measures. • Outline emergency procedures and how to obtain assistance for injured workers.

	equipment or unsafe work practices and follow proper protocol for reporting and correcting the situation.	
7.2	INTRODUCTION TO THE GLAZING TRADE	
	ON-THE-JOB LEARNING (OJL) – 400 - 640 hours	RELATED INSTRUCTION (RI) – 40 hours
	<ul style="list-style-type: none"> • Demonstrate the characteristics of a professional Glazier, including: <ul style="list-style-type: none"> • Exhibit suitable appearance and personal hygiene. • Exhibit proper attitude and behavior on job sites including private residences and other occupied buildings. • Deal with difficult customers in a professional and courteous manner. • Interpret written and verbal instructions. • Recognize the importance of cooperation and interaction with related occupations on a job site. • Demonstrate the use of glazing hand tools, including but not limited to: <ul style="list-style-type: none"> • General Tools (rules, straight edges, protractor, dividers) • Squares • Levels and Transits • Glass/Plastic Cutters • Screwdrivers • Specialty/Drill Bits and Fasteners • Caulking Guns • Knives (utility, putty, hackout) and Chisels • Glass Pliers • Metal Cutters • Hacksaws • Glass Holders • Hammers and Mallets • Pry Bars • Rivet Guns • Tap and die • Wrenches 	<ul style="list-style-type: none"> • Identify and explain basic terminology used in glazing. • Identify the historical events of the modern glazing trade. • Describe working conditions in the glazing trade. • Identify the career options and advancement opportunities in the glazing trade. • Describe at least three purposes for including windows in a building's design. • Identify the appropriate PPE needed when handling glass. • Identify hand tools used in the glazing trade. • Describe custody, care, and maintenance, of tools and equipment. • Identify symbols used in the glazing trade. • Describe the types of glass used in building construction and where they are used. • Describe the importance of load placement when moving and storing materials on a construction site. • Describe the proper technique (ergonomics) for lifting and transporting glazing materials. • Recognize the processes used on anodized or painted finishes. • Describe the purpose of the extrusion process on various types of materials (glass, aluminum, plastic, etc.). • Identify good welding applications on various joint designs and glazing finishes. • Describe the hazards associated with broken glass and its disposal. • Discuss the importance of quality workmanship when glazing aquariums, shower doors or tub enclosures. • Describe the tools, materials and safety precautions when creating art glass projects. • Discuss the importance of ensuring proper ventilation and using safety equipment when working with hazardous chemicals and materials in art glass projects.

	<ul style="list-style-type: none"> • Demonstrate the proper use of glass handling tools, materials and machinery. • Select the proper tools to safely and correctly open a case of glass. • Demonstrate the techniques used to remove, lift, carry, transport, roll and place a lite of glass on a vertical or horizontal plane. • Demonstrate the process for disposing of broken glass. • Demonstrate the process for cleaning anodized or painted aluminum. • Demonstrate auto glass replacement and repair procedures. • Demonstrate the proper use of tools, materials and safety equipment during an art glass project. 	
7.3	SEALANTS	
	ON-THE-JOB LEARNING (OJL) – 80 - 120 hours	RELATED INSTRUCTION (RI) – 40 hours
	<ul style="list-style-type: none"> • Demonstrate the techniques used to achieve good joint design. • Point out the qualities of good joint design and a properly prepared surface for sealant application. • Demonstrate methods for applying sealant on various structural glazing systems. • Demonstrate methods for sealing expansion joints. • Demonstrate knowledge of compatibility and application of membranes. 	<ul style="list-style-type: none"> • Use sealant terminology in sealant selection during course discussions and experiences. • Describe sealant forms, classifications and properties. • Describe the factors of good joint design including the basic principles of joint width and depth. • Distinguish between techniques for substrate preparations used with a variety of commonly used construction surfaces. • Describe the components, methods and applications of structural glazing systems. • Describe manufacturer's specifications for primers, solvents, and sealants used in structural glazing applications. • Describe compatibility and application of various membranes.
7.4	ARCHITECTURAL DRAWINGS	
	ON-THE-JOB LEARNING (OJL) – 200 to 400 hours	RELATED INSTRUCTION (RI) – 40 hours
	<ul style="list-style-type: none"> • Interpret and apply architectural drawings and their associated components on the job, including: <ul style="list-style-type: none"> • Blueprints • Scale rulers • Symbols and terminology • Shop drawings • Materials lists • Cutting schedules • Perimeter sheets • Optimization schedules 	<ul style="list-style-type: none"> • Describe the parts, purpose and importance of using the following on a glazing job: <ul style="list-style-type: none"> • Blueprints • Shop drawings • Specifications and schedules • Finish schedules • Contract specifications • Change notices • Site Instructions • Request for Information

	<ul style="list-style-type: none"> • Details • Contract specifications • Demonstrate the ability to make freehand sketches in a quick and efficient manner without using a compass, straight edge, or protractor. • Demonstrate how to make the following sketches: <ul style="list-style-type: none"> • Oblique drawings of straight and curved objects • Basic isometric and perspective sketches • A section of a storefront installation • A complex storefront with returns • Read a shop drawing and relate the information on it to an actual structure. • Read cross section diagrams of architectural metal extrusions to identify the following: <ul style="list-style-type: none"> • Headers • Sills, bulkheads, and sill flashing • Jambs • Mullions • Door jambs • Intermediate horizontals • Corner metal • Make a list of materials based on the shop drawing. 	<ul style="list-style-type: none"> • Request for Quotation • Read and interpret the details of blueprints, shop drawings, and perimeter sheets for the glazing trade. • Describe the differences between an oblique drawing, an isometric drawing, and a perspective drawing. • Identify the various views of a drawing that are included in a set of plans and their relationship to each other. • Identify and define material symbols, abbreviations, and lines used in drawings. • Identify type and swing of doors. • Identify a variety of windows (single, double hung, awning, casement, sliding) • Define the meaning of scale. • Use fractional rule to calculate measurements. • Explain how an architect's scale is used to measure lines. • Use the architect's scale to determine the actual length of a scaled line. • Recognize, locate, and determine missing dimensions. • Describe proper handling procedures for plans and drawings. • Identify associated materials on a set of plans such as vinyl gaskets, shims, backer rod, anchors, caulking, and setting blocks. • Explain the difference between in-shop fabrication and on-site fabrication. • Determine final measurements, taking into consideration materials used, thermal expansion, and the required coverage of the glass. • Explain the purpose of cutting and materials lists and how they are created based on shop drawings and sketches.
7.5	GLAZING SYSTEMS INSTALLATION AND LAYOUT	
	ON-THE-JOB LEARNING (OJL) – 800 - 1200 hours	RELATED INSTRUCTION (RI) – 100 hours
	<p>Glass Cutting:</p> <ul style="list-style-type: none"> • Demonstrate the basic principles and procedures for cutting glass. • Measure, mark, and score glass to specified dimensions using a glass cutter. • Demonstrate basic fabrication techniques including: edging, removing scratches, drilling and cut outs. <p>Mirrors:</p> <ul style="list-style-type: none"> • Measure the wall and transfer measurements onto a mirror. • Cut and perform edgework to various levels on glass and 	<p>Glass Cutting:</p> <ul style="list-style-type: none"> • Identify the principles and procedures for cutting glass and plastics. • Identify the various tools, materials and machinery for cutting glass. • Describe various principles and techniques for cutting glass on the job site. • Describe various glass fabrication techniques, tools, and machinery. <p>Mirrors:</p> <ul style="list-style-type: none"> • Describe the principles and procedures for light metal fabrications and installation. • Explain the importance and use of mirrors in the marketplace.

<p>mirrors using upright wet belt sanders and hand held belt sanders.</p> <ul style="list-style-type: none"> • Drill small and large holes using the proper drill for each. • Demonstrate the following glass and mirror cutouts: corner, wall outlet, peninsula notch, island circle and outside circle. • Recognize problems and apply solutions to imperfect wall surfaces to be used for mirror mounting. • Demonstrate the layout, fabrication, and installation procedures for mirror mounting. • Properly store and handle mirrors. <p>Shower Doors and Tub Enclosures:</p> <ul style="list-style-type: none"> • Demonstrate the use of hardware for shower and tub enclosures. • Measure and layout a shower and tub enclosure. • Demonstrate fabrication and installation techniques for shower and tub enclosures. <p>Doors and Locks:</p> <ul style="list-style-type: none"> • Perform a reliability test on installed panic hardware. • Demonstrate the construction and installation of aluminum doors and other entrances. <p>Handrail Systems:</p> <ul style="list-style-type: none"> • Fabricate and install a handrail system using various anchoring and securing methods. <p>Break Metal:</p> <ul style="list-style-type: none"> • Accurately measure the corners and radius walls prior to cutting the metal to insure proper fitting during installation. • Determine layout and positioning of break metal prior to cutting. • Demonstrate accurate fabrication of break metal on the job. <p>Glazing Systems (General):</p> <ul style="list-style-type: none"> • Demonstrate the ability to locate the manufacturer's installation manuals for any glazing system. • Demonstrate the ability to work with a team to fabricate and install glazing systems. • Demonstrate safe work practices and selection and use of PPE on all glazing systems. • Select and safely use the appropriate tools to install all glazing systems. • Demonstrate the proper techniques for welding various 	<ul style="list-style-type: none"> • Describe and choose the best method for installing mirrors for each job. • Identify and describe the use of hardware used for mirror mounting. • Identify different types of drills used for creating holes in glass and mirror. <p>Shower and Tub Enclosures:</p> <ul style="list-style-type: none"> • Describe the basic types of shower and tub enclosures. <p>Doors and Locks:</p> <ul style="list-style-type: none"> • Identify various types of locks and their components. • Recognize the terminology used with the function and installation of locks and bolts. • Name the basic types of panic hardware; its purpose, terminology and general installation procedures. • Discuss the requirements for door installation and construction and the effects of the environment on aluminum entrances. • Discuss the effects of positive and negative air pressure and stack effect on entrances. • Discuss the different types of automatic doors and the hardware associated. • Describe measures that can be taken to prevent the effects of temperature extremes on aluminum entrances. • Describe door size, construction and allowable clearances. • Explain the importance of following hardware guidelines on proper door installation, adjustment methods and glazing techniques. <p>Handrail Systems:</p> <ul style="list-style-type: none"> • Describe the different components of various types of handrail systems. • Describe handrail system fabrication and its anchoring and securing methods. • List the safety codes that relate to the installation of handrail systems. • Define "tolerance" as it relates to general glazing systems layout and measurements. <p>Break Metal:</p> <ul style="list-style-type: none"> • Describe the importance of measuring corners and radius walls when installing break metal. <p>Glazing Systems:</p> <ul style="list-style-type: none"> • Describe the different design qualities of Curtain wall, Unitized, Pressure Wall, Ribbon Windows, Pre-Glazed systems. • Describe the layout procedures for each of the glazing systems.
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<p>glazing systems.</p> <p>Curtain wall System:</p> <ul style="list-style-type: none"> • Measure and layout precise Curtain wall control lines and reference points. • Demonstrate the proper calculation of “tolerances” for building dimensions. • Conduct a field inspection prior to Curtain wall layout. • Demonstrate the assembly and installation of Curtain wall, including corner seals, glazing the wall and applying Curtain wall trim. <p>Ribbon Window and Pre-Glazed Systems:</p> <ul style="list-style-type: none"> • Calculate glass sizes for framed openings using elevation drawings and details. • Demonstrate the assembly and installation of Ribbon Window systems. • Demonstrate the procedures for glazing the Ribbon Window system. • Demonstrate the installation of Pre-Glazed systems. <p>Unitized System:</p> <ul style="list-style-type: none"> • Measure and layout materials needed for the installation of unitized systems. • Demonstrate the installation procedures to properly install manufacturer’s unitized system materials. • Select and safely use the appropriate tools to install all glazing systems. <p>Pressure Wall:</p> <ul style="list-style-type: none"> • Demonstrate Pressure Wall fabrication techniques. • Demonstrate the Pressure Wall erection process for single span and multi-span buildings. • Apply the steps to prepare the Pressure Wall openings for glazing. • Install glass, pressure plates, and covers on a Pressure Wall job. • Perform the procedures for internal sealants, zone damming, and water diversion. <p>Storefront Layout and Installation:</p> <ul style="list-style-type: none"> • Measure a rough opening. • Fabricate and assemble a Storefront frame that uses shear block joinery. 	<ul style="list-style-type: none"> • Describe the fabrication techniques for each of the glazing systems. • Describe the installation procedures for each of the glazing systems. • List and describe the different types of tests used to determine the correct installation of glazing systems. • Describe proper handling procedures and window material storage of each glazing system. • Compare and contrast the differences between modular, single and multiple ribbon window system units. • Identify the problems that are caused by inaccurate measurements of ribbon window systems. • Read and interpret manufacturer’s directions and architectural drawings showing placement of Ribbon Window units. • Discuss the benefits of using pre-glazed systems. • Recognize Pressure Wall terminology and components. • Identify the steps for preparing the Pressure Wall openings for glazing. <p>Storefront:</p> <ul style="list-style-type: none"> • Describe the procedures associated with internal sealants, zone damming, and water diversion. • Describe components and materials of a Storefront including headers, sills, vinyl gaskets, shims, backer rods, anchors, sealants and setting blocks. • Explain the critical importance of proper sealant selection and application in Storefront installations. • Explain the importance of accurate field measurements. <p>Spandrel Glass and Architectural Panels:</p> <ul style="list-style-type: none"> • Identify the uses of Spandrel Glass and Architectural Panels. • Describe the components of Architectural Panel systems including layout, fabrication, and installation. • Describe the components of Louver Systems including layout and installation. • Describe the different types, colors, finishes and patterns of Spandrel Glass and Architectural Panel systems. • Describe thermal stress and its causes. • Describe Architectural Panel fabrication.
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	<ul style="list-style-type: none"> • Install Storefront metal and glass for new installations. • Fabricate and assemble a canned Storefront system. • Install, level, and plumb a given Storefront frame. • Drill holes in masonry with a hammer drill or pistol drill for a given masonry anchor. • Shim and anchor a given Storefront frame. <p>Spandrel Glass and Architectural Panels:</p> <ul style="list-style-type: none"> • Demonstrate the proper fabrication of an Architectural Panel. • Demonstrate the installation of Spandrel Glass, Architectural Panels, and Louver Systems. 	
7.6	REPLACEMENT, RETRO-FIT, AND WEATHERIZATION	
	ON-THE-JOB LEARNING (OJL) – 200 - 400 hours	RELATED INSTRUCTION (RI) – 20 hours
	<ul style="list-style-type: none"> • Demonstrate the safe removal and disposal of broken glass. • Demonstrate the techniques for re-glazing various window systems. 	<ul style="list-style-type: none"> • Identify and use the proper safety equipment and procedures. • Identify and describe the various types of replacement and retro-fit windows.
7.7	SKYLIGHTS AND SLOPED GLAZING	
	ON-THE-JOB LEARNING (OJL) – 200 - 400 hours	RELATED INSTRUCTION (RI) – 20 hours
	<ul style="list-style-type: none"> • Demonstrate self-flashing curb and curb mount skylight mountings. • Demonstrate the use and installation of various kinds of fall protection. • Demonstrate safe handling practices for skylights. • Compare the dimensions and tolerances of the skylight support structure with dimensions on skylight shop drawings. • Demonstrate the assembly of skylight components. • Demonstrate the use of various glazing and skylight hand tools. • Troubleshoot and repair problems with tools, materials, layout, leaks and other installation inefficiencies. • Demonstrate caulking and anchoring techniques. 	<ul style="list-style-type: none"> • Describe the use and purpose of skylights in both residential and commercial architecture. • Identify the types of loads to which skylights may be exposed and explain the importance of adhering to the design of a sky lighting system. • Discuss the various types of glass and their strength and response to impact, thermal stress and movement, breakage and water or moisture. • Discuss fall protection, including anchor points, hardware options, safety nets, load, and scaffolds. • Describe safe practices for handling skylights and materials including scissor and boom lifts. • Describe safe installation methods including how to avoid walking on the glass. • Describe the use of shop drawings for identifying components and materials for installation. • Describe the assembly procedures and considerations for a given skylight. • Identify skylight hand tools and materials.
7.8	ENERGY GLAZING SYSTEMS (EGS)	

	ON-THE-JOB LEARNING (OJL) – 200 - 400 hours	RELATED INSTRUCTION (RI) – 20 hours
	<ul style="list-style-type: none"> • Demonstrate the proper fabrication of various EGS. • Demonstrate the proper installation of various EGS. • Demonstrate safe work practices and appropriate PPE when working with EGS. • Demonstrate proper material handling and installation with particular emphasis on the pigtail. 	<ul style="list-style-type: none"> • Explain how EGS gather, store, and re-produce energy. • Explain how EGS benefit property owners in regard to sustainability and the green initiative. • List and identify parts and components of various EGS. • Identify various EGS manufacturers' specifications for fabrication and installation. • Define and discuss a pigtail and its care and handling. • Describe how to handle and store photovoltaic (PV) panels.
7.9	WELDING APPLICATIONS	
	ON-THE-JOB LEARNING (OJL) – 200 - 400 hours	RELATED INSTRUCTION (RI) – 80 hours
	<ul style="list-style-type: none"> • Operate the shielded metal arc welding process in all positions to AWS D1.1 acceptance criteria (stick). • Demonstrate how to manipulate the electrode to produce certain weld characteristics. • Operate the oxy fuel cutting process. • Operate the plasma arc cutting process • Tack up weldments. • Weld single and multipass fillet welds in all positions using the Shielded Metal Arc Welding process. • Weld Groove welds in the flat, horizontal, vertical and overhead positions using the shielded metal arc welding process to given specifications. • Use Shielded Metal Arc Welding to produce stringer beads and weave beads in the flat and vertical positions. • Repair faulty fillet weld areas containing undercut, overlap, uneven fillet weld legs and undersized fillet welds. • Produce stringer beads and weave beads in the flat and vertical positions. • Demonstrate oxygen fuel cutting techniques to sever metals. 	<ul style="list-style-type: none"> • Define welding and list common welding processes. • Identify industries and applications where welding processes are performed. • Recognize welder safety and working conditions and apply acceptable safety preventative measures. • List personal protective equipment and identify attire that is sufficient in coverage and materials known to minimize skin burns caused by sparks, spatter, or radiation. • Identify welding types, joint design, and positions used in welded construction. • Interpret common welding symbols as established by the American Welding Society. • Identify arc welding procedures, equipment, and materials with safety. • Define basic terminology associated with the welding trade.

IUPAT/FTI

Hydro Blaster/Vacuum Technician

Program Competencies

O*NET-SOC CODE: 53-7061.00

RAPIDS CODE: 1110HY

WORK PROCESS SCHEDULE
RELATED INSTRUCTION OUTLINE
Hydro Blaster/Vacuum Technician
O*NET-SOC CODE: 53-7061.00 RAPIDS CODE: 1110HY

IUPAT/FTI Hydro Blaster/Vacuum Technician Course Competencies

The Program level curriculum builds upon the foundation of the core curriculum skills, knowledge, and abilities. At the program level, occupation-specific standardized curriculum is designed by an ad-hoc committee comprised of the FTI Curriculum Department, IUPAT/FTI subject matter experts, employers, manufacturers, and associations.

Apprentices will be assessed on their acquisition of knowledge, skills and abilities in the core curriculum through hands-on and written tests as well as OJL performance measures.

Additionally, the apprentices will integrate their core knowledge, skills and abilities into the pursuit of specific occupational training throughout the term of their apprenticeship. This program specific training is designed to build the technical and professional skills needed by the crafts person to successfully perform his or her trade profession.

Hydro Blaster/Vacuum Technician Apprenticeship Program

The Hydro Blaster/Vacuum Technician Apprenticeship Program is a new offering co-sponsored by the IUPAT and FTI to meet the ever-changing needs of the industry and the affiliates it serves. The new apprenticeship program ensures that apprentices will learn the theoretical knowledge and the practical skills necessary to be a successful Hydro Blaster/Vacuum Technician. During this program of study, apprentices will successfully complete the IUPAT/FTI core curriculum and integrate it into the Hydro Blaster/Vacuum Technician occupation specific training. Apprentices successfully completing this program apply their skills and abilities as Hydro Blasters and Vacuum Technicians.

Description of Occupation

Hydro Blaster/Vacuum Technician transports, performs set-up, inspects, operates, maintains & repairs high pressure water blasting equipment and industrial vacuuming equipment to perform proper removal, containment, transporting, and disposal of both hazardous and non-hazardous materials for the purpose of cleaning.

Additional Information/Contact

For more information about IUPAT apprenticeships or work opportunities, contact a Local of the International Union of Painters and Allied Trades, a local Joint Union-Management Apprenticeship Agency, or the nearest office of the State Employment Service or State Apprenticeship Agency.

For general information about the work and training for IUPAT, contact:



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Labor Management Cooperative Initiative (LMCI)
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Finishing Contractors Association (FCA)
8120 Woodmont Avenue, Suite 520
Bethesda, Maryland 20814
Internet: <http://www.finishingcontractors.org>

Program Level Competencies

With reference to each of the respective areas of the Hydro Blaster/Vacuum Technician trade, apprentices successfully completing this program will be able to:

Hydro Blaster/Vacuum Technician

- Explain and demonstrate the safe and proper set-up of the hydro blasting equipment.
- Explain and demonstrate the operation and recognition of precise performance of the hydro blasting equipment.
- Explain and apply the most effective and safe methodology in transporting hydro blasting equipment.
- Recognize and repair hydro blasting equipment in a manner that will ensure safety, maximum performance, and prevent down time.
- Explain and apply the most effective and safe methodology in vacuuming with extremely powerful and dangerous equipment in various settings and conditions.
- Recognize and repair the problems that are associated with extremely powerful Vacuum Systems.
- Complete the state requirements for a Commercial Drivers License (C.D.L.) minimum Class B with Hazmat Endorsement, Air Brake Endorsement and Tanker Endorsement.

Suggested Program of Study for the Hydro Blaster/Vacuum Technician Curriculum

The IUPAT/FTI Program of Study for the Hydro Blaster/Vacuum Technician OJL and Related Instruction is outlined below. Under this hybrid approach, an apprentice must participate in the indicated minimum number of hours of OJL for each category of the program. The Program Sponsor is responsible for determining the number of RI hours that an apprentice must participate in based on the FTI guidance, local needs, and the suggested minimum of 144 hours per year (29 CFR 29.5(b)(4)).

CATEGORY #	CATEGORY NAME	OJL¹ HOURS	RTI² HOURS
1.1-3.4	Core Curriculum	32	96
8.1	Health and Safety Awareness	320-480	16
8.2	Introduction to Hydro Blasting Trade	320-400	16
8.3	Hydro Blasting Equipment	560-640	24
8.4	Hydro Blasting Techniques	560-640	24
8.5	Hydro Blasting Maintenance	160-400	16
8.6	Vacuum Technician Techniques	560-640	40
8.7	Vacuum Technician Maintenance	160-400	40
8.8	C.D.L. Class B with HAZMAT Endorsement	320-400	40
		2992-4032	312

¹ Refers to a Minimum – Maximum range of OJL hours that an apprentice must participate in during the specific apprenticeship program. An apprentice can take hands-on assessments in order to be awarded credit for these hours as determined by the District Council.

² Refers to the IUPAT/FTI suggested number of RI hours an apprentice should participate in during the specific apprenticeship program. However, the number of RI hours that an apprentice must participate in is determined by the District Council but must be a minimum of 144 hours per year.

WORK PROCESS SCHEDULE
 RELATED INSTRUCTION OUTLINE
 Hydro Blaster/Vacuum Technician
 O*NET-SOC CODE: 53-7061.00 RAPIDS CODE: 1110HY

This table identifies the Hydro Blaster/Vacuum Technician course competencies that the apprentices will complete to work successfully as a Hydro Blaster/Vacuum Technician.

Module 8.0 – Hydro Blaster/Vacuum Truck Technician

8.1	HEALTH AND SAFETY AWARENESS	
	On-the-Job Learning (OJL) – 320 - 480 hours	Related Instruction (RI) – 16 hours
	<ul style="list-style-type: none"> • Don (put on), doff (remove), inspect, and maintain the proper PPE that should be worn during hydro blasting/vacuumping including, but not limited to: <ul style="list-style-type: none"> • Head • Face • Eyes • Ears • Hands • Body • Feet • Respiratory • Perform a job analysis for safe working conditions: <ul style="list-style-type: none"> • Attend pre-job safety meetings • Adhere to site specific safety rules and federal regulations • Observe Vessel Entry/Confined Space regulations • Read and understand MSDS • Maintain the recommended operating pressure of the job scope • Establish and maintain a safe working perimeter • Safely demonstrate the proper use and maintenance of hydro blasting/vacuumping equipment including, but not limited to: <ul style="list-style-type: none"> • Mechanical System Safety • Electrical System Safety • Pump Safety • Fitting Safety • Hose Safety 	<ul style="list-style-type: none"> • List the proper PPE that should be worn during hydro blasting. • Recognize unsafe job site conditions. • Explain the importance of maintaining and using equipment safely. • Identify the nature of hydro blasting injuries. • Identify the proper medical procedures associated with hydro blasting injuries. • Define the key terms relating to Hazardous Waste. • Explain the operations that are covered by the HAZWOPER standard (the scope of the standard). • Compare and contrast the characteristics of a confined space with those of a permit-required confined space. • Identify 29 CFR 1910.146 as OSHA’s General Industry Confined Spaces Rule. • Describe the qualifications of a competent Aerial/Scissor Lift Operator. • Classify environmental hazards and related safety precautions, including fall protection, for aerial/scissor lift operations. • Describe the responsibilities, warning and instructions of the operator when working on an aerial platform. • Identify types of scissor lifts; their components and operations.

	<ul style="list-style-type: none"> • Surface Cleaning • Tube Cleaning • Lance Safety • Vehicle Safety <ul style="list-style-type: none"> • Administer the proper medical procedures associated with hydro blasting/vacuuuming injuries. 	
8.2	INTRODUCTION TO THE HYDRO BLASTING TRADE	
	On-the-Job Learning (OJL) – 320 - 400 hours	Related Instruction (RI) – 16 hours
	<ul style="list-style-type: none"> • Identify and explain the basic terminology used in the hydro blasting trade. • Apply the concepts of pressure, flow rate, and velocity as they pertain to the hydro blasting trade. • Identify and explain the components of the hydro blasting system, including: <ul style="list-style-type: none"> • Set-up, operation, delivery, and shut-down • Roles and responsibilities of the hydro blasting team. • Differentiate between the four basic categories of hydro blasting, including: <ul style="list-style-type: none"> • Low Pressure Water Washing • High Pressure Water Washing • High Pressure Hydro blasting • Ultra High Pressure Hydro blasting 	<ul style="list-style-type: none"> • Explain the concepts of pressure, flow rate, and velocity as they pertain to the hydro blasting trade. • Explain the historical significance of the hydro blasting trade. • Define hydro blasting and recognize the four categories of hydro blasting. • Identify the applications in which hydro blasting is used. • Determine the advantages and limitations of hydro blasting. • Identify and explain the basic terminology used in the hydro blasting trade.
8.3	HYDROBLASTING EQUIPMENT	
	On-the-Job Learning (OJL) – 560 - 640 hours	Related Instruction (RI) – 24 hours
	<ul style="list-style-type: none"> • Identify and explain the various components and operations of the hydro blasting system, including: <ul style="list-style-type: none"> • Power (Drive) Units • Diesel • Gas • Propane, etc. • Identify and explain the various components and operations of the hydro blasting system, including: <ul style="list-style-type: none"> • Pumps • Crankshaft (power end) • Piston (fluid end) • Identify and explain the various components and operations of the hydro blasting system (valves), including: <ul style="list-style-type: none"> • Dump Valve 	<ul style="list-style-type: none"> • Identify the various components of the hydro blasting system. • Perform daily inspections to identify problems with equipment. • Apply the operational productivity procedures identified by industry standards.

	<ul style="list-style-type: none"> • Changeover Valve • Relief Valve • Identify and explain the various components and operations of the hydro blasting system, including: <ul style="list-style-type: none"> • Hoses • Feed Hose • Lead Hose • Work Hose • Identify and explain the various components and operations of the hydro blasting system: <ul style="list-style-type: none"> • Guns • Dump • Dry Shut-off • Lance (Flex and Rigid) • Identify and explain the various components and operations of the hydro blasting system: <ul style="list-style-type: none"> • Nozzles • Rotating • Non-Rotating • Fan or zero-degree • Self-propelled or air-propelled • Single orifice • Multiple orifice, up to 5 tips • Perform daily inspections to insure safe operation of hydro blasting equipment. • Apply the operational productivity procedures identified by industry standards. • Identify potentially hazardous chemicals, materials and conditions and the requirements for loading and unloading the truck. 	
8.4	HYDRO BLASTING TECHNIQUES	
	On-the-Job Learning (OJL) – 560 - 640 hours	Related Instruction (RI) – 24 hours
	<ul style="list-style-type: none"> • Recognize an example of a pre-service and operational checklist for high pressure water cleaning. • List and demonstrate, in the correct order, the proper pre-operating procedures used in hydro blasting, including: <ul style="list-style-type: none"> • Pre-job Planning • Area Limits • Hook-up 	<ul style="list-style-type: none"> • Recognize an example of a pre-service and operational checklist for high pressure water cleaning. • List and demonstrate, in the correct order, the pre-operating procedures used in hydro blasting. • List and demonstrate, in the correct order, the operating procedures used in hydro blasting. • List and demonstrate, in the correct order, the operating

	<ul style="list-style-type: none"> • List and demonstrate, in the correct order, the proper safe operating procedures used in hydro blasting, including: <ul style="list-style-type: none"> • Start up • Operational Check • Tightening and Adjusting Components • Equipment Malfunction • Reaction Force • Operating Pressure and Orifice Selection • Effect of Pressure Change • Operator Position • Use of Balanced Nozzle Orifices • Procedures for Entering the Working Area • Additional Protection • Protective Equipment • Pressurizing the System • Demonstrate the proper safe operating procedures for the following hydro blasting techniques: <ul style="list-style-type: none"> • Shot gunning • Line Moleing • Flex Lancing • Rigid Lancing • Stationary Oscillating Head 	<p>procedures used in hydro excavation.</p>
8.5	HYDRO BLASTING MAINTENANCE	
	<p>On-the-Job Learning (OJL) – 160 - 400 hours</p> <ul style="list-style-type: none"> • Inspect and perform routine and scheduled maintenance checks as recommended by the manufacturer’s specifications on the following components of the hydro blasting system, including: <ul style="list-style-type: none"> • Power (Drive) Unit • Pressure Pump • Water Inlet, Reservoir, and Booster Pumps • Filters and Strainers • Hose Assemblies • Nozzles • Guns <ul style="list-style-type: none"> • Lance Connections • Trigger and Valve Controls • Foot Control Valves • Electrical Equipment 	<p>Related Instruction (RI) – 16 hours</p> <ul style="list-style-type: none"> • Inspect and perform daily maintenance checks on all components of the system. • Perform routine inspections of all external and internal parts of valves, fittings and gun components of the system. • Provide scheduled servicing to the pump and major components of the system.

	<ul style="list-style-type: none"> • Electrical boxes • Connections • Switches • Cables, and • Fittings • Rupture (Bursting) Discs • Trailers <ul style="list-style-type: none"> • Use only the tools and parts recommended by the manufacturer for assembling and disassembling high pressure components. • Inspect all components of a high pressure water jet system to make sure they are of the correct size, thread, and pressure rating for the use intended (Compatibility). • Adhere to the manufacturer's recommendations for circulating antifreeze through the system's water lines. 	
8.6	VACUUM TECHNICIAN TECHNIQUES	
	On-the-Job Learning (OJL) – 560 - 640 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Identify and explain the basic terminology used in the Vacuum Truck Technician trade. • Demonstrate the proper operating procedures used in vacuuming including: <ul style="list-style-type: none"> • Hoses are properly routed • Safety Tees are properly installed • Vacuum equipment is working properly • Vehicle is properly grounded • Work areas are properly barricaded • Apply the concepts of pressure and vacuum as they pertain to the vacuuming trade. • Identify and explain the various components and operations of the Vacuum Truck including, but not limited to: <ul style="list-style-type: none"> • Technician Control Panel • Vacuum Pump • Primary Shut-Off Trap • Secondary Moisture Trap • Oil Catch Muffler • Manway (Access Panel) • Vacuum Relief Valve • Pressure Relief Valve • Pressure/Vacuum Gauge • Oil Reservoir 	<ul style="list-style-type: none"> • Explain the history of Pressure Truck and Vacuum and its applications • Define the basic terminology and training requirements associated with the Vacuum Technician trade. • Identify the components of the Pressure Truck and Vacuum. • Identify the appropriate Personal Protective Equipment used in the Vacuum Truck trade. • List and demonstrate, in correct order, the pre-operating procedures used in vacuuming. • Identify potentially hazardous chemicals, materials and conditions and the requirements for loading and unloading the truck. • List and demonstrate, in correct order, the general operating procedures used in vacuuming.

	<ul style="list-style-type: none"> • Pre-filter • Oil Separator • Silencer • Exhaust Interceptor • Vacuum Tank (Carbon Steel, Aluminum, and Stainless Steel). • Identify the various types of vacuum trucks and their applications, including: <ul style="list-style-type: none"> • Dry Vacuum Truck • Wet Vacuum Truck • Combination (Dry/Wet) Vacuum Truck • Hydro Excavator • List and demonstrate, in correct order, the pre-operating procedures used in vacuuming, including: <ul style="list-style-type: none"> • Planning • Checklists • Hoses, Pipes, and Fittings Preparation • Electrical Equipment Preparation and Safety • Grounding • Review of MSDS • List and demonstrate, in correct order, the general operating procedures used in vacuuming according to the manufacturers' recommendations, including: <ul style="list-style-type: none"> • Starting the Truck Engine • Driving the Truck • Field Set-up • Position Hose and Safety Tee • Test Equipment and Safety Devices • Vacuum Loading Procedures • Material Disposal (including transporting materials) • Adhere to the appropriate safety procedures used in Vacuum Truck operations: <ul style="list-style-type: none"> • Truck Mechanical Requirements • Gross Vehicle Weight Rating (GVWR) • Personnel Proximity to Truck • Liquid Vacuum Truck Safety • Overhead Obstacles • Underground Issues 	
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	<ul style="list-style-type: none"> • Uneven/Unstable Ground Conditions • Pedestrians • Higher Center of Gravity • Parking • Dumping of Truck Contents 	
8.7	VACUUM TECHNICIAN MAINTENANCE	
	On-the-Job Learning (OJL) – 160 - 400 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Inspect and perform routine and scheduled maintenance checks as recommended by the manufacturers' specifications on the following components of the Vacuum Truck: <ul style="list-style-type: none"> • Pre-Operational <ul style="list-style-type: none"> • Planning • Company Provided Checklists • Inspect Vehicles • Obtain and Inspect Tools and Equipment are in proper working condition • Obtain and Inspect PPE • Operational <ul style="list-style-type: none"> • Proper shut-down procedures • Gather all tools and equipment • Clean all tools and equipment • Clean up project work site • Inspect vehicles prior to return trip • Closeout all project paperwork • Identify the proper use of tools and equipment for repairing vacuum truck equipment. • Recognize when the vacuum truck equipment is in need of maintenance and notify the appropriate supervisor. 	<ul style="list-style-type: none"> • Recognize when the vacuum truck equipment is in need of routine maintenance and servicing prior to, during and following operation. • Identify and perform the appropriate types (daily, interval, and scheduled) of routine maintenance and servicing of the vacuum truck equipment. • Identify the proper use of tools and equipment used for repairing vacuum truck equipment. • Recognize when the vacuum truck equipment is in need of advanced maintenance. • Perform the appropriate advanced maintenance based on the manufacturer's recommendations.
8.8	C.D.L CLASS B WITH HAZMAT ENDORSEMENT	
	On-the-Job Learning (OJL) – 320 - 400 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Perform the vehicle inspection process of a commercial vehicle, including: <ul style="list-style-type: none"> • Pre-trip (checklists) • On the road • Post-trip vehicle and equipment inspections (checklists) • Demonstrate basic operating skills of a commercial vehicle. • Successfully pass the State Department of Motor Vehicles 	<ul style="list-style-type: none"> • Explain the vehicle inspection process of a commercial vehicle. • Demonstrate basic control skills of a commercial vehicle. • Successfully pass the State Department of Motor Vehicles Examination for a C.D.L. Class B with Hazmat Endorsement. • Identify and explain the safety procedures; alcohol and drug effects; laws and penalties that are applicable to the commercial driver.

	<p>Examination for a C.D.L. Class B with Hazmat Endorsement.</p> <ul style="list-style-type: none"> • Identify and explain the safety procedures; alcohol and drug effects; laws and penalties that are applicable to the commercial driver. • Demonstrate at a proficient level with regard to performing pre-trip, on the road, and post-trip vehicle and equipment inspections and sliding fifth-wheels and tandems. • Demonstrate the ability to be skillful in safe driving techniques. • Demonstrate proficient skills in map reading, trip planning, maintaining a log book, cargo documentation, coupling and uncoupling, and be aware of emergency responsibilities and regulations of transportation agencies. 	<ul style="list-style-type: none"> • Demonstrate at a proficient level with regard to performing pre-trip, on the road, and post-trip vehicle and equipment inspections and sliding fifth-wheels and tandems. • Demonstrate the ability to be skillful in safe driving techniques. • Demonstrate proficient skills in map reading, trip planning, maintaining a log book, cargo documentation, coupling and uncoupling, and be aware of emergency responsibilities and regulations of transportation agencies.
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IUPAT/FTI

Painter-Decorator (Painter Construction)

Program Competencies

O*NET-SOC CODE: 47-2141.00

RAPIDS CODE: 0379HY

WORK PROCESS SCHEDULE
RELATED INSTRUCTION OUTLINE
Painter-Decorator (Painter Construction)
O*NET-SOC CODE: 47-2141.00 RAPIDS CODE: 0379HY

IUPAT/FTI Painter - Decorator Course Competencies

The Program level curriculum builds upon the foundation of the core curriculum skills, knowledge, and abilities. At the program level, occupation-specific standardized curriculum is designed by an ad-hoc committee comprised of the FTI Curriculum Department, IUPAT/FTI subject matter experts, employers, manufacturers, and associations.

Apprentices will be assessed on their acquisition of knowledge, skills and abilities in the core curriculum through hands-on and written tests as well as OJL performance measures.

Additionally, the apprentices will integrate their core knowledge, skills and abilities into the pursuit of specific occupational training throughout the term of their apprenticeship. This program specific training is designed to build the technical and professional skills needed by the apprentice to successfully perform his/her occupational profession.

Painter-Decorator Apprenticeship Program

The Painters and Decorators Apprenticeship Program is an educational program co-sponsored by the IUPAT and FTI to meet the ever-changing needs of the industry and the affiliates it serves. The apprenticeship program ensures that apprentices will learn the theoretical knowledge and the practical skills necessary to be successful Painters and Decorators.

During the course of study, apprentices will be exposed to labor union history with special emphasis on the IUPAT, health and safety issues, materials, tools, equipment, and the proper techniques of the Painting and Decorating trade.

Apprentices successfully completing this program apply their skills and abilities as Painters and Decorators in residential, commercial, institutional, and industrial settings.

Description of Occupation

Painter-Decorator – Painters and Decorators apply decorative and protective finishes in residential, commercial, institutional and industrial settings. They prepare a variety of surfaces (wood, masonry, drywall, plaster, concrete, synthetics, stucco and metal) prior to the application of materials such as paint, high performance coatings, waterproofing, fireproofing, varnish, shellac, wall coverings and special decorative finishes.

Painters and Decorators are employed by construction companies, painting contractors, building maintenance contractors, or are self-employed. They work on projects such as home interiors and exteriors, residential high rises, wall covering work, industrial tanks and plants, bridges, airports, institutions, marine and offshore projects, and other commercial and industrial projects. Some Painters and Decorators may work for years on a single site; others may work for contractors that rarely work on the same site more than once.

Trends in the industry are leading manufacturers to continually make their products more environmental friendly. Environmental concerns have encouraged a movement toward 100% solid materials (low or no VOCs). The industry is on the cutting edge of the use of intumescent coatings in industrial settings. High performance emulsion paints and varnishes have vastly improved in their durability and overall performance. They have also become more environmentally and user-friendly. Ceramic insulating paints are fairly new to the trade. These paints were first introduced in the industrial sector, but are now being used for residential applications as well. The use of these paints for homes is expected to rise because of the increasing awareness of energy efficiency.

Work Environment

Painters and Decorators may come in contact with hazardous materials such as isocyanates, free silica, lead, volatile organic compounds and at times, carcinogenic materials. They may work with some physical discomfort when preparing surfaces or applying coatings in awkward positions. Painters and Decorators may work indoors and/or outdoors.

Painters and Decorators need to be aware of the safety and environmental concerns involved in the use of occupation equipment. For example, high and ultra high water jetting equipment and other types of abrasive blasting equipment are used to strip paint from building, tanks, bridges, ships, and piping. When working on tall buildings, painters erect scaffolding, including "swing stages," scaffolds suspended by ropes, or cables attached to roof hooks. When painting steeples and other conical structures, they use a Bosun's chair, a swing-like device.

Painters and Decorators must stand for long periods, often working from scaffolding and ladders. Their

jobs also require a considerable amount of climbing and bending. These workers must have stamina, because much of the work is done with their arms raised overhead. Painters often work outdoors but seldom in wet, cold, or inclement weather. Some painting jobs can leave a worker covered with paint.

Training/Skill Set

Key attributes for people entering this trade are manual dexterity, excellent color and artistic aptitude. Good physical condition is important because the work often requires considerable standing, kneeling, and repetitive activities such as brushing and rolling.

Painters and Decorators must have an eye for detail, the ability to plan work, and knowledge of many types of finishes, their properties and their applications. Painters and Decorators must be able to calculate areas and relate such calculations to required material. Good communications and customer service skills are required by Painters and Decorators who often interact with home/business owners, contractors, interior designers and architects.

Basic computer skills are gradually becoming a necessary occupational skill for communications, research and design. Due to technological advances in the industry, ongoing training in new materials and their applications is critical to Painter and Decorators.

Most painters and decorators learn through OJL and by working as an apprentice to an experienced journeyworker. This is accomplished through a combination of related instruction as delineated in these Standards.

Additional Information/Contact

For more information about IUPAT apprenticeships or work opportunities, contact a Local of the International Union of Painters and Allied Trades, a local Joint Union-Management Apprenticeship Agency, or the nearest office of the State Employment Service or State Apprenticeship Agency.

For general information about the work and training for IUPAT, contact:



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Program Level Competencies

With reference to each of the respective areas of the Painter-Decorator occupation, apprentices successfully completing this program will be able to:

Painter-Decorator Occupation

- Explore historical aspects of Painting and Decorating and its relevance to current applications.
- Explore trade options as they pertain to the Painting and Decorating industry.
- Examine principles of Painting and Decorating.
- Identify materials and applications of the Painting and Decorating industry.
- Utilize tools and equipment of the Painting and Decorating industry.
- Interpret drawings related to the Painting and Decorating trade.
- Apply trade math calculations.
- Apply the standards of quality control and quality assurance in the Painting and Decorating industry.

Suggested Program of Study for the Painter-Decorator Curriculum

The IUPAT/FTI Program of Study for the Painter-Decorator OJL and Related Instruction is outlined below. Under this hybrid approach, an apprentice must participate in the indicated minimum number of hours of OJL for each category of the program. The Program Sponsor is responsible for determining the number of RI hours that an apprentice must participate in based on the FTI guidance, local needs, and the suggested minimum of 144 hours per year (29 CFR 29.5(b)(4)).

CATEGORY #	CATEGORY NAME	OJL¹ HOURS	RI² HOURS
1.1-3.4	Core Curriculum	32	96
9.1	Health and Safety Awareness for the Painter-Decorator	300 - 500	40
9.2	Introduction to the Painting and Decorating Trade	800 - 1000	60
9.3	Surface Preparation and Cleaning	800 - 1000	40
9.4	Non-spray Application of Coatings	800 - 1000	60
9.5	Identifying Paints, Coatings, and Materials	400 - 600	24
9.6	Spray Painting	800 - 1000	48
9.7	Wood Finishes	160-480	16
9.8	Wall coverings	160-480	16
9.9	Abrasive Blasting	160-480	16
9.10	Decorative Finishes	160-480	16
		4572 - 7052	432

¹ Refers to a Minimum – Maximum range of OJL hours that an apprentice must participate in during the specific apprenticeship program. An apprentice can take hands-on assessments in order to be awarded credit for these hours as determined by the District Council.

² Refers to the IUPAT/FTI suggested number of RI hours an apprentice should participate in during the specific apprenticeship program. However, the number of RI hours that an apprentice must participate in is determined by the District Council but must be a minimum of 144 hours per year.

WORK PROCESS SCHEDULE
 RELATED INSTRUCTION OUTLINE
 Painter-Decorator (Painter Construction)
 O*NET-SOC CODE: 47-2141.00 RAPIDS CODE: 0379HY

This table identifies the course competencies that the Painter-Decorator apprentice will successfully complete.

Module 9.0 – Painter-Decorator

9.1	HEALTH AND SAFETY AWARENESS	
	On-the-Job Learning (OJL) – 300 - 500 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Don (put on), doff (remove), inspect, and maintain the proper PPE that should be worn during painting and decorating application including, but not limited to: <ul style="list-style-type: none"> • Head • Face • Eyes • Ears • Hands • Body • Feet • Respiratory • Perform a job analysis for safe working conditions: <ul style="list-style-type: none"> • Attend pre-job safety meetings • Adhere to site specific safety rules and federal regulations • Observe Vessel Entry/Confined Space regulations • Read and interpret MSDS • Establish and maintain a safe working perimeter • Safely demonstrate the proper use and maintenance of tools and equipment. • Maintain clean work areas (housekeeping). • Demonstrate how to perform positive and negative fit checks on selected respirators. • Use selected monitoring equipment to measure the atmosphere in a confined space. • Recognize the symptoms associated with excess exposure to heat and cold. • Store, handle, and transport tools, equipment and materials 	<ul style="list-style-type: none"> • Recognize the important areas of OSHA in general terms. • Identify the Safety Regulations as they apply to safe work practices in the trade with emphasis on: <ul style="list-style-type: none"> • Identification of safety hazards (unsafe conditions) • Proper handling of materials, including hazardous • Maintenance and safe operation of tools • PPE • Describe the precautions that must be followed when using flammable liquids and adhesives. • Explain the purpose of Hazard Communication programs. • Explain what a Material Safety Data Sheet (MSDS) is, its purpose and limitation. • Describe the role of employer, supplier, and worker in the education of workers. • Outline emergency procedures and how to obtain assistance for injured workers. • Compare and contrast the characteristics of a confined space with those of a permit-required confined space. • Explain confined space characteristics and hazards. • Identify 29 CFR 1910.146 as OSHA’s General Industry Confined Spaces Rule. • Describe the proper technique (ergonomics) for lifting and transporting CAS materials and equipment. • Identify safety requirements for erecting and dismantling scaffolds, including: pre-planning, inspecting scaffold components, calculating load capacity, platform construction, access requirements, and fall protection. • Identify the different types of aerial lifts and their related safety rules and

	<p>properly.</p> <ul style="list-style-type: none"> • Identify the locations of First Aid and Fire Equipment. • Correctly use fall arresting and other fall protection equipment. • Demonstrate safe work practices for erecting and dismantling scaffolds, including: pre-planning, inspecting scaffold components, load capacity, platform construction, access requirements, and fall protection. • Demonstrate a pre-inspection and the safe operation of an aerial lift. • Describe and demonstrate the proper use of various types of personal fall protection equipment. • Describe and demonstrate the steps of ladder safety, including: selection, inspection, set-up, safe techniques and proper maintenance and storage. 	<p>precautions.</p> <ul style="list-style-type: none"> • Describe potential fall hazards in the workplace. • Describe the different types of ladders and the conditions under which they are used. • Describe the techniques and equipment used for environmental humidity/temperature control.
9.2	INTRODUCTION TO THE PAINTING AND DECORATING TRADE	
	On-the-Job Learning (OJL) – 800 - 1000 hours	Related Instruction (RI) – 60 hours
	<ul style="list-style-type: none"> • Demonstrate the characteristics of a professional Painter-Decorator, including: <ul style="list-style-type: none"> • Exhibit suitable appearance and personal hygiene. • Exhibit proper attitude and behavior on the job site, including private residences and other occupied buildings. • Deal with difficult customers in a professional and courteous manner. • Interpret written and verbal instructions. • Recognize the importance of cooperation and interaction with related trades on a job site. • Demonstrate the knowledge and use of color theory and the color wheel by selecting and applying complimentary, contrasting, and harmonious colors. • Recognize the importance of cooperation and interaction with related trades on a job site. <ul style="list-style-type: none"> • Setup and safely operate a compressor. • Setup and safely use a power washer on multiple substrates. • Demonstrate the proper use of a Pasting Table. • Demonstrate how to clean and store brushes and rollers. • Identify and select the proper brush and roller given a 	<ul style="list-style-type: none"> • Identify and explain the basic terminology used in the Painting and Decorating trade. • Describe the working conditions of the Painting and Decorating trade. • Identify the career options and advancement opportunities in the Painting and Decorating trade. • Describe custody, care, and maintenance of tools and equipment. • Identify basic tools and equipment used for surface preparation and Painting and Decorating application. • Identify the reasons for applying coatings. • Identify the basic hand tools and equipment used in the Painting and Decorating trade. • Identify power tools used in Painting and Decorating trade. • Identify the basic hand tools and equipment used in the Drywall Trade. • Identify the basic hand tools and equipment used in the Wall covering trade. • Identify the equipment required for proper lighting of a worksite. • Identify the proper methods, procedures and equipment used for proper ventilation. • Identify different types and use of work platforms. • Identify the components of brushes and rollers. • Describe the differences between natural bristles and synthetic bristles. • Recognize the various types of paint brushes and select the proper paint

	<p>particular application.</p> <ul style="list-style-type: none"> • Demonstrate the selection and use of masking methods, tools and materials. • Demonstrate proper layout drop cloths, & plastic. • Demonstrate the proper use of spray shielding. • Demonstrate knowledge of wrapping methods and materials. • Demonstrate the proper clean up, removal and disposal of protective materials used in masking operations. • Recognize and describe the application of selected masking materials. • Demonstrate/describe selected methods and materials for interior/exterior coverings. • Demonstrate how to properly mask a window with tape and paper/plastic. • Demonstrate how to spray railings. • Demonstrate how to cover from overspray. <ul style="list-style-type: none"> • Demonstrate how to remove masking tape after finish coats have been applied. 	<p>brush for the application.</p> <ul style="list-style-type: none"> ▪ Wall brushes ▪ Varnish brushes ▪ Sash and trim brushes ▪ Stain brushes ▪ Special purpose brushes ▪ Decorative brushes ▪ Recognize the different kinds of rollers and roller covers and select the proper roller and cover for the application, including: <ul style="list-style-type: none"> • Dip rollers • Self-feeding rollers • Special purpose rollers. • Identify and describe masking tools and materials. • Describe the materials required for protecting surfaces, including: <ul style="list-style-type: none"> • Tape dispensers • Types of tape • Types of masking material • Paint shields • Covering materials • Describe the methods of applying interior and exterior masking and coverings to various surfaces. • Understand the importance of proper cleanup. • Describe how to protect shrubbery during the painting process. • Describe how windscreens work. • Describe the importance of using drop cloths when spraying near roofs. • Describe the dangers of masking exterior light fixtures.
9.3	SURFACE PREPARATION AND CLEANING	
	On-the-Job Learning (OJL) – 800 - 1000 hours	Related Instruction (RI) – 40 hours
	<ul style="list-style-type: none"> • Demonstrate various surface preparation methods. • Demonstrate various substrate repair methods. • Demonstrate various inspection test devices. • Sand, wash, caulk, spackle and spot prime previously painted substrates in preparation for repainting. • Sand, prime, putty and caulk wood surfaces in preparation for finish coat. • Prepare new and old porous masonry surfaces for coatings. • Prepare metal substrates for coatings by utilizing selected surface prep methods. • Prepare substrate for sealant. 	<ul style="list-style-type: none"> • Identify selected substrates and surfaces and suitable methods of surface prep. • Recognize and identify industry standard surface prep methods and specifications. • Identify the ramifications of improper surface prep. • Recognize and describe the various categories and uses of low-pressure water washing equipment. • Recognize the different types of joints and substrates. • Explain the implications of using chemical strippers, and solvents as related to VOC's and health hazards. • Identify the classifications and uses of chemicals as related to surface

	<ul style="list-style-type: none"> • Estimate curing and drying times based on various ambient conditions. • Demonstrate proper start-up, operation, cleaning techniques, shutdown, and safety guidelines for typical low-pressure washers using selected accessories. • Demonstrate proper surface prep operations utilizing chemical strippers and deglossers on both new and previously painted surfaces. • Patch and finish damaged drywall. • Sand, wash, caulk, spackle and spot prime new substrates in preparation for painting. • Demonstrate basic knowledge of various surface prep inspection tools and equipment. • Demonstrate ability to repair common paint failures using various methods of surface preparation prior to repainting operation. • Recognize and describe the uses of various preparation agents. <ul style="list-style-type: none"> • Demonstrate the proper use of Drywall Finishing hand and automatic tools. • Demonstrate embedding of drywall joints, angles, corner bead and nail spotting. • Properly prepare each type of compound in use on a job. • Demonstrate the application of the second drywall coat. • Demonstrate the application of the finish coat and touch up, including the use of sanding tools. • Apply textures by hand and automated methods to perform the following tasks: <ul style="list-style-type: none"> • Joint taping and finishing • Fastener spotting • Corner finishing • Sanding • Demonstrate the ability to patch and finish damaged drywall. • Distinguish and state a level of finish by observation. 	<ul style="list-style-type: none"> • prep operations. • Describe substrate preparation tools and materials. • Identify materials used in drywall finishing and state the purpose and use of each of the following materials: <ul style="list-style-type: none"> • Compounds • Joint reinforcing tapes • Trim materials • Textures and Coatings • Explain the differences in the six levels of finishing established by industry standards. • Identify the hand tools used in Drywall Finishing. • Identify taping and bedding materials. • Describe some of the problems and causes that occur in drywall finishes.
9.4	NON-SPRAY APPLICATION OF COATINGS	
	On-the-Job Learning (OJL) – 800 - 1,000 hours	Related Instruction (RI) – 60 hours
	<ul style="list-style-type: none"> • Apply coating (Paint, Lining, Stain, Wood Finishes, Sealers 	<ul style="list-style-type: none"> • Explain the various methods and best practices in the application of

	<p>etc...) to selected surfaces using the following methods:</p> <ul style="list-style-type: none"> • Brush • Roller • Trowel or other hand tool <ul style="list-style-type: none"> • Properly clean and store hand tools and equipment, using correct solvents. • Properly dispose of waste; paint, water, solvents, etc. • Demonstrate the ability to mix single and multi component paint, coatings, and linings. • Demonstrate the techniques for proper application of coating on various substrates. • Demonstrate the proper selection and use of hand tools required for a coating project. • Demonstrate the procedures for painting each of the following: double hung window, casement window, gutters and downspouts. • Demonstrate the procedures for painting exterior doors. • Demonstrate the procedures for painting fixed and movable shutters. 	<p>stain, clear coat, and wood finish application on wood substrates.</p> <ul style="list-style-type: none"> • Identify characteristics of concrete coating application. • Explain the effects of using various coatings and coating methods as related to VOC's, environmental and health concerns. • Understand the differences and unique characteristics of various substrates and their unique coating requirements, i.e., open and closed grain wood, concrete, metallic substrates, drywall, etc. • Identify common brushes used to paint window trim. • Describe various methods of painting gutters and downspouts. • Describe how to paint roll up garage doors. • Describe the procedures for painting exterior doors. • Describe the advantages and disadvantages of various clear finishes for exterior doors.
9.5	IDENTIFYING PAINTS, COATINGS AND MATERIALS	
	On-the-Job Learning (OJL) – 400 - 600 hours	Related Instruction (RI) – 24 hours
	<ul style="list-style-type: none"> • Properly select a product based on service area and use. • Demonstrate the procedure for creating a custom tint. • Utilize various waterproofing coating systems on both horizontal and vertical surfaces. • Demonstrate the general methods used for the clean up and disposal of water-based and oil-based paints. • Demonstrate the proper selection of primers, paints and stains for various residential or commercial applications. 	<ul style="list-style-type: none"> • Identify coatings and solvents by type and compatibility (Latex/Water, Alkyd/Mineral Spirits, etc). • Identify composition of coating products and the various chemicals contained in a volume of coating. • Understand the components of a Product Data Sheet and the Material Safety Data Sheet for a product. • Identify common paint failures, causes and their correction. • Understand Green technology as it relates to paint and coating technology. • Identify ways that color and/or light can influence a person's mood. • Be able to explain how Theoretical Spread rate relates to % solids by Volume. • Explain the use of sealants, fillers, coatings, weather-stripping and other material as a component of weatherization procedures. • Explain the functions of pigments, resins, solvents, and additives. • Describe the basic differences between water-based and oil-based paints and coatings. • Describe the properties and functions of paints or coatings.

Comment [h1]: Will they be explaining percentages, if so, the word should be spelled out?

		<ul style="list-style-type: none"> • Identify the recommended method of surface preparation for different types of coatings. • Describe the application and interaction of various paint materials on selected residential/commercial surfaces. • Identify the equipment used to prepare, apply and maintain painted surfaces in a residential or commercial setting. • Describe the importance of primers when painting the exterior of commercial or residential buildings. • Identify commonly used exterior coatings, stains, and primer stain blockers.
9.6	SPRAY PAINTING	
	On-the-Job Learning (OJL) – 800 - 1,000 hours	Related Instruction (RI) – 48 hours
	<ul style="list-style-type: none"> • Demonstrate the ability to safely apply paints and coatings to various substrates with conventional and HVLP spray systems. • Demonstrate the ability to properly clean conventional and HVLP spray systems. • Demonstrate the ability to properly clean airless and air assisted spray systems. • Demonstrate proper utilization of inspection tools, and equipment prior to, during, and after spray operations. • Properly dispose of waste; paint, water, solvents etc. within acceptable environmental, regulatory and job specific guidelines. • Display proper spray application technique and adjustment of equipment to produce a quality finish with minimal waste and overspray. • Demonstrate ability to properly maintain spray equipment. • Demonstrate how to properly mix paint in preparation for spray painting. • Demonstrate how to use each type of spray equipment to properly apply paint to selected surfaces. • Perform cleaning and maintenance on spray equipment per the manufacturer's instructions. • Demonstrate how to measure the thickness of wet and dry paint films. • Demonstrate how to measure the viscosity of paints and coatings. • Demonstrate accurate measurements and angle calculation when striping a parking lot. 	<ul style="list-style-type: none"> • Identify conventional and HVLP spray equipment components. • Identify airless and air assisted spray equipment components. • Recognize advantages and disadvantages of various spray equipment and accessories given various substrates and materials. • Understand the basics of specialty spray systems including electrostatic, plural component, hopper, and thermal spray. • Explain differences in interior and exterior spray application and the challenges of each. • Recognize and describe spray systems and components, including: <ul style="list-style-type: none"> • Conventional spray • Airless and air-assisted • HVLP spray systems • Explain the responsibilities of a striper in parking lot layouts, including design factors such as traffic flow, number of users, exits/entry, and vehicle size. • Identify striping tools, materials and application methods and practices. • Describe striping equipment and substrate preparation.

	<ul style="list-style-type: none"> • Demonstrate striping application methods using the proper tools and practices. • Demonstrate the preparation of pavement for receiving striping. • Demonstrate the use of conventional and airless spray systems during striping. 	
9.7	WOOD FINISHES	
	On-the-Job Learning (OJL) – 160 - 480 hours	Related Instruction (RI) – 16 hours
	<ul style="list-style-type: none"> • Recognize hardwoods and softwoods. • Recognize open-grain and closed-grain woods. • Use a moisture meter to measure the moisture content of selected wood surfaces. • Demonstrate proper hand and power tool sanding techniques and cleaning of selected wood substrates. • Use bleach to lighten selected wood substrates. • Apply fillers to selected open-grained substrates. • Apply a sealer to selected wood substrates. • Apply stains to selected interior/exterior substrates. • Apply clear finishes to selected wood substrates. <ul style="list-style-type: none"> • Varnish • Lacquer • Shellac • Polyurethane 	<ul style="list-style-type: none"> • Explain why wood should be finished. • Describe the characteristics of wood. • Recognize open-grain and closed-grain wood surfaces. • Name and describe the use of basic wood finishing materials. • Demonstrate and/or describe the steps that are involved in the wood finishing process. <ul style="list-style-type: none"> • Sanding and cleaning • Bleaching • Staining • Filling • Sealing • Applying finish coat(s)
9.8	WALL COVERINGS	
	On-the-Job Learning (OJL) – 160 to 480 hours	Related Instruction (RI) – 16 hours
	<ul style="list-style-type: none"> • Estimate the amount of wall covering needed using various estimating techniques. • Select the proper adhesive for a particular wall covering. • Properly mix a powdered adhesive. • Prepare a surface for wall covering. • Install selected wall coverings and borders with emphasis on working around windows, doors, light fixtures, and other obstacles. • Demonstrate the ability to install wall coverings in difficult places such as stairs, slant walls, dormers, and archways. • Recognize and correct common wall covering failures. • Correctly apply a variety of wall coverings using the proper technique when confronted with doors, windows, dormers, 	<ul style="list-style-type: none"> • Identify the basic types of wall coverings, their characteristics, and uses. • Identify the types and categories of commercial wall coverings. • Understand the terms associated with wall covering. • Identify the tools, equipment, adhesives, and other materials commonly used to install wall coverings.

	archways, and other architectural elements.	
9.9	ABRASIVE WET BLASTING	
	On-the-Job Learning (OJL) – 160 to 480 hours	Related Instruction (RI) – 16 hours
	<ul style="list-style-type: none"> • Demonstrate abrasive blasting system operations including guidelines: warnings and hazards, pre-start, daily checks, start-up, operation, and shutdown. • Demonstrate the use proper use of a conventional abrasive blast system. • Demonstrate the selection of a properly fitting blast nozzle and holder. • Demonstrate basic safety in the operation of a conventional abrasive blast system. • Create a surface that meets industry standards defining an achievable surface cleanliness level. 	<ul style="list-style-type: none"> • Describe the basic uses of conventional abrasive blast systems. • Recognize and describe the types and sizes of basic blast machines and the functions of their components. • Describe the requirements of air and blast hose and hose couplings. • Describe the types and sizes of blast nozzles and holders. • Describe the basic safety and operating guidelines for conventional blast systems.
9.10	DECORATIVE FINISHES	
	On-the-Job Learning (OJL) – 160 to 480 hours	Related Instruction (RI) – 16 hours
	<ul style="list-style-type: none"> • Apply stippling and mottling finishes to properly prepared surfaces. • Apply a grained finish to a properly prepared surface. • Recognize the type of decorative finish on any surface. • Demonstrate how to prepare surfaces for application of different decorative finishes. • Use the proper tools needed to achieve special effects when applying different decorative finishes. • Prepare oil-based and water-based glazes. • Demonstrate how to make common glaze formulas (recipes). • Apply glaze coats to properly prepared surfaces using sponging, rag rolling, and cheese clothing. • Apply a marbled finish to a properly prepared surface. • Apply antiqued finishes to a properly prepared surface using methods such as rubbing with steel wool and spattering. 	<ul style="list-style-type: none"> • Explain the purpose for using each type of decorative finish. • Recognize surfaces with decorative finishes applied by glazing. • Demonstrate how to make common glaze formulas (recipes). • Recognize surfaces with decorative finishes applied by antiquing. • Recognize surfaces with decorative finishes applied by gilding. • Recognize surfaces with decorative finishes applied by stippling and mottling, and describe the difference between the two methods. • Recognize surfaces with decorative finishes applied by marbling and graining, and describe the difference between the two methods. • Demonstrate and/or describe how to prepare surfaces for application of the different types of decorative finishes. • Use the proper tools needed to achieve special effects when applying different types of decorative finishes. • Identify the decorative colors commonly used in marbling and graining.

Glossary of Acronyms

AED	Automated External Defibrillator
AWS	American Welding Society
CDL	Commercial Driver's License
CPR	Cardiopulmonary Resuscitation
EIFS	Exterior Insulation and Finishing System
EPA	Environmental Protection Agency
EPS	Expanded Polystyrene
ESD	Electrostatic Discharge
GVWR	Gross Vehicle Weight Rating
HAZ COM	Hazardous Communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
HUD	Housing and Urban Development
HVAC	Heating, Ventilating, and Air Conditioning
HVLP	High-volume, Low Pressure
J-BAR	Johnson Bar
LED	Light-emitting Diode
LEED-NS	Leadership in Energy and Environmental Design – New Construction
MDO	Medium Density Overlay
MSDS	Material Safety Data Sheet
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
PV	Photovoltaic
PVC	Polyvinyl Chloride
RRP	Renovation, Repair and Painting
STP	Supervisory Training Program
TWP	Top Workplace Performance
VCT	Vinyl Composition Tile
VOC	Volatile Organic Compound