

**[Note: The combined Core Curriculum Program Competencies and Industrial Coating and Lining Application Specialist Program Competencies provide the information requested in items 6, 7 and 8 of the Occupational Standards portion of the USDOL/ETA “Apprenticeability Determination Form.”]**

# **Painter, Industrial Coating and Lining Application Specialist**

**IUPAT/FTI**

**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 occupations will be exposed to a uniform body of theoretical knowledge and practical skills needed to be a successful journeyworker 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 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 journeyworker or apprentice to successfully perform his/her occupation.

## **Core Curriculum Program Competencies**

Apprentices successfully completing an occupational 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 occupation related tools and equipment.
- Interpret drawings related to the finishing trades.
- Apply occupational math calculations on the job.
- Demonstrate sustainable/green building design awareness on all construction sites and in all occupational 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 RI is outlined below. Under this hybrid occupation, an apprentice must participate in the indicated minimum number of hours of OJL for each category of the occupation. 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 MINIMUM HOURS	RI MINIMUM 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 students 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	<b>HISTORY OF IUPAT (LABOR HISTORY)</b> <b>Related Instruction (RI) – 4 hours</b> <ul style="list-style-type: none"><li>• Identify the historical reasons for unionization.</li><li>• Describe the strengths and weaknesses of the labor movement in the U.S.</li><li>• Describe the union structure and its activities.</li><li>• Explain how unions promote the occupation and serve its members</li><li>• Understand the union’s impact on economic issues, corporation, productivity, and distribution of wealth.</li><li>• Identify and explain the most significant labor laws of the 1900s.</li><li>• Analyze the impact the labor movement has had on social and political reform.</li><li>• Evaluate the IUPAT’s role in the labor movement from 1887 to the Present.</li></ul>
1.2	<b>On-the-Job Learning (OJL) – 16 hours</b> <ul style="list-style-type: none"><li>• Demonstrate the characteristics of a professional in the occupation.</li><li>• Participate in union-related activities.</li></ul> <b>SURVIVAL OF THE FITTEST (SOF)</b> <b>Related Instruction (RI) – 2 hours</b> <ul style="list-style-type: none"><li>• Investigate the current state of the union’s market share.</li><li>• Discuss the personal rewards and consequences associated with the union’s market share.</li><li>• Describe successful strategies for unions to regain a market share in the construction industry.</li><li>• Identify and describe what the union provides on an ongoing basis to its members and affiliates.</li><li>• Identify the roles and responsibilities of the end users, contractors, union, and rank and file.</li><li>• Articulate the value that the union provides its members and affiliates.</li><li>• Describe the impact the IUPAT’s Top Workplace Performance (TWP) program has on shaping attitudes and performance.</li><li>• Discuss the generational changes in rank and file attitudes and behaviors.</li></ul>
1.3	<b>On-the-Job Learning (OJL)</b> <b>GREEN BUILDING AWARENESS</b> <b>Related Instruction (RI) – 4 hours</b>

- This is a classroom-based module, there is no OJL assessment.

- 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.
- 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 Leadership in Energy and Environmental Design – New Construction (LEED-NC) Process.

#### 1.4

##### **On-the-Job Learning (OJL)**

- This is a classroom-based module, there is no OJL assessment.

#### **SEXUAL HARASSMENT**

##### **Related Instruction (RI) – 2 hours**

- 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 Industrial Coating and Lining Application Specialist (ICLAS) cases.
- Identify United States Supreme Court Landmark ICLAS cases.

#### 1.5

##### **On-the-Job Learning (OJL)**

- This is a classroom-based module, there is no OJL assessment.

#### **MATH FOR CONSTRUCTION TRADES**

##### **Related Instruction (RI) – 12 hours**

- 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 industry.
- 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

### **On-the-Job Learning (OJL)**

- This is a classroom-based module, there is no OJL assessment.

### **BASIC COMPUTING**

#### **Related Instruction (RI) – 4 hours**

- 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

### **On-the-Job Learning (OJL)**

- Locate occupational information using blueprints.
- Answer basic construction questions related to the layout and installation of materials at the jobsite.

### **ARCHITECTURAL DRAWINGS/BLEUPRINT READING**

#### **Related Instruction (RI) – 16 hours**

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

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

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

### Module 3.0 – Leadership and Professional Development

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

**IUPAT/FTI**

**Painter, Industrial Coating and Lining  
Application Specialist**

**Program Competencies**

**O\*NET-SOC CODE: 47-2141.00  
RAPIDS CODE: 2009HY**

**WORK PROCESS SCHEDULE  
RELATED INSTRUCTION OUTLINE  
Painter, Industrial Coating and Lining Application Specialist  
O\*NET-SOC CODE: 47-2141.00 RAPIDS CODE: 2009HY**

**IUPAT/FTI Painter, Industrial Coating and Lining Application Specialist (ICLAS)  
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 or journeyworker to successfully perform his or her profession.

**Painter, Industrial Coating and Lining Application Specialist Apprenticeship Program**

The Painter, Industrial Coating and Lining Application Specialist 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 students will learn the theoretical knowledge and the practical skills necessary to become a certified Painter, Industrial Coating and Lining Application Specialist. During this program of study, students will successfully complete the IUPAT/FTI core curriculum and integrate it into the Painter, Industrial Coating and Lining Application Specialist specific training. Apprentice's successfully completing this program may apply their skills and abilities as Painter, Industrial Coating and Lining Application Specialist.

**Description of Occupation**

**Painters, Industrial Coating and Lining Application Specialists** apply techniques to prepare substrates for coating and lining application. Techniques may include removal of rust, mill scale and previously applied hazardous coatings utilizing industry-specific tools and techniques.

Painters, Industrial Coating and Lining Application Specialists apply/install protective coatings and linings to steel and concrete on complex structures, such as bridges and towers; waterfront structure, such as locks and dams, ship hulls, offshore platforms, bulkheads, and piers; metal and manufacturing facilities; chemical and processing facilities (e.g. food processing; pulp and paper mills; food and beverage plants; water and wastewater processing facilities); and conventional and nuclear power generation facilities.

By the nature of their work, Painters, Industrial Coating and Lining Application Specialists often work in dangerous environments such as bridges high over waterways, other highways or railroads, or in confined spaces such as shipboard spaces, small vessels or storage tanks. Because of this, Painters, Industrial Coating and Lining Application Specialists are required to receive more specialized training in health and safety due to the hazards associated with their work. See Attached SSPC Guide 17.

In today's environmentally-conscious culture, the Painter, Industrial Coating and Lining Application Specialist must also be careful to protect the environment surrounding the jobsite to ensure that hazardous debris such as lead-based paint and abrasive blasting media is properly contained and disposed of according to stringent federal, state and local regulations. This often requires the rigging of intricate containment systems and work platforms.

Apprentices will learn to apply their theoretical knowledge and skills to the corrosion protection of steel and concrete on complex industrial structures through course work in Health and Safety Awareness for Application Specialists, surface preparation and coating materials properties, and application. Specialty application course work in plural component and thermal spray will further assist students in expanding their skills. Apprentices will have their capabilities verified thru the IUPAT/FTI Painter, Industrial Coating and Lining Application Specialist Certification Program.

The objective of the Certification Program is to determine, through proctored written and practical examination, whether an individual journeyworker has the skill and knowledge to perform quality surface preparation and protective coatings application. The ICLAS program meets this need and provides criteria for the education, training, experience, knowledge, and motor skills required to prepare and apply protective coatings to steel and concrete surfaces of complex industrial and marine structures.

This training and certification has been designed to meet the requirements for a Level II certified Painter, Coating and Lining Application Specialist set forth in the Body of Knowledge contained within the SSPC ACS 1/NACE No.13 Joint Standard and in accordance with ISO 17024.

Apprentices shall be required to maintain their Qualifications per the requirements set forth in the SSPC ACS 1/NACE No. 13 Joint Standards.

### **Program Level Competencies**

With reference to each of the respective areas of the Painter, Industrial Coating and Lining Application Specialist occupation, apprentices successfully completing this program will be able to:

#### ***Painter, Industrial Coating and Lining Application Specialist Occupation***

- Identify types of corrosion and select coatings that meet project demands in various conditions and service environments.
- Apply proper surface preparation techniques to achieve the maximum level of protection available through protective coatings systems.
- Create a surface that meets industry standards defining an achievable surface cleanliness level.
- Demonstrate the ability to apply a coating properly through spray application; and troubleshoot spray pattern problems.
- Recognize jobsite deviations and nonconformities and identify how they may be addressed.
- Describe the requirements for writing and following written procedures and the difference between quality control and quality assurance.

### **Suggested Program of Study for the Painter, Industrial Coating and Lining Application Specialist Curriculum**

The IUPAT/FTI Program of Study for the Painter, Industrial Coating and Lining Application Specialist OJL and Related Instruction (RI) is outlined below. Under this hybrid occupation, 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)).

<b>CATEGORY #</b>	<b>CATEGORY NAME</b>	<b>OJL HOURS</b>	<b>RI HOURS</b>
1.1-3.4	Core Curriculum	32	96
4.1	Health and Safety Awareness for the Industrial Coating and Lining Application Specialist	300 - 500	40
4.2	Introduction to Industrial Coatings	350 - 450	32
4.3	Materials and Corrosion	600 - 800	40
4.4	Surface Preparation	850 - 950	60
4.5	Spray Applications	600 - 850	92
4.6	Coatings	1000 - 1200	96
4.7	Specialty Applications	650 - 850	80
4.8	Contractor Quality Management	250 - 400	40
		4632- 6032	576

**WORK PROCESS SCHEDULE  
RELATED INSTRUCTION OUTLINE  
Painter, Industrial Coating and Lining Application Specialist  
O\*NET-SOC CODE: 47-2141.00 RAPIDS CODE: 2009HY**

This table identifies the course competencies that the Painter, Industrial Coating and Lining Application Specialist (ICLAS) apprentice will successfully complete.

**Module 4.0 – Painter, Industrial Coating and Lining Application Specialist**

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

	<ul style="list-style-type: none"> <li>• Identify the locations of First Aid and Fire Equipment.</li> <li>• Correctly use fall arresting and other fall protection equipment.</li> <li>• Demonstrate safe work practices for erecting and dismantling scaffolds, including: pre-planning, inspecting scaffold components, load capacity, platform construction, access requirements, and fall protection.</li> <li>• Demonstrate a pre-inspection and the safe operation of an aerial lift.</li> <li>• Describe and demonstrate the proper use of various types of personal fall protection equipment.</li> <li>• Describe and demonstrate the steps of ladder safety, including: selection, inspection, set-up, safe techniques and proper maintenance and storage.</li> <li>• Use flags and paddles to safely control vehicle movements around work zones in accordance with state and national guidelines.</li> <li>• Demonstrate the measurement of a selected containment ventilation air pressure and/or air flow requirement using the appropriate instrumentation.</li> <li>• Recognize and describe a selected emission quality assessment method.</li> <li>• Perform and explain the procedures for conducting forklift inspections.</li> <li>• Calculate load weight and determine forklift capabilities for that load.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the different types of ladders and the conditions under which they are used.</li> <li>• Understand the requirements to protect the driving public and work zone crew at and around construction and maintenance areas (or work zones).</li> <li>• Describe a containment system (classes, enclosure components and methods, ventilation components and methods, emission assessment methods, and worker and equipment decontamination facilities).</li> <li>• Describe the techniques and equipment used for environmental humidity/temperature control.</li> <li>• Describe the qualifications of a competent Forklift Operator.</li> <li>• Explain the laws, regulations, and elevation precautions that apply to forklift operations.</li> </ul>
<b>4.2</b>	<b>INTRODUCTION TO INDUSTRIAL COATINGS</b>	
	<b>On-the-Job Learning (OJL) – 350 - 450 hours</b>	<b>Related Instruction (RI) – 32 hours</b>
	<ul style="list-style-type: none"> <li>• Demonstrate the characteristics of a professional Painter, Industrial Coating and Lining Application Specialist: <ul style="list-style-type: none"> <li>• Exhibit suitable appearance and personal hygiene.</li> <li>• Exhibit proper attitude and behavior on the jobsite, including private residences and other occupied buildings.</li> <li>• Deal with difficult customers in a professional and courteous manner.</li> <li>• Interpret written and verbal instructions.</li> <li>• Recognize the importance of cooperation and</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Identify and explain the basic terminology used in the industrial coatings field.</li> <li>• Describe the working conditions of the industrial coatings field.</li> <li>• Identify the career options and advancement opportunities in the industrial coatings field.</li> <li>• Describe custody, care, and maintenance of tools and equipment.</li> <li>• Describe the need for Painter, Industrial Coating and Lining Application Specialist and Industry recognized certification in the Industrial Painting Industry.</li> <li>• Identify basic tools and equipment used for surface preparation and</li> </ul>

	<p>interaction with related occupations on a jobsite.</p> <ul style="list-style-type: none"> <li>• Demonstrate the ability to follow specific work place protocol and procedures.</li> </ul>	<p>coatings application.</p> <ul style="list-style-type: none"> <li>• Compare and contrast the Industrial Coatings Industry to the Commercial and Residential Painting Industry.</li> <li>• Understand the history of bridges and the different types of bridges.</li> <li>• Identify and define the components of the structures that comprise a bridge.</li> </ul>
<b>4.3</b>	<b>MATERIALS AND CORROSION</b>	
	<b>On-the-Job Learning (OJL) – 600 - 800 hours</b>	<b>Related Instruction (RI) – 40 hours</b>
	<ul style="list-style-type: none"> <li>• Recognize the critical role of the applicator in providing protection from corrosion.</li> <li>• Recognize the 8 basic forms of corrosion.</li> <li>• Demonstrate the 5 basic methods of mitigating corrosion.</li> <li>• Select conditions that meet project demands in various conditions and service environments.</li> <li>• Set-up of a jobsite including selection of trailers, storing flammable liquids, waste thinner, hazardous lead waste, and tarps.</li> <li>• Demonstrate the ability to tie knots correctly and understand the different types of knots used in Industrial applications.</li> <li>• Store, handle, and transport tools, equipment and materials properly.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify tools of the occupation.</li> <li>• Explain how and why corrosion occurs.</li> <li>• Identify and describe the 8 basic forms of corrosion and how to properly mitigate using proper techniques such as use of hand tools, power tools, and blast media.</li> <li>• Identify and describe the 5 basic methods of mitigating corrosion.</li> <li>• Explain how coatings are used to control corrosion.</li> <li>• Identify paint coat sequence of proper application procedures (primer, second coat, and finish coat).</li> <li>• Explain the environmental concerns associated with Industrial Coating materials.</li> </ul>
<b>4.4</b>	<b>SURFACE PREPARATION</b>	
	<b>On-the-Job Learning (OJL) – 850 - 950 hours</b>	<b>Related Instruction (RI) – 60 hours</b>
	<ul style="list-style-type: none"> <li>• Apply proper surface preparation techniques to achieve the maximum level of protection available through protective coatings systems.</li> <li>• Create a surface that meets industry standards defining an achievable surface cleanliness level.</li> <li>• Demonstrate the safe and appropriate application of surface preparation techniques: <ul style="list-style-type: none"> <li>• Solvent cleaning</li> <li>• Hand tool cleaning</li> <li>• Power tool cleaning</li> <li>• Water jetting</li> <li>• Chemical stripping</li> <li>• Abrasive blast cleaning</li> <li>• Vacuum blast cleaning</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Identify and describe various surfaces, substrates, and rust grades per SSPC Visual Standards and definitions.</li> <li>• Describe common methods of surface preparation and the conditions in which they are applied.</li> <li>• Explain abrasive blasting system operation guidelines: warnings and hazards, pre-start, daily checks, start-up, operation, and shutdown.</li> <li>• Recognize the importance of steel surface preparation.</li> <li>• Identify the effects of mass, velocity, air volume and pressure, nozzle, and hose size on abrasive blasting.</li> <li>• Identify and document initial condition of steel.</li> <li>• Identify the Standards for: <ul style="list-style-type: none"> <li>• Dry abrasive blasting</li> <li>• Power and hand tools</li> <li>• Wet abrasive blasting</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• Centrifugal blast cleaning</li> <li>• Sodium bicarbonate blast cleaning</li> <li>• Sponge jetting</li> <li>• Carbon dioxide blast cleaning</li> <li>• Laser removal</li> <li>• Demonstrate and describe the proper use, maintenance and storage of surface preparation tools and equipment.</li> <li>• Demonstrate solvent hand tool cleaning, safety, PPE, methods, care, and repair SSPC – SP1.</li> <li>• Demonstrate power tool safety, PPE, methods of use, standards, and inspection SSPC – SP3.</li> <li>• Demonstrate the proper set-up of compressor, blast pot, and separators with control valves, hose and coupling layout.</li> <li>• Demonstrate abrasive blasting system operation guidelines: warnings and hazards, pre-start, daily checks, start-up, operation, and shutdown.</li> <li>• Create a surface that meets industry standards defining an achievable surface cleanliness level.</li> <li>• Demonstrate the proper use, care, PPE, and inspection of water cleaning and water jetting.</li> <li>• Recognize and describe surface preparation of concrete in accordance with SSPC – SP13/NACE 6.</li> <li>• Measure ambient conditions.</li> <li>• Determine when to measure ambient conditions.</li> <li>• Recognize when coating operations should not be permitted due to adverse ambient conditions.</li> <li>• Identify and employ troubleshooting techniques and procedures.</li> </ul>	<ul style="list-style-type: none"> <li>• Water cleaning and water jetting</li> <li>• Identify the acceptable abrasive blasting conditions (dew point, temperature, relative humidity, dehumidification, wind, and surface temperature).</li> <li>• Identify and describe the materials, equipment, and methods for chemical cleaning and high pressure and ultra high pressure water jetting SSPC – SP12/NACE 5.</li> <li>• Explain what and how ambient conditions affect application and coating performance.</li> <li>• Identify the primary elements of a nozzle blast cleaning system.</li> <li>• Discuss how abrasive characteristics affect: <ul style="list-style-type: none"> <li>• Cleaning levels</li> <li>• Surface profile</li> <li>• Productivity</li> <li>• Recyclability</li> <li>• Dust</li> <li>• Waste generation</li> </ul> </li> </ul>
<b>4.5</b>	<b>SPRAY APPLICATIONS</b>	
	<b>On-the-Job Learning (OJL) – 600 - 850 hours</b>	<b>Related Instruction (RI) – 92 hours</b>
	<ul style="list-style-type: none"> <li>• Demonstrate proper spray techniques for each of the spray systems and troubleshoot spray pattern problems.</li> <li>• Demonstrate proper care and maintenance of spray equipment.</li> <li>• Demonstrate appropriate use and safe handling of spray equipment.</li> <li>• Recognize, select, and demonstrate the following equipment for coating application:</li> </ul>	<ul style="list-style-type: none"> <li>• Describe basic conventional air and airless spray systems, including variations of each: Conventional (air), Airless, Air-assisted, High-volume, Low-pressure, Electrostatic and Plural-component.</li> <li>• Identify by name, the parts of a spray gun and their functions.</li> <li>• List the procedures required to clean and lubricate a spray gun.</li> <li>• Identify the conditions under which each spray system may be used.</li> <li>• Define and use the proper terms for describing spray techniques and equipment.</li> </ul>

	<ul style="list-style-type: none"> <li>• Brushes and rollers</li> <li>• Conventional sprayers</li> <li>• Airless and air-assisted airless sprayers</li> <li>• High-volume, low-pressure (HVLP) sprayers</li> <li>• Electrostatic sprayers</li> <li>• Plural component proportioning equipment</li> <li>• Wire flame and wire arc sprayers</li> <li>• Dry powder coating application processes</li> <li>• Demonstrate thermo spraying methods, i.e., wire flame, powder flame, electric arc and plasma.</li> <li>• Demonstrate safe and proper methods to mix paint.</li> <li>• Demonstrate proper use of wet film thickness gauge.</li> <li>• Demonstrate the procedures required to clean and lubricate a spray gun.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain the relevance of coating terms; dry time, cure time and overcoat time.</li> <li>• Recognize, select, and demonstrate the following equipment for coating application: <ul style="list-style-type: none"> <li>• Brushes and rollers</li> <li>• Conventional sprayers</li> <li>• Airless and air-assisted airless sprayers</li> <li>• High-volume, low-pressure (HVLP) sprayers</li> <li>• Electrostatic sprayers</li> <li>• Plural component proportioning equipment</li> <li>• Wire flame and wire arc sprayers</li> <li>• Dry powder coating application processes</li> </ul> </li> <li>• Recognize and describe applicable hazards and safety guidelines for the above mentioned equipment. Recognize and describe proper storage conditions.</li> <li>• Define pot life, induction time, and recoat window and explain their importance.</li> <li>• Explain the methods used to obtain proper DFT and WFT with and without thinning.</li> </ul>
<b>4.6</b>	<b>COATINGS</b>	
	<b>On-the-Job Learning (OJL) – 1,000 - 1,200 hours</b>	<b>Related Instruction (RI) – 96 hours</b>
	<ul style="list-style-type: none"> <li>• Demonstrate proper use of wet film thickness gauge.</li> <li>• Demonstrate quality inspection procedures for monitoring ambient air, surface temperature, and surface profile.</li> <li>• Interpret manufacturer's catalog product data sheets to determine recommended uses and product/performance characteristics for industrial coatings.</li> <li>• Use MSDSs to determine the hazards, appropriate personal protective equipment, and other safety-relevant information pertaining to the use of industrial coatings.</li> <li>• Use manufacturer's coating application bulletins to determine the proper surface preparation and application procedures required for use with industrial coatings.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify the three basic mechanisms of corrosion control by coatings.</li> <li>• Identify and explain the film properties necessary to provide the appropriate protection.</li> <li>• Describe how coatings may provide galvanic (cathodic) protection.</li> <li>• Discuss the different generic types available for use and the conditions under which different systems may be appropriate or inappropriate.</li> <li>• Explain the function(s) of pigments, resins, solvents, and additives.</li> <li>• Explain the differences between water-based and oil-based paints and coatings.</li> <li>• Identify the film-forming mechanisms for different generic types of coatings.</li> <li>• Explain the functions performed by the different types of industrial coatings: <ul style="list-style-type: none"> <li>• Primers/undercoats</li> <li>• Tie, intermediate, build, and guide coats</li> <li>• Finish coats</li> <li>• High-performance coatings</li> </ul> </li> </ul>

4.7	SPECIALTY APPLICATIONS	
	On-the-Job Learning (OJL) – 650 - 850 hours	Related Instruction (RI) – 80 hours
	<p><i>Concrete</i></p> <ul style="list-style-type: none"> <li>Account for the effect each component has on concrete composition.</li> <li>Determine Alkali – Aggregate Reaction and Moisture Vapor Transmissions.</li> <li>Demonstrate the treatment and repair of concrete irregularities, joints and cracks.</li> <li>Demonstrate product mixing and thinning techniques.</li> <li>Conduct an adhesion test of a coating over concrete.</li> </ul> <p><i>Plural Components</i></p> <ul style="list-style-type: none"> <li>Determine the appropriate use of plural component application.</li> <li>Recognize and troubleshoot common problems associated with industrial coatings applied by the plural-component spray method.</li> </ul> <p><i>Thermal Spray</i></p> <ul style="list-style-type: none"> <li>Demonstrate correct and safe operating procedures during electric arc spraying.</li> <li>Demonstrate the ability to apply a thermal spray coating using the arc-spray method and employ the bend test, cut test, and ensile strength bond inspection tests as described.</li> <li>Employ safe operating procedures during electric arc spraying.</li> </ul> <p><i>Waterjetting</i></p> <ul style="list-style-type: none"> <li>Don and doff the proper PPE for waterjetting tasks.</li> <li>Perform daily inspection procedures and identify equipment problems.</li> <li>Evaluate surfaces if the required level of cleanliness has been achieved.</li> </ul> <p><i>Powder Coatings</i></p> <ul style="list-style-type: none"> <li>Demonstrate and describe the two basic powder application systems and their components.</li> <li>Select the most appropriate method of powder coating application for the job.</li> <li>Demonstrate the basics of operating, cleaning, and maintaining the equipment in powder coating systems.</li> </ul>	<p><i>Concrete</i></p> <ul style="list-style-type: none"> <li>Define concrete and its composition.</li> <li>Describe concrete surface preparations.</li> <li>Recognize the importance of reinforcing concrete.</li> <li>Describe the use of protective coatings over concrete.</li> </ul> <p><i>Plural Components</i></p> <ul style="list-style-type: none"> <li>Identify plural component application systems.</li> <li>Identify and describe the primary components of a plural component spray operation system.</li> <li>Identify and describe the physical properties of plural component coatings and how they affect application methods.</li> <li>Define key characteristics of plural components coatings.</li> <li>Identify the physical properties of plural components coatings.</li> <li>Explain how plural components coatings affect application methods.</li> </ul> <p><i>Thermal Spray</i></p> <ul style="list-style-type: none"> <li>Describe common thermal spray methods of application.</li> <li>Describe the proper use and applications of thermal spray coatings.</li> <li>Describe the function of each component in the electric arc process of thermal spraying.</li> <li>Explain the difference between SSPC – SP 3 and SSPC – SP 10 and identify the service environments when each may be specified.</li> <li>Discuss the components of the job reference standard and job control record and the importance and role of each during thermal spray application.</li> </ul> <p><i>Waterjetting</i></p> <ul style="list-style-type: none"> <li>Identify the various components of the waterjetting system.</li> <li>Identify components and functions of Wet Abrasive Blasting (WAB) equipment.</li> <li>Explain the importance of using waterjetting equipment safely.</li> <li>Identify the components and functions of WAB equipment.</li> </ul> <p><i>Powder Coatings</i></p> <ul style="list-style-type: none"> <li>Recognize and describe the conditions when powder is the most appropriate coating system for a job.</li> <li>Identify and describe the operational and safety requirements for the job.</li> </ul> <p><i>Pipeline Coatings</i></p>

	<p><i>Pipeline Coatings</i></p> <ul style="list-style-type: none"> <li>Specify inspection testing of pipeline coatings to identify defects and the appropriate methods of repairing them.</li> <li>Demonstrate plant and field application of pipeline coating systems with different materials and methods of application.</li> </ul> <p><i>Electrostatic Spray</i></p> <ul style="list-style-type: none"> <li>Demonstrate and describe the use of automated and manual systems.</li> <li>Demonstrate operational and safety guidance.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and select pipeline coating systems to be applied in plants.</li> <li>Identify and select pipeline coating systems to be applied in the field.</li> </ul> <p><i>Electrostatic Spray</i></p> <ul style="list-style-type: none"> <li>Describe the basic concepts of electrostatic spray techniques.</li> <li>Identify the type of electrostatic spray appropriate for specific jobs.</li> <li>Identify the basic operational and safety steps of each method.</li> <li>Describe the uses of the Corona and contact charging systems.</li> </ul>
4.8	<b>CONTRACTOR QUALITY MANAGEMENT</b>	
	<b>On-the-Job Learning (OJL) – 250 - 400 hours</b>	<b>Related Instruction (RI) – 40 hours</b>
	<ul style="list-style-type: none"> <li>Demonstrate the ability to determine WFT by notch gauge, DFT by SSPC – PA 2, adhesion by tape method, and dryness or state of cure.</li> <li>Demonstrate a working knowledge of the requirements and standards that apply to the various tasks involved in the QC inspection process, including: <ul style="list-style-type: none"> <li>Pre-surface preparation inspection</li> <li>Measurement of ambient conditions</li> <li>Evaluation of compressor, air cleanliness, and surface preparation equipment</li> <li>Determination of surface preparation, cleanliness, and profile</li> <li>Mixing and thinning of coating materials</li> <li>Evaluation of application equipment</li> <li>Inspecting coating application and cleanliness between coats</li> <li>Determination of wet-film and dry-film thickness</li> <li>Pinhole and holiday testing</li> <li>Evaluating adhesion/cure</li> </ul> </li> <li>Demonstrate how to calibrate and use the test equipment and instruments needed to verify compliance with the various quality control (QC) inspection tasks.</li> <li>Demonstrate how to fill out the various forms used to record the results of QC inspections.</li> </ul>	<ul style="list-style-type: none"> <li>Define quality and how it is used in a painting environment.</li> <li>List the benefits of using a quality system.</li> <li>Explain the differences between quality control and quality assurance.</li> <li>Explain who is responsible for performing quality control and quality assurance inspections.</li> <li>Describe the resources a contractor and the QC inspector should have on hand both in the office and on the job site.</li> <li>Describe the components of a formal quality manual and why it is used.</li> <li>Recognize the importance of document and data control.</li> <li>Identify the types of documents requiring control.</li> <li>Define calibration.</li> <li>Describe the requirements of a calibration program.</li> <li>Recognize the importance of equipment maintenance and associated records.</li> <li>Discuss how to verify and record equipment calibration.</li> <li>Identify appropriate hold points for work inspection during coating application.</li> <li>Recognize pre-bid review, contract amendments, and the CSI format.</li> <li>Describe the importance of the pre-job conference and hold-point/check-point progress meetings and what is covered in each meeting.</li> </ul>