

Model Curriculum

Junior Instrumentation Technician (Process Control)

Sector:	Instrumentation Automation Surveillance & Communication
Sub-Sector:	Instrumentation
Occupation:	Maintenance
Ref ID:	IAS/Q3003
NSQF Level:	3

List of NOS involved:

1. IAS/N0300 Site Readiness and Instrument Usability – Process Control
2. IAS/N0301 Preventive Maintenance – Process Control
3. IAS/N0103 Task reporting – Process Control
4. IAS/N0105 Safety, Health and Environment Process Control
5. IAS/N9001 Work Effectively with Teams
6. DGT/VSQ/N0101 Employability Skill

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Junior Instrumentation Technician (Process Control)

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Junior Instrumentation Technician (Process Control)”, in the “INSTRUMENTATION AUTOMATION SURVEILLANCE & COMMUNICATION” Sector/Industry and aims at building the following key competencies amongst the learner:

Program Name	Junior Instrumentation Technician (Process Control)		
Qualification Pack Name & Reference ID.	IAS/Q3003, V 5.0		
Version No.	4.0	Version Update Date	26/05/2022
Pre-requisites to Training	8th + 1 year NTC or 1 year NAC in relevant field OR 8th + 1 year experience in relevant field		
Training Outcomes	<p>After completing this programme, participants will be able to perform under supervision and guidance:</p> <ul style="list-style-type: none"> • Obtain Permits to work, Check Sheets & Formats • Follows plant working and instrumentation documents. • Service Field Instrumentation, control loops and Control valves • Perform routine checks for Online Analyzers and Analyzer House • Identify and locate DCS & PLC devices. • Locate and identify trouble in Package Units – Boilers, Heaters, Compressors, and Chillers etc. • Locate Fire and Gas Detection system and maintain under guidance. • Follow Site Hygiene guidelines of Field Installations – Visual, Integrity Checks and - Electrical Safety norms, House Keeping and Lighting • Monitor and maintain Consumables and perform follow-up. • Obtain PM-work permit. • Plan, Organize and perform PM-Preparatory tasks and schedules. • Perform PM Visual Checks & Actions • Report faults completed PM tasks, Corrective Maintenance tasks, unusual occurrence, theft and security breach. • Maintain Basic Site Hygiene • Follow health and safety norms of the industry and the organization. • Work effectively in a team 		

This course encompasses 5 out of 5 National Occupational Standards (NOS) of “Junior Instrumentation Technician (Process Control)” Qualification Pack issued by “Instrumentation Automation Surveillance & Communication Sector Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Site Readiness and Instrument Usability – Process Control</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration (hh:mm) 30:00</p> <p>Corresponding NOS Code IAS/N0300</p>	<p>Able to:</p> <ul style="list-style-type: none"> • Follow Process Plant related instructions and directives covering equipment, location, lay out, procedures, forms etc. • Follow the instructions and directives of various permits to work and uses the right one depending on the job he undertakes. • Use Check sheets used in Instrumentation Maintenance work and makes entries. • Use Plant working document relevant to a particular Instrument tag/control loop he is working on, as required. • Use document pertaining to a particular Instrument tag he/she is working with, as required. • Attend to maintenance requests and resolves the problems. Requests for supervisor’s advice and assistance during difficult problem resolution. • Perform basic overhaul and testing under supervision of all standard types of control valves and accessories and can-do basic overhaul and testing under supervision. • Carry out routine checks of online Analyzers and Analyzer house. • Locate the field devices and identifies the interface units – able to work on the system with guidance. • Locate faults relating to operation of package units, location, relates instrument tags to respective Process package unit and undertakes routines and basic trouble shooting in these units. • Refer to overview of fire and gas detection, locates the main field devices, identifies interface units and performs maintenance work on the system with guidance. • Checks for visual damage and 	<p>Laptop, white board, marker, projector, MS Office / Open office, Process Control lab, Industry visits</p>

		<p>tampering</p> <ul style="list-style-type: none"> • Checks for any visible loss of installation integrity. Integrity here means that the instrument and the installation is in a healthy working condition without any unusual appearance, breakage or foreign objects fallen in/on/around the installation which is likely to cause or lead to instrument malfunction. • Check for potential electrical problems due to deviation from standard electrical practices. • Check for floor condition and cluttering of items. • Check for lighting and their operation. Check for unsafe temporary wiring of lighting. • Check consumption and storage of consumables. • Complete follow up action as per assigned areas of responsibility and stipulated instructions. Items found unusual outside this boundary to be reported to supervisor. 	
2	<p>Preventive Maintenance – Process Control</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 45:00</p> <p>Corresponding NOS Code IAS/N0301</p>	<p>Able to:</p> <ul style="list-style-type: none"> • Obtain Permit to Work. • Plan and organize for the day's Preventive Maintenance task. • Execute Preventive maintenance jobs as per available Preventive Maintenance Schedule. • Prepare Process list from process supervisor. • Plan for next day's preventive maintenance schedule • Carry out-Visual Checks and action wherever possible or else transfer job to shut down list. • Complete preventive maintenance schedule list of control valve body, actuator, and accessories. Close the issues in the list. • Collect and consolidate daily diagnostic messages from control valves which have a digital valve controller and record the same in either Preventive Maintenance list or Opportunistic shut down list for execution 	<p>Laptop, white board, marker, projector, MS Office / Open office, Process Control lab, Industry visits</p>

		<ul style="list-style-type: none"> • Include preventive maintenance jobs during annual shut down or opportunistic shut down. • Follow up on consolidated preventive maintenance list and close. 	
3	<p>Task reporting – Process Control</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 15:00</p> <p>Corresponding NOS Code IAS/N0103</p>	<p>Able to:</p> <ul style="list-style-type: none"> • Brief and Escalate faults/issues to immediate supervisor. • Complete entry of preventive maintenance check lists/reports • Complete entry of Corrective Maintenance Check lists /reports • File report on noticing any visible changes in control valve installation or its accessories. Report for immediate attention of supervisor • Report any theft in control valve assembly/spares to supervisor. • Report suspicious movement of new persons near control valve installation to security and supervisor. 	Laptop, white board, marker, projector, MS Office / Open office, Data recording and communication equipment
4	<p>Safety, Health and Environment – Process Control</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 45:00</p> <p>Corresponding NOS Code IAS/N0105</p>	<p>Able to:</p> <ul style="list-style-type: none"> • Interpret and follow formal Instructions from SHE Dept. • Participate in the prescribed drills including familiarization of personal protective equipment, fire extinguisher and first aid. • Follow instructions on Work permit, Fire permit and Hazardous Area Classification, Fire and explosion hazards. • Use right personal protective equipment. • Support supervisor during SHE Audit 	Laptop, white board, marker, projector, MS Office / Open office, Data Recording and communication equipment, Fire Drill Accessories, First Aid Kit, Protective Equipment
5	<p>Work Effectively With Teams</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 15:00</p> <p>Corresponding NOS Code IAS/N9001</p>	<p>Able to understand and practice:</p> <ul style="list-style-type: none"> • Creating team environment • Communicating - giving and receiving • Working cooperatively • Participating in team decision making • Demonstrating Sense of Responsibility • Showing respect for opinions, customs, and preferences 	Laptop, white board, marker, projector, MS Office / Open Office software, email, Printer

Junior Instrumentation Technician (Process Control)

<p>Employability skills Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 15:00</p> <p>Corresponding NOS Code <i>Mapped to</i> <i>DGT/VSQ/N0101</i></p> <p>Introduction to Employability Skills <i>Mapped to</i> <i>DGT/VSQ/N0101</i></p> <p>Duration:1 Hours (1 Theory + 0 Practical)</p> <p>Constitutional values – Citizenship <i>Mapped to</i> <i>DGT/VSQ/N0101</i></p> <p>Duration:1 Hours (1 Theory + 0 Practical)</p>	<ul style="list-style-type: none"> • Discuss the Employability Skills required for jobs in various industries. • List different learning and employability related GOI and private portals and their usage • Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen. • Show how to practice different environmentally sustainable practices. 	<p>Laptop, white board, marker, projector</p> <p>Laptop, white board, marker, projector</p>
<p>Becoming a Professional in the 21st Century <i>Mapped to</i> <i>DGT/VSQ/N0101</i></p> <p>Duration:1 Hours (1 Theory + 0 Practical)</p>	<ul style="list-style-type: none"> • Discuss importance of relevant 21st century skills. • Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life. • Describe the benefits of continuous learning 	<p>Laptop, white board, marker, projector</p>

	<p>Basic English Skills <i>Mapped to DGT/VSQ/N0101</i> Duration: 5 Hours (2 Theory + 3 Practical)</p>	<ul style="list-style-type: none"> • Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone. • Read and interpret text written in basic English. • Write a short note/paragraph / letter/e -mail using basic English. 	<p>Laptop, white board, marker, projector</p>
	<p>Career Development and Goal Setting <i>Mapped to DGT/VSQ/N0101</i> Duration: 3 Hours (1 Theory + 2 Practical)</p>	<ul style="list-style-type: none"> • Create a career development plan with well-defined short- and long-term goals. • 	<p>Laptop, white board, marker, projector</p>
	<p>Communication skills <i>Mapped to DGT/VSQ/N0101</i> Duration: 5 Hours (2 Theory + 3 Practical)</p>	<ul style="list-style-type: none"> • Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette. • Explain the importance of active listening for effective communication. • Discuss the significance of working collaboratively with others in a team. 	<p>Laptop, white board, marker, projector</p>
	<p>Diversity and Inclusion <i>Mapped to DGT/VSQ/N0101</i> Duration: 1 Hours (1 Theory+ 0 Practical)</p>	<ul style="list-style-type: none"> • Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD • Discuss the significance of escalating sexual harassment issues as per POSH 	<p>Laptop, white board, marker, projector</p>
	<p>Financial and Digital Literacy <i>Mapped to DGT/VSQ/N0101</i> Duration: 3 Hours (1 Theory+ 2 Practical)</p>	<ul style="list-style-type: none"> • Outline the importance of selecting the right financial institution, product, and service. • Demonstrate how to carry out offline and online financial transactions, safely and securely. 	<p>Laptop, white board, marker, projector</p>
	<p>Essential Digital Skills <i>Mapped to DGT/VSQ/N0101</i> Duration: 5 Hours (2 Theory+ 3 Practical)</p>	<ul style="list-style-type: none"> • Describe the role of digital technology in today's life. • Demonstrate how to operate digital devices and use the associated applications and features, safely and securely. • Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and 	<p>Laptop, white board, marker, projector</p>

		<p>securely.</p> <ul style="list-style-type: none"> • Create sample word documents, excel sheets and presentations using basic features. • utilize virtual collaboration tools to work effectively. 	
	<p>Entrepreneurship <i>Mapped to</i> <i>DGT/VSQ/N0101</i> Duration: 3 Hours (1 Theory+ 2 Practical)</p>	<ul style="list-style-type: none"> • Explain the types of entrepreneurs and enterprises • Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan. • Describe the 4Ps of Marketing- Product, Price, Place and Promotion and apply them as per requirement. • Create a sample business plan, for the selected business opportunity. 	Laptop, white board, marker, projector
	<p>Customer Service <i>Mapped to</i> <i>DGT/VSQ/N0101</i> Duration: 2 Hours (1 Theory+ 1 Practical)</p>	<ul style="list-style-type: none"> • Describe the significance of analyzing different types and needs of customers. • Explain the significance of identifying customer needs and responding to them in a professional manner. • Discuss the significance of maintaining hygiene and dressing appropriately. 	Laptop, white board, marker, projector

<p>Total Duration 330:00</p> <p>Theory Duration 90:00</p> <p>Practical Duration 150:00</p> <p>OJT 60:00</p> <p>ES (Employability Skills) 30:00</p>	<p>Unique Equipment Required:</p> <ul style="list-style-type: none"> • Laptop, white board, marker, projector, • Process Control lab - including sensors for temperature, pressure, flow etc., actuators, control valves, limit switches, PID controller, meters, tools etc. • MS Office / Open office, • Data recording and communication equipment • Fire Drill Accessories, • First Aid Kit, • Protective Equipment • Industry visits/OJT
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Grand Total Course Duration: 330 Hours, 00 Minutes

Trainer Prerequisites for Job role: “Junior Instrumentation Technician (ProcessControl)” mapped to Qualification Pack: “IAS/Q3003”

Sr. No.	Area	Details
1	Description	<p>Junior Instrumentation Technician (Process Control) is employed in Process industries such as - Oil Refineries, Petrochemicals, Fertilizer Units, Power Plants Steel, Pharmaceuticals, and other Process industries.</p> <p>Junior Instrumentation Technician (Process Control) carries out preventive maintenance, predictive maintenance and corrective maintenance under supervision and guidance. The duties involve Rotational Shifts/General Shifts, including major break downs and annual shutdowns.</p>
2	Personal Attributes	This job requires the individual to be disciplined, assertive, team player, possess analytical skills and problem-solving ability, effective communicator and could work under pressure.
3	Minimum Educational Qualifications	10th Class + I.T.I (Instrumentation/Electronics/Electrical) OR 12th Class (Science (Maths))
4a	Domain Certification	Certified for Job Role: “Junior Instrumentation Technician (Process Control)” mapped to QP: “IAS/Q3003”. Minimum accepted score is 80%
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q0102”. Minimum accepted score is 70%.
5	Experience	10th Class + I.T.I (Instrumentation/Electronics/Electrical) with 2 years industrial experience and 1 year of teaching experience OR 12th Class (Science (Maths) with 2 years industrial experience and 1 year of teaching experience

