Course Curricula

for

Short Term Courses based on Modular Employable Skills (MES)

in

Process Instrumentation Sector

DIRECTORATE GENERAL OF EMPLOYMENT AND TRAINING
MINISTRY OF LABOUR & EMPLOYMENT
GOVERNMENT OF INDIA

Course Curricula for Short Term Courses based on Modular Employable Skills (MES) in the Process Instrumentation Sector

CONTENTS

+

Skill Development based on Modular Employable Skills (MES)

Background

The need for giving emphasis on the Skill Development, especially for the less educated, poor and out of school youth has been highlighted in various forums. The skill level and educational attainment of the work force determines the productivity, income levels as well as the adaptability of the working class in changing environment. Large percentage of population in India is living below poverty line. One of the important causes is lower percentage of skilled persons in the workforce

The skill development at present is taking place mostly in the informal way, i.e. persons acquire skill at the work-place when they help their parents, relatives and employers etc. Such persons do not have a formal certificate and thus earn lower wages and are exploited by employers. They have come through informal system due to socio-economic circumstances of the family and the compulsions of earning a livelihood rather than attending a formal course. While their productivity is low, their contribution to the national GDP cannot be ignored. If the country can create a system of certification which not only recognizes their skills but also provides education and training in a mode that suits their economic compulsions, it will not only benefit the workforce to earn a decent living but also contribute to the national economy by better productivity of this workforce.

Another related problem to be tackled is large number of students drop outs (About 63% of the school students drop out at different stages before reaching Class-X).

Frame work for Skill Development based on 'Modular Employable Skills (MES)'

Very few opportunities for skill development are available for the above referred groups (out of school youth & existing workers especially in the informal sector). Most of the existing Skill Development programmes are long term in nature. Poor and less educated persons can not afford long term training programmes due to higher entry qualifications, opportunity cost etc. Therefore, a new frame work for Skill Development for the Informal Sector has been evolved by the DGET to address to the above mentioned problems. The **key features of the new frame work for skill development** are:

- Demand driven Short term training courses based on modular employable skills decided in consultation with Industry
- Flexible delivery mechanism (part time, weekends, full time)
- Different levels of programmes (Foundation level as well as skill upgradation) to meet demands of various target groups
- Central Government will facilitate and promote training while Vocational Training (VT) Providers under the Govt. and Private Sector will provide training
- Optimum utilisation of existing infrastructure to make training cost effective.
- Testing of skills of trainees by independent assessing bodies who would not be involved in conduct of the training programme, to ensure that it is done impartially.
- Testing & certification of prior learning (skills of persons acquired informally)

The Short Term courses would be based on 'Modular Employable Skills (MES)'.
The **concept for the MES** is :

- Identification of 'minimum skills set' which is sufficient to get an employment in the labour market.
- It allows skills upgradation, multiskilling, multi entry and exit, vertical mobility and life long learning opportunities in a flexible manner.
- It also allows recognition of prior learning (certification of skills acquired informally) effectively.
- The modules in a sector when grouped together could lead to a qualification equivalent to National Trade Certificate or higher.
- Courses could be available from level 1 to level 3 in different vocations depending upon the need of the employer organisations.
- MES would benefit different target groups like :
  - Workers seeking certification of their skills acquired informally
  - workers seeking skill upgradation
  - early school drop-outs and unemployed
  - previously child labour and their familly

Age of participants

The minimum age limit for persons to take part in the scheme is 14 years but there is no upper age limit.

Curriculum Development Process

Following procedure is used for developing course curricula

- Identification of Employable Skills set in a sector based on division of work in the labour market.
- Development of training modules corresponding to skills set identified so as to provide training for specific & fit for purpose
- Organization of modules in to a Course Matrix indicating vertical and horizontal mobility. The course matrix depicts pictorially relation among various modules, pre requisites for higher level modules and how one can progress from one level to another.
- Development of detailed curriculum and vetting by a trade committee and by the NCVT

(Close involvement of Employers Organizations, State Governments, experts, vocational training providers and other stake holders is ensured at each stages).

Development of Core Competencies

Possession of proper attitudes is one of the most important attribute of a competent person. Without proper attitudes, the performance of a person gets adversely affected. Hence, systematic efforts will be made to develop attitudes during the training programme.

The trainees deal with men, materials and machines. They handle sophisticated tools and instruments. Positive attitudes have to be developed in the trainees by properly guiding them

and setting up examples of good attitudes by demonstrated behaviors and by the environment provided during training.

Some important core competencies to be developed are:

1. Safety consciousness and safe working practices
2. Care of equipment and tools
3. Punctuality, discipline and honesty
4. Concern for quality
5. Respect for rules and regulations
6. Concern for health and hygiene
7. Cordial relationship and Cooperation with co-workers and team Work
8. Positive attitude and behavior
9. Responsibility and accountability
10. Learn continously
11. Communication Skills
12. Concern for environment and waste disposal

Following competencies should also be developed during level-II and higher courses:

1. Ability for planning, organizing and coordinating
2. Creative thinking, problem solving and decision making
3. Leadership
4. Ability to bear stress
5. Negotiation

Duration of the Programmes

Time taken to gain the qualification will vary according to the pathway taken and will be kept very flexible for persons with different backgrounds and experience. Duration has been prescribed in hours in the curriculum of individual module, which are based on the content and requirements of a MES Module. However, some persons may take more time than the prescribed time. They should be provided reasonable time to complete the course.

Pathways to acquire Qualification:

Access to the qualification could be through:

- An approved training programme; **Or**
- A combination of an approved training programme plus recognition of prior learning including credit transfer; **Or**
- The recognition of prior learning that provides evidence of the achievement of the competencies for the qualification.

Methodology

The training methods to be used should be appropriate to the development of competencies. The focus of the programme is on “performing” and not on “Knowing”. Lecturing will be restricted to the minimum necessary and emphasis to be given for ‘hands on training’.

The training methods will be individual centered to make each person a competent one. Opportunities for individual work will be provided. The learning process will be continuously monitored and feedback will be provided on individual basis.

Demonstrations using different models, audio visual aids and equipment will be used intensively.

Instructional Media Packages

In order to maintain quality of training uniformly all over the country, instructional media packages (IMPs) will be developed by the National Instructional Media Institute (NIMI), Chennai.

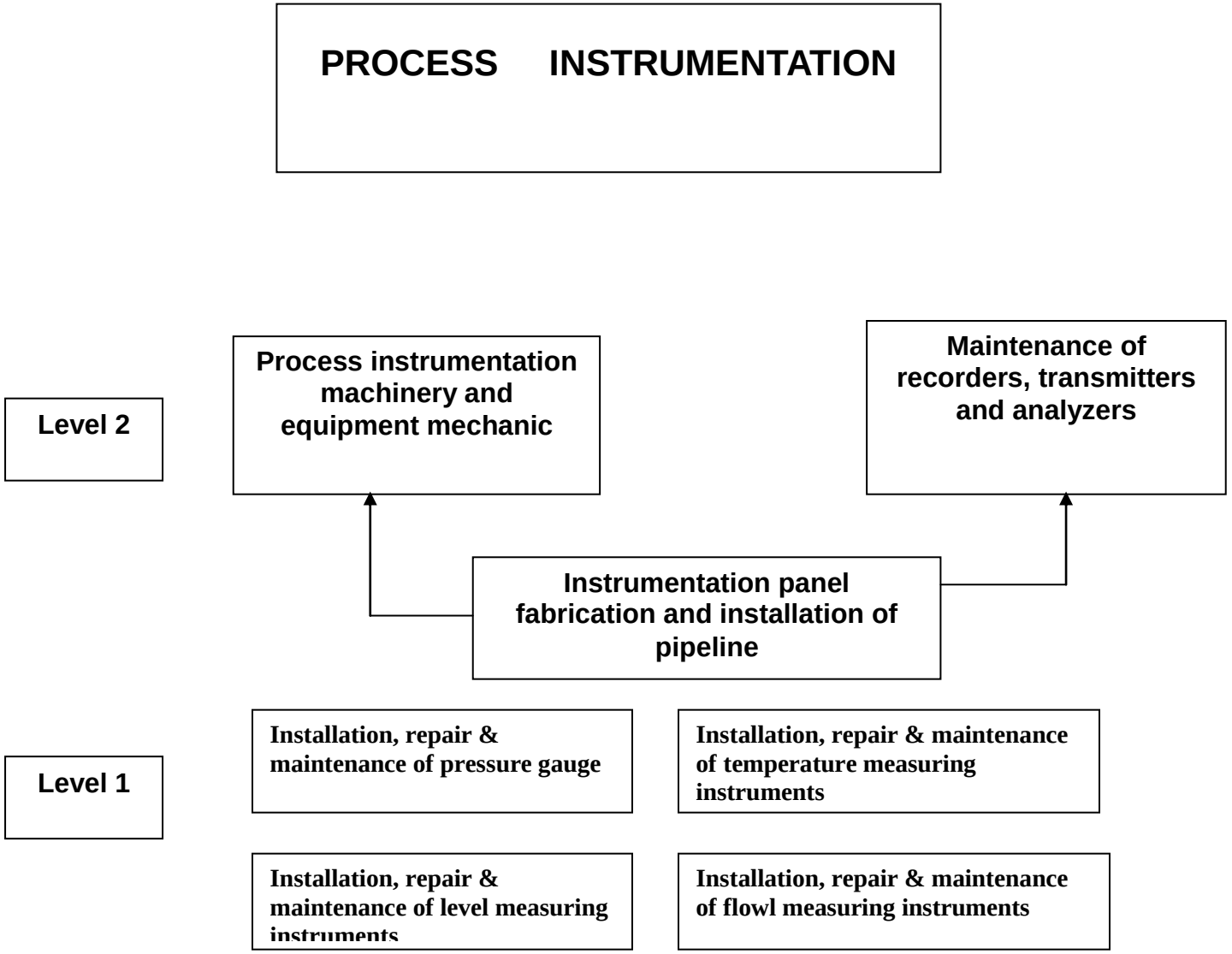
Assessment

DGE&T will appoint assessing bodies to assess the competencies of the trained persons. The assessing body will be an independent agency, which will not be involved in conducting the training programmes. This, in turn, will ensure quality of training and credibility of the scheme. Keeping in view the target of providing training/testing of one million persons through out the country and to avoid monopoly, more than one assessing bodies will be appointed for a sector or an area.

Certificate

Successful persons will be awarded certificates issued by National Council for Vocational Training (NCVT).

Course Matrix



MODULES

Instrumentation Panel Fabrication and Installation of pipeline

NAME :**Instrumentation Panel Fabrication and Installation of pipeline**

SECTOR **:Process Instrumentation**
CODE **:PRO101**
Terminal Competencey On completion of this module, the trainee will be able to :

- fabricate an Instrument panel and will be
- install the required pipe line.

DURATION 160 Hours

ENTRY QUALIFICATIONS 8th Standard pass with atleast 14 years of age

CONTENTS

Underpinning Knowledge (Theory	Practical Competencies
Safety and First Aid. Introduction to Electricity and Instrumentation. Basic units and measurements. Industries associated with Process Instrumentation. (Chemical, Paper, Fertilizer, Steel etc)	Use of ruler, measuring tape. Use of Multimeter (Digital & Analog). Material Handling and Safety precautions to be taken. Fire fighting. First aid practice. Do's and Don'ts.
Use of Hand Tools (Screw Drivers, Pliers, Cutting and Drilling tools, Hammers, Spanners and Files) Use of power drill.	Use of Screwdrivers, hammers, files and drilling machines.
Copper, MS, GI and Plastic pipes. Their sizes and use. Pipe Fittings (Bends, nipples, unions, elbows) and jointing.	Use of pipe threading tools . Use of cutters in cutting sheets. Drilling holes. And fabrication of panels.
Use of Pipe Threading tools and pipe Vises, Pipe bending machine and pipe cutters.	Installation of pressure gauges, temp indicators and level indicators and switches
Fabrication of Instrument panels. Installation of pipelines. Introduction to Welding. Knowledge of Arc Welding, Spark Welding, Gas Welding etc	Exercises on panel fabrication
Different types of Process parameters and their units and principles of process Indicators. (Temperature, Pressure, Level and Flow).	Exercises on pipe line fabrication
Temperature, level and pressure switches and their maintenance.	Installation of Temp/level /pressure switches

List of tools and equipments:

SlNo.	Description	Quantity
1	Assorted screw drivers	4 sets
2	Assorted pliers	4 sets
3	Assorted files	4 sets
4	Assorted hammers and pipe wrenches	3 sets
5	Heck saws	3 sets
6	Pipe threading (die set) and tap set	2 sets
7	Pipe cutters	3 sets
8	Work benches with pipe and normal vises	2 sets
9	Temperature, pressure, level and flow indicators	2 sets
10	Temperature, pressure, level switches	
11	GI and MS pipes of assorted sizes and pipe fitting , MS and Aluminum sheets, Copper tubes.	

Process Instrumentation Machinery and Equipment Mechanic.

NAME :**Process Instrumentation Machinery and Equipment Mechanic.**

SECTOR : **Process Instrumentation**
CODE : **PRO202**
TERMINAL COMPETENCEY: On completion of this Module, the trainees will be Able to Maintain and service air compressors, Hot air ovens, geysers, coolers, Pressure, Temperature, Level and Flow indicators

DURATION :160 Hours

ENTRY QUALIFICATIONS : 8th Standard pass with atleast 14 years of age & MES Modules on Instrumentation Panel Fabrication and Installation of pipeline

CONTENTS

Underpinning Knowledge (Theory	Practical Competencies
Introduction to Electrical Machines (AC and DC Motors, Generators). Batteries, Cells and chargers, UPS. Electrical relays and starters	Exercises on AC and DC motors Maintenance and Maintenance free batteries.
Air Compressors (Pneumatic lines, air filters, air regulators and Installation of pneumatic lines)	Study of different parts of Air Compressors
Pressure gauges and their calibration using Dead Weight pressure gauge testers	Dismantling and assembling of Pressure gauges, Temperature gauzes , level and flow indicators
Hot Air Ovens, Room Heaters, Geysers, Coolers (Thermal Switches, humidity sensors). Installation and Maintenance. Varieties of Temperature indicators and their calibration	. Repair and maintenance of hot air ovens, geyser, coolers
Level sensors, level indicators and Level Switches and level Controllers (on off) Installation of overhead tank level controllers and sump level Controllers	Calibration and maintenance of pressure, temperature, level and flow indicators
Simple Mechanical type Flow indicators	.Use and calibration of flow indicators
Solar Water Heater Installation.	Installing solar panels on Solar water heater.

List of Tools and Equipment:

SlNo	***Description***	***Quantity***
1	Single Phase AC motors	2
2	DC motors	2
3	Air Compressor	1
4	Geysers	1
5	Hot Air ovens	1
6	Bourden Tube Pressure gauges	3
7	Filled system them meters	3
8	Float Type level indicator	2
9	Rotameters	2
10	Venturi/Orifice type flow meter	2
11	Dead Weight Pressure gauge Tester with Master gauges	1
12	Different types of Thermocouples	1 set
13	Tools kits	4 sets

Maintenance of Recorders, Transmitters and Analyzers

NAME :**Maintenance of Recorders, Transmitters and Analyzers**

SECTOR **: Process Instrumentation**

CODE **:PRO203**

TERMINAL COMPETENCEY **:**On completion of this module the trainees will be able to maintain and repair process recorders, transmitters and analyzers

DURATION **:**160 Hours

ENTRY QUALIFICATIONS **:**8th Standard pass with atleast 14 years of age & MES Modules on Instrumentation Panel Fabrication and Installation of pipeline

CONTENTS

Underpinning Knowledge (Theory	Practical Competencies
Introduction to Recorders (Circular chart, strip chart). Potentiometer and Current recorders. Single and Multi point recorders. Calibration and Maintenance of recorders. Pneumatic recorders	Exercises on varieties of recorders (Electronics and pneumatics)
Temperature, pressure, level and flow transmitters. (Electrical and Pneumatics)	Exercises on transmitters. (Electronics and pneumatics
Introduction to Chemical analysis. Use of pH meters, Conductivity meters, Smoke and fire alarms and their maintenance. Use of air /water pollution monitoring equipment. Sensors and Detectors.	Exercises on analytical instruments
Installation of air ionizes, aqua guards, dehumidifiers smoke detectors, fire alarms, air curtains and kitchen chimneys	Exercises on maintenance of kitchen appliances (chimneys, fire alarms, smoke detectors etc). Water Purifiers, Reverse Osmosis equipments

List of tools and equipment:

SlNo	*Description*	*Quantity*
1	Pressure Recorders (Circular chart)	2
2	Temperature Recorders (Circular Chart)	2
3	Potentiometric Recorders	2
4	Temperature Transmitters (Electronic)	2
5	Pressure Transmitters (Electronics)	2
6	Level Transmitter (Electronics)	2
7	Flow Transmitter (Electronics)	2
8	pH meters	2
9	Conductivity meters	2
10	Aqua guards	2
11	Smoke alarms	2
12	Fire alarms	2
13	CO2 and CO analyzer (For automobiles pollution)	1
14	Tool Kits	4 sets

Name of the Course : **INSTALLATION, REPAIR AND MAINTENANCE OF PRESSURE GAUGE**

Sector : **Process Instrumentation**

Code : **PRO 104**

Terminal Competence:

On Completion of the module, the trainees will be able to

Measure pressure using different types of pressure gauge. The trainees also able to maintain and service of manometer, bourdon tube, capsule and diaphragm gauges. The module will also give handful competence in calibration and installation of different pressure gauges.

Duration : **80 Hours**

Qualification : **8th standard pass with at least 14 years of age.**

Contents :

Underpinning Knowledge (Theory)	Practical Competencies
Different types of pressure and Units. Conversion of pressure units.	Familiarization and practice of pressure measurement using different pressure gauges.
Principle of working of manometers.	Pressure measurement using manometer and manometer leveling and adjustment.
Working Principle of C-type Bourdon tube, Bellows, capsule, diaphragm gauges General faults of different pressure gauges and procedure of rectification .	Disassemble and assemble of C-type Bourdon gauge, diaphragm, capsule and bellows gauge. Faults identification and rectification.
Principle of operation of Dead weight Tester / Comparator	Operation and use of dead weight tester. Practice calibration of different pressure gauges.
Calibration Procedure of Pressure gauges and trace ability aspects . Preventives maintenance of pressure instruments . Introduction to controller.	Fitting and checking of pressure gauges in the pipe line.

List of Tools and equipment:

Sl. No	Description	Quantity
	Tools	
1.	Assorted screw Drivers kits	4 Set
2.	Assorted pliers	4 Set
3.	Chisel	4 Nos.
4.	Assorted files	4 Set
5.	Assorted hammers	4 Nos.
6.	Assorted pipe wrenches	4 Set
7.	Heck saws	4 Nos.
8.	Pipe threading (die Set) and tap Set	4 Set
9.	Pipe cutters	4 Nos.
11.	Pointer Puller	4 Set
12.	Pointer Punch	4 Set
13.	Spanners	4 Set
	Equipment	
14.	Work benches with pipe and normal vises	4 Nos.
15.	GI and MS pipes of assorted sizes	As required
16.	Dead weight tester	2 Nos.
17.	Bourdon tube gauge	8 Nos.
18.	Bellows , diaphragm and capsule pressure gauges	8 Nos.
19.	Pressure calibrator Fluke or equivalent	2 Nos.
20.	U –tube , Wall type, Digital Manometer	6 Nos. Each
21.	Digital pressure gauge	6 Nos.
22.	Air Compressor	1 No

Name of the Course : **INSTALLATION, REPAIR AND MAINTENANCE OF TEMPERATURE MEASURING INSTRUMENTS**

Sector : **Process Instrumentation**

Code :**PRO105**

Terminal Competence :

This course is concerned with temperature measurement sensors and calibration.

On Completion of the module, the trainees will be able to do

Installation various thermometer

Temperature measurement using various thermometer from – 0° C to 1000° C as per ITC 90 scale .Installation and connection of thermocouple & RTD for temperature measurement. Calibration and error compensation of thermocouple & RTD

Develop some physical analogies

Duration : **80 hours**

Qualification : **8th standard pass with at least 14 years of age .**

Contents :

Underpinning Knowledge (theory)	Practical Competencies
Different types of Temperature scale & units. Conversion of temperature units.	Familiarization of different types of thermo meter and their scale.
Working principle and operation of thermometers – Bimetallic, gas filled, liquid filled, vapour and pressure thermometers. General faults of different Temperature gauges and procedure of rectification .	Practice temperature measurement using - Bimetallic, gas filled, liquid filled, vapour and pressure thermometers
Principle of operation of thermo Couple, Thermo – couple materials and colour Code .	Select, installation and connection of different thermo couples and RTD for temperature measurement. Faults identification and rectification.
Principle of operation of RTD & thermister Preventives maintenance of Thermocouple and RTD	Calibration of thermo couple, error compensation of thermo couple.
Operation of temperature calibrator and trace ability aspects Introduction to temperature controller .	Temperature calibration using temperature bath and temperature calibrator.

List of Tools and equipment:

Sl.No	Description	Quantity
	Tools	
1.	Assorted screw Drivers kits	4 Set
2.	Assorted pliers	4 Set
3.	Assorted files	4 Set
4.	Assorted hammers	4 Nos.
5.	Assorted pipe wrenches	4 Set
6.	Heck saws	4 Nos.
7.	Pipe threading (die Set) and tap Set	4 Set
8.	Pipe cutters	4 Nos.
9.	Work benches with pipe and normal vises	4 Nos.
10.	GI and MS pipes of assorted sizes	As required
	Equipment:	
11.	3 ½ Digit Hand held DMM	6 Nos.
12.	Power Supply 0 –30 V ,0-1 Amp with digital display for voltage and current	2 Nos.
13.	Liquid filled thermometer	6 Nos.
14.	Vapour filled thermometer	6 Nos.
15.	Bi metal thermo meter	6 Nos. Each
16.	Thermo couples (J ,K, T, R,S, & B Type)	6 Nos.
17.	Pt 100, Thermistors	6 Nos.
18.	Temperature bath with PID controller	2 Nos.
19.	Temperature calibrator for thermocouple and RTD	1 No.

Name : **INSTALLATION, REPAIR & MAINTENANCE OF FLOW MEASURING INSTRUMENTS**

Sector : **Process Instrumentation**

Code : **PRO 106**

Terminal Competence :

This course is concerned with flow measurement sensors and calibration.

On Completion of the module, the trainees will be able to do

Installation various flow sensors and transmitter in the pipe line Maintenance of different flow sensors Calibration of flow sensors and transmitter .

Duration : **80 Hours**

Qualification : **8th standard pass with at least 14 years of age.**

Contents :

Underpinning Knowledge (theory)	**Practical Competencies**
Importance and methods of flow measurement and Units of flow	Familiarization of different flow meters
Principle & operation of quantity flow meter .	Internal and external parts identification of Quantity flow meter . Calibration and maintenance of quantity flow meter.
Principle and operation of Venturi, flow nozzle, orifice, pitot tube for flow measurement . General faults of different sensors and procedure of rectification . Preventive maintenance of different flow sensing unit.	Installation of Venturi, flow nozzle, orifice, pitot tube in pipe line for flow measurement along with flow transmitter . Faults identification and rectification .
Working principle of rotameter	Installation of rotameter in pipe line and measurement of flow rate .
Flow measurement technique using DP transmitter Calibration of flow transmitter and trace ability aspects Introduction to flow controller.	Calibration of DP transmitter for flow measurement.

List of Tools and equipment:

Sl.No	**Description**	**Quantity**
	Tools:	
1.	Assorted screw Drivers kits	4 Set
2.	Assorted pliers	4 Set
3.	Chisel	4 Nos.
4.	Assorted files	4 Set
5.	Assorted hammers	4 Nos.
6.	Assorted pipe wrenches	4 Set
7.	Heck saws	4 Nos.
8.	Pipe threading (die Set) and tap Set	4 Set
9.	Pipe cutters	4 Nos.
10.	Work benches with pipe and normal vises	4 Nos.
11.	GI and MS pipes of assorted sizes	As required
	Equipment:	
12.	3 ½ digit Hand held DMM	4 Nos.
13.	Quantity flow meter/ positive displacement flow meter	6 Nos.
14.	Orifice plate & Flages	6 Nos.
15.	Flow nozzles and accessories	6 Nos.
16.	Pitot tube	6 Nos.
17.	DP transmitter	4 Nos.
18.	Multi Purpose Process calibrator	2 Nos.

Name : **INSTALLATION, REPAIR & MAINTENANCE OF LEVEL MEASURING INSTRUMENTS**

Sector : **Process Instrumentation**

Code : **PRO 107**

Terminal Competence :

This course is concerned with level measurement sensors and calibration.

On Completion of the module, the trainees will be able to do

Installation various Level sensors and transmitter in the pipe line.

Maintenance of different level sensors

Calibration of level sensors and transmitter.

Duration : **80 Hours**

Qualification : **8th standard pass with at least 14 years of age.**

Contents :

Underpinning Knowledge (theory)	Practical Competencies
Working principle of level measurement using – Slide glass, Float and Displacer General faults of different Level gauges and procedure of rectification .	Level measurement using –slide glass, float, Displacer. Repair and maintenance of Slide glass, float and displacer.
Principle of level measurement by Hydro static Head methods.	Level measurement using DP transmitter and Level transmitter calibration. Level transmitter maintenance and repair.
Principle of level measurement by capacitance method. Methods of preventive maintenance of level gauges and transmitter .	Level Measurement using capacitance method. Capacitance sensor Maintenance and repair Maintenance and repair of Level switches.
Operation of level transmitter Calibration of level sensors and Trace ability aspects. Introduction to level controller.	Mount, operate, adjust, calibrate and test different types of level gauges

List of Tools and equipment:

Sl.No	Description	Quantity
	Tools:	
1.	Assorted screw Drivers kits	4 Set
2.	Assorted pliers	4 Set
3.	Chisel	4 Nos.
4.	Assorted files	4 Set.
5.	Assorted hammers	4 Nos.
6.	Assorted pipe wrenches	4 Set
7.	Heck saws	4 Nos.
8.	Pipe threading (die Set) and tap Set	4 Set
9.	Pipe cutters	4 Nos.
10.	Work benches with pipe and normal vises	4 Nos.
11.	GI and MS pipes of assorted sizes	As required
	Equipment:	
12.	3 ½ digit Hand held DMM	4 Nos.
13.	Sight glasses for liquid level measurement	6 Nos. each
14.	Different types of Level switch	6 Nos. each
15.	Conductivity type Level sensors	6 Nos.
16.	Capacitance Level Sensor	4 Nos.
17.	Smart Level transmitter	4 Nos.
18.	Smart Level DP transmitter	4 Nos.
19.	Multi Purpose Process calibrator	2 Nos.
20.	Water Tank	2 Nos.

ATI – EPI, HYDERABAD

LIST OF MEMBERS WHO HAVE ATTENDED THE TRADE COMMITTEE MEETING HELD ON 12TH MARCH, 2009 AT 3.00 P.M. IN THE COMMITTEE ROOM OF THE INSTITUTE TO DEVELOP CURRICULUM DEVELOPMENT IN PROCESS INSTRUMENTATION SECTOR UNDER SKILL DEVELOPMENT INITIATIVE ON (SDI) SCHEME BASED ON MODULAR EMPLOYABLE SKILLS (MES).

S.No.	Name of the Member S/SHRI	Designation / Organization	Remarks
1.	V.M. Rao	Director, ATI-EPI, Ramanthapur, Hyderabad	Chairman
2.	A. P. C. Rao	Addl.G.M. B.H.E.L., , Ramchandrapuram, Hyderabad	Member
3.	Dr.A. Seshu Kumar	Scientist Gr.IV/E-II, H.O.D., General Engg. Division, I.I.C.T., Habsiguda, Hyderabad	Member
4.	V. Ramakrishna	Proprietor, M/s Vedsri I.T. Solutions Pvt. Ltd., Vidyanagar, Hyderabad	Member
5.	K.V. Ratnakar	Manager, M/s Polmon Instruments Pvt. Ltd., Hyderabad	Member
6.	M. Sudhendra	Asst. Director, A.T.I., Vidyanagar, Hyderabad	Member
7.	H. Madhava Rao	Jt. Director, ATI-EPI, Ramanthapur, Hyderabad-500 013.	Member
8.	C. Chandrasekhar	Dy. Director, ATI-EPI, Ramanthapur, Hyderabad-500 013.	Member
9.	C.S.Murthy	Dy. Director, ATI-EPI, Ramanthapur, Hyderabad-500 013.	Member
10.	A.M. Tupkar	Asst. Director, ATI-EPI, Ramanthapur, Hyderabad-500 013.	Member
11.	Sharnappa	Trg. Officer, ATI-EPI, Ramanthapur, Hyderabad-500 013.	Member
12.	Ujjwal Biswas	Dy. Director. ATI-EPI, Ramanthapur, Hyderabad-500 013.	Member / Co-ordinator

List of Expert/Trade Committee Members

SECTOR/AREA: **Process Instrumentation**

S.No.	Name of the Member with Designation **S/Shri:**	Name of the Organization / Industry	Phone No.
1.	Dr. E.V.R. Rao	M/s OSI Systems Pvt. Ltd., Hyderabad.	27848981
2.	M.V. Ramana, General Manager	E.C.I.L., Cherlapalli, .Hyderabad.	
3.	M.V. Satish Kumar, Sr. Lecturer	G.I.P.D.C.E.T., Hyderabad	27403688
4.	S. Veeresha Lingam	I.A.F., Hyderabad	9848963506
5.	H. Somasundaram, Director	ATI – EPI, Ramanthapur, Hyderabad	27037266
6.	R.L. Singh, Jt. Director	-do-	-do-
7.	R.B.S. Naik, Dy. Director	-do-	-do-
8.	M. Sudhendra, Trg. Officer	-do-	-do-

File name : **MES - process int Aug 2007**