Course Brochure

Operation & Process Technology Department, TICI

Course No.	**:**	**03**
Course Title	**:**	**Performance Study & Operation of different types of Heat Exchanger using SCADA and PID Control**
Course Code	**:**	**PT- U337**
Duration	**:**	1 Week
Period	**:**	18 ~ 23 January, 2020
Nomination deadline	**:**	1~2 Weeks before commencing date
No. of Course	**:**	01
No. of Participants	**:**	20
Course fee	**:**	Tk. 7,800/- Per Participant
Designed for	**:**	Junior and mid-level officers working in different industries & other establishments.

Course Objectives:

- To learn about different types of heat exchangers and their characteristics
- To learn heat transfer equipment and their application
- To determine effectiveness of heat exchanger. and
  To learn about cleaning method of heat exchanger

Mode of Heat Transfer and Heat Transfer Media, Basic system of Heat Transfer and Types of Heat Exchanger, Heat Transfer Equipment and Their Application, Constructional Parts of Heat Exchanger, Performance Criteria and Operational Features of Heat exchanger, Corrosion, Scaling, Fouling and Effect of Cooling Water on Heat Exchanger, Chemical Cleaning and Passivation of Heat Exchanger, Inspection and Trouble Shooting of Heat Exchanger, Exchanger effectiveness determination. *Industrial safety.*

Practice and Study of Shell & Tube Heat Exchanger, NTU Method, Flow influence on the heat transfer. Reynolds number calculation, Nusselt number etc. using SCADA & PID control.

Training Methodology:

- Class-room lecture (Multimedia projector, Overhead projector etc.)
- Practical & Demonstration class
- Group Discussion
- Report preparation and presentation
- Case study

Evaluation system:

Attendance, Class participation & Overall performance

Course Advisor	**:**	Executive Director
Course Co-Advisor	**:**	Training Director

Course Brochure

Operation & Process Technology Department, TICI

Course Director : Head of Operation & Process Technology Department

Course Coordinator : Shamima Yesmin Sony, Executive Engineer (Chem.)

Course No.	:	**10**
Course Title	:	**Industrial Waste Water Treatment & Effluent Management**
Course Code	:	**PT- U108**
Duration	:	2 Weeks
Period	:	23 Feb ~ 05 March, 2019
Nomination deadline	:	1~2 Weeks before commencing date
No. of Course	:	01
No. of Participants	:	20
Course fee	:	Tk. 12,300/- Per Participant
Designed for	:	Operator/Technicians working in different industries and other establishments.

Course Objectives:

- To know the techniques of operation of water & waste water treatment plant
- To improve knowledge about different water treatment processes such as:
    - Raw water treatment, Ion exchange demineralization & membrane separation
- To develop knowledge of water treatment plant instrumentation & quality control methods
- To enhance knowledge about water treatment plant, Standard operating procedure, Safety & trouble-shooting of water treatment plant.

Course Content:

Introduction to Industrial Waste Water Treatment; Process Symbols & Process Diagrams; Industrial Raw Water Treatment; Ion Exchange Process & Regeneration of Ion Exchanger; Water Treatment by Membrane Separation Processes; Water Treatment Plant Instrumentation; Water Pollution & Different Methods of Waste Water Treatment; Trouble Shooting of Water Treatment Plant; Effluent & Emission control in Pulp & Paper Industry; Introduction to IndustrPractice on Process Symbol and Process Diagram

Practice on Water Treatment Pilot Plant (Lime- Soda softening); Water Demineralization by Ion Exchange & Reverse Osmosis; Analysis for water quality: Hardness, Turbidity, Acidity, Alkalinity, BOD & COD; Jar test for determination of coagulant quantity; Personal Protective Equipment & Fire Protection Arrangemential Safety; Case study : Effluent Treatment Plant (ETP).

Course Brochure

Operation & Process Technology Department, TICI

Training Methodology:

- Class-room lecture (Multimedia projector, Overhead projector etc.)
- Practical & Demonstration class
- Group Discussion
- Report preparation and presentation
- Case study

Evaluation system:

Attendance, Class participation & Overall performance

Course Advisor	**:**	Executive Director
Course Co-Advisor	**:**	Training Director
Course Director	**:**	Head of Operation & Process Technology Department
Course Coordinator	**:**	Sangib Kumar Roy, Deputy Chief Chemist

Course No.	**:**	**15**
Course Title	**:**	**Industrial Water Treatment & Operation of Water Treatment Plant**
Course Code	**:**	**PT- U108**
Duration	**:**	2 Weeks
Period	**:**	29 March ~ 09 April, 2020
Nomination deadline	**:**	1~2 Weeks before commencing date
No. of Course	**:**	01
No. of Participants	**:**	20
Course fee	**:**	Tk. 12,300/- Per Participant
Designed for	**:**	Operator/Technicians working in different industries and other establishments.

Course Objectives:

- To know the techniques of operation of water & waste water treatment plant

- To improve knowledge about different water treatment processes such as:
  - Raw water treatment, Ion exchange demineralization & membrane separation
- To develop knowledge of water treatment plant instrumentation & quality control methods
- To enhance knowledge about water treatment plant, Standard operating procedure, Safety & trouble-shooting of water treatment plant.

Course Content:

Introduction to Industrial Water Treatment ; Raw Water Treatment; Process Symbols and Process Diagrams; Ion Exchange Process and Regeneration of Ion Exchanger; Water Conditioning for Boiler; Cooling Water and its Treatment; Water Treatment by Membrane Separation Processes; Water Treatment Plant Instrumentation; Principal Constituents of Concerns in Wastewater Treatment; Waste Water Treatment Techniques; Troubleshooting of Water Treatment Plant; Practice on Process Drawing; Water Treatment (Lime-Soda softening); Water Demineralization by Ion Exchange and Reverse Osmosis; Analysis Key Parameters for Water Quality: Hardness, Turbidity, Acidity, Alkalinity BOD and COD etc.; Jar test for Optimum Chemical Doasing; Industrial safety

Training Methodology:

- Class-room lecture (Multimedia projector, Overhead projector etc.)
- Practical & Demonstration class
- Group Discussion
- Report preparation and presentation
- Case study

Evaluation system:

Attendance, Class participation & Overall performance

Course Advisor	**:**	Executive Director
Course Co-Advisor	**:**	Training Director
Course Director	**:**	Head of Operation & Process Technology Department
Course Coordinator	**:**	Md. Ashraf Ali, Deputy Chief Chemist

Course No.	**:**	**22**
Course Title	**:**	**Industrial Boilers & Operation of Steam Generation system**
Course Code	**:**	**PT- U106**
Duration	**:**	2 Weeks
Period	**:**	05 ~ 16 June, 2020

Course Brochure

Operation & Process Technology Department, TICI

Nomination deadline	**:**	1~2 Weeks before commencing date
No. of Course	**:**	01
No. of Participants	**:**	20
Course fee	**:**	Tk. 12,300/- Per Participant
Designed for	**:**	Operator/Technicians working in different industries and other establishments.

Course Objectives:

- To develop the performance to do the job with more skill and confidence in the field of boiler operation
- To acquaint different parts of industrial boiler.
- To learn about internal & external treatment of boiler water.
- To enhance knowledge about Boiler control system, Standard operating procedure, Safety & Preservation of industrial boiler etc.

Course Content:

Introduction to Industrial Boiler and steam system, Process symbols & Process diagrams, Familiarization with constructional parts of boiler, External treatment for boiler feed water, Internal treatment for boiler water, Combustion management of boiler, Burner & firing system of boiler, Control & Safety system of boiler, Standard operating procedure (SOP) of boiler, Boiler blow-down, heat recovery and de-aerator, Boiler energy efficiency, Cleaning & preservation of boiler, Sequential logic interlock system, Industrial Safety etc. Basic concept of industrial productivity; Industrial safety, Personal protective equipment and fire protection arrangement.

Training Methodology:

- Class-room lecture (Multimedia projector, Overhead projector etc.)
- Practical & Demonstration class
- Group Discussion
- Report preparation and presentation
- Case study

Evaluation system:

Attendance, Class participation & Overall performance

Course Advisor	**:**	Executive Director
Course Co-Advisor	**:**	Training Director
Course Director	**:**	Head of Operation & Process Technology Department
Course Coordinator	**:**	Abdullah Al Mehedi, Deputy Chief Engineer

Course Brochure

Operation & Process Technology Department, TICI

Course No.	:	**37**
Course Title	:	**Measuring & Control of Process Parameters using SCADA and PID**
Course Code	:	**PT-U120**
Duration	:	2 Week
Period	:	16~ 27 August, 2020
Nomination deadline	:	1~2 Weeks before commencing date
No. of Participants	:	20
Course fee	:	Tk. 12,300/- Per Participant
Designed for	:	Operator/Technicians working in different industries and other establishments.

Course Objectives:

- To develop technical knowledge about process instruments and their working principle, uses and operation.
- To develop the performance to do the job in process industries with more skill & more confidence.
- To build up a confidence in process control technique.
- Participants will be able to operate a control panel confidently.

Course Content:

Introduction to Control Technique of Process Parameters; Indicating, Recording and Counting Instruments; Process Symbols and Process Diagram; Pressure and Differential Pressure Measurement; Liquid Level Measurement; Fluid flow and temperature measurement; Transmitters; Controllers and It's Mode of Operation; Process Control Loops; Single Control Loop: Open, Close Loops, Feed Forward, Feed Back- Control Loops, Up stream, Downstream Control etc.; Complex Control Loop: Ratio Control Loop, Cascade Control Loop, Split–Range Control Loop; Control Valve; Sequential Logic Inter-lock Diagram; Industrial Safety;

Practice on Process Symbols and Process Diagram; Level Measurement by Using Immersed Body (Displacer);Input-Output(I/O),relationship of a Transmitter; Study of Process Response For Level Control Loop By Using Different Size Liquid Tank; Study of Level Flow Cascade Control Loop and Determination of Valve Characteristics; Sequential Logic Operation, Control of Process Parameters using SCADA & PID Control.

Training Methodology:

- Class-room lecture (Multimedia projector, Overhead projector etc.)
- Practical & Demonstration class
- Group Discussion
- Report preparation and presentation; # Case study

Evaluation system:

Attendance, Class participation & Overall performance

Course Advisor	**:**	Executive Director
Course Co-Advisor	**:**	Training Director
Course Director	**:**	Head of Operation & Process Technology Department
Course Coordinator	**:**	Sangib Kumar Roy, Deputy Chief Chemist.

Course No.	**:**	**35**
Course Title	**:**	**Industrial Corrosion & Corrosion Control**
Course Code	**:**	**PT- U321**
Duration	**:**	1 Week
Period	**:**	26 September ~ 01 October, 2020
Nomination deadline	**:**	1~2 Weeks before commencing date
No. of Course	**:**	01
No. of Participants	**:**	20
Course fee	**:**	Tk. 7,800/- Per Participant
Designed for	**:**	Junior and mid-level officers working in different industries & other establishments.

Course Objectives:

- To know about the industrial corrosion, principles/mechanism effects of corrosion etc
- To develop the knowledge about different corrosion protection methods.
- To make aware of corrosion problems in industries

Course Content:

Introduction to industrial corrosion; (Corrosion principles, Effects of corrosion, Cause of corrosion, Cost of corrosion); Classification of corrosion; Classification

based on Mechanism, Environment, Corrosivity effect; Factors influencing corrosion (Metallurgical aspects, Mechanical factors, Environmental factors); Corrosion in aqueous environment (Corrosion in cooling water system and steam circuits); Corrosion of pipelines in soil;- Nature of soil corrosion ;- Biological corrosion - Testing and remedial measures; Protection against corrosion:- Change in design;
- Selection of material; - Change in environment; Corrosion prevention:- by using inhibitors - by using surface coating, linings and paints; Principles & Application of Cathodic and anodic protection; Determination of galvanic potential of different metals, Cathodic protection by sacrificial anode (lab test**).** Determination of Soil Resistivity, Corrosion Profiling, Mapping & Flaw detection by using Ultrasonic method, etc.

Training Methodology:

- Class-room lecture (Multimedia projector, Overhead projector etc.)
- Practical & Demonstration class
- Group Discussion
- Report preparation and presentation
- Case study

Evaluation system:

Attendance, Class participation & Overall performance

Course Advisor	**:**	Executive Director
Course Co-Advisor	**:**	Training Director
Course Director	**:**	Head of Operation & Process Technology Department
Course Coordinator	**:**	Md. Shahajahan Ali, Deputy Chief Chemist.

Course No.	**:**	**42**
Course Title	**:**	**Pumps: Operation & Operating Behavior**
Course Code	**:**	**PT – U104**
Duration	**:**	02 Weeks
Period	**:**	01 ~ 12 November, 2020
Nomination deadline	**:**	1~2 Weeks before commencing date
No. of Course	**:**	01
No. of Participants	**:**	20
Course fee	**:**	12,300/- Per Participant
Designed for	**:**	Technicians and Operators working in different Industries and other establishment

Course Brochure

Operation & Process Technology Department, TICI

Course Objectives:

- To develop the performance to do the job with more skill and more confidence in the field of pump operation.
- To acquaint constructional parts of pumps including their functions.
- To learn about characteristics, Standard operating procedure of pumps, Troubleshooting of pumps etc.
- To enhance knowledge about Measuring, Indicating & Control instruments including logic operation

Course Content:

Introduction, Working Principle and Classification of Pumps; Process symbols and process diagrams; Major Components of pumps and their functions; Pump Characteristics; Lubricants and Lubrication of Pump; Bearing and Seal system of Pump; Measuring, Indicating and Recording Instrument; Standard Operating Procedure (SOP) of pump; Selection of Pump; Troubleshooting of Pump; Sequential Logic Operation; ***Industrial safety;*** Lab practice on process symbols and process diagrams; a) Relation between Flow rate(Q) and Head (H) of centrifugal pump b) Effect of Speed(N) on Q~H curve of centrifugal pump; Speed(N) vs. Head (H) and Speed (N) vs. Capacity (Q) relations of centrifugal pump; c) Comparison of Energy consumption at constant delivery through different diameter pipelines d) Parallel and Series connection of two similar pumps; e) Influence of bubbles, suction head position etc. On pump capacity; f) Determination of Line characteristics at different Speed(N) and its effect on delivery; Determination of Density, Viscosity and Flash point of Lube oil;

Training Methodology:

- Class-room lecture
- Factory visit
- Practical & Demonstration class
- Case study

Evaluation system:

Attendance, Class participation & Overall performance

Course Advisor : Executive Director

Course Co-Advisor : Training Director

Course Director : Head of Operation & Process Technology Department

Course Coordinator : Abdullah Al Mehedi, Deputy Chief Chemist.

Course No. : **46**

Course Brochure

Operation & Process Technology Department, TICI

Course Title	:	**Process Simulation Using Aspen Plus Software**
Course Code	:	**PT- U336**
Duration	:	**1 Week**
Period	:	**28 November ~ 03 December, 2020**
Nomination deadline	:	**1~2 Weeks before commencing date**
No. of Course	:	**01**
No. of Participants	:	**20**
Course fee	:	**Tk. 7,800/- Per Participant**
Designed for	:	**Junior and mid-level officers working in different industries & other establishments.**

Course Objectives:

- To learn about Aspen Plus Software & Process Simulation.
- To learn Physical property estimation
- To learn heat exchanger design, Distillation & other Unit Processes using Aspen Plus

Course Content:

Introduction to Aspen plus, Aspen Plus start-up, Built-in function, Physical property estimation, Various flash calculations, Heat exchanger simulation, Basic distillation, Reactor modeling, Converting a process from steady-state to dynamic simulation *(Theory included in practice session).*

Training Methodology:

- Class-room lecture (Multimedia projector, Overhead projector etc.)
- Practical & Demonstration class
- Group Discussion
- Report preparation and presentation
- Case study

Evaluation system:

Attendance, Class participation & Overall performance

Course Advisor	:	Executive Director
Course Co-Advisor	:	Training Director
Course Director	:	Head of Operation & Process Technology Department
Course Coordinator	:	Md. Ashraf Ali, Deputy Chief Chemist

Course Brochure

Operation & Process Technology Department, TICI

Course No.	:	**01**
Course Title	:	**Industrial Process Unit Operation & Process Control Technique**
Course Code	:	**PT-S203**
Duration	:	4 Weeks.
Nomination deadline	:	1~2 Weeks before commencing date
No. of Course	:	02
No. of Participants	:	50
Course fee	:	Tk. 8,000/- Per Participant
Designed for	:	Student of ACCED. Dhaka University & CEPSD, SUST, PMED, SUST, ACCED, RU, ACCED, CU, ACCED, NSTU, ChED, JUST etc,

Course Objectives:

- To build up knowledge about Industrial instrumentation and control system of process units.
- To acquaint constructional components and functions of different equipment
- To enhance knowledge about operation control analysis
- To build up efficiency by operating and controlling pilot plants.

Course Content:

Introduction to process technology; Process symbols & process diagrams; Operation & control of industrial process units; Construction, operation & control system of industrial boilers, heat exchangers, pumps, compressors & turbine; Basic concept process plant design; Lubricants & Lubrication of industrial equipment; Measuring & control techniques of process parameters; Sensors; Transmitters; Controllers; Control valves; Programmable logic controller (PLC); Sequential logic control; Seal & Gasket; Bearing; Pipe fittings & Valves; Insulations & high temperature refractory; Introduction to Industrial safety; etc.

Practice on operation unit e. g. Water treatment plant, Ion exchange, Heat exchange unit, Pump arrangement, Flow assembly, Evaporation & Crystallization, Absorption & Neutralization. Programmable logic controller (PLC) and Sequential logic control. Demonstration on personal protective equipment and fire protection arrangement; Operation and application of Photometer & UV/Visible Spectrophotometer, Atomic Absorption & Spectrophotometer, Infrared Spectrophotometer, High Performance Liquid Chromatography, Gas Chromatography.

Training Methodology:

- Class-room lecture (Multimedia projector, Overhead projector etc.)
- Practical & Demonstration class
- Group Discussion, Report preparation and presentation

Evaluation system:

Written test, Attendance, Class participation & Overall performance

Course Advisor : Executive Director

Course Co-Advisor : Training Director

Course Director : Head of Operation & Process Technology Department

Course Coordinator : Teacher of OPTD